**********----------**********
Title: arkosite

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.37 (gm/cc)  viscosity = 4.58 (log 10 poise)  (analysis in wt %)
G = -1703270.80 (J)  H = -1264191.14 (J)  S = 279.11 (J/K)  V = 42.17 (cc)  Cp = 140.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.51 | 0.00 | 2.28 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.58 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.37 (gm/cc)
G = -1703270.80 (J)  H = -1264191.14 (J)  S = 279.11 (J/K)  V = 42.17 (cc)  Cp = 140.23 (J/K)

Oxygen  delta moles = 3.81639e-17  delta grams = 1.2212e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.37 (gm/cc)  viscosity = 4.64 (log 10 poise)  (analysis in wt %)
G = -1700485.29 (J)  H = -1265594.34 (J)  S = 278.21 (J/K)  V = 42.14 (cc)  Cp = 140.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.51 | 0.00 | 2.28 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.64 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.37 (gm/cc)
G = -1700485.29 (J)  H = -1265594.34 (J)  S = 278.21 (J/K)  V = 42.14 (cc)  Cp = 140.22 (J/K)

Oxygen  delta moles = 2.06131e-06  delta grams = 6.59595e-05
G = -0.75 (J)  H = 0.09 (J)  S = 0.00 (J/K)  V = 0.27 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.37 (gm/cc)  viscosity = 4.71 (log 10 poise)  (analysis in wt %)
G = -1697708.86 (J)  H = -1266997.58 (J)  S = 277.31 (J/K)  V = 42.11 (cc)  Cp = 140.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.51 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.37 (gm/cc)
G = -1697708.86 (J)  H = -1266997.58 (J)  S = 277.31 (J/K)  V = 42.11 (cc)  Cp = 140.22 (J/K)

Oxygen  delta moles = 4.33543e-06  delta grams = 0.000138729
G = -1.56 (J)  H = 0.18 (J)  S = 0.00 (J/K)  V = 0.56 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.38 (gm/cc)  viscosity = 4.77 (log 10 poise)  (analysis in wt %)
G = -1694941.57 (J)  H = -1268400.86 (J)  S = 276.41 (J/K)  V = 42.09 (cc)  Cp = 140.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.51 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.38 (gm/cc)
G = -1694941.57 (J)  H = -1268400.86 (J)  S = 276.41 (J/K)  V = 42.09 (cc)  Cp = 140.21 (J/K)

Oxygen  delta moles = 6.82838e-06  delta grams = 0.0002185
G = -2.44 (J)  H = 0.29 (J)  S = 0.00 (J/K)  V = 0.88 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.38 (gm/cc)  viscosity = 4.83 (log 10 poise)  (analysis in wt %)
G = -1692183.49 (J)  H = -1269804.18 (J)  S = 275.50 (J/K)  V = 42.06 (cc)  Cp = 140.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.51 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.38 (gm/cc)
G = -1692183.49 (J)  H = -1269804.18 (J)  S = 275.50 (J/K)  V = 42.06 (cc)  Cp = 140.20 (J/K)

Oxygen  delta moles = 9.54641e-06  delta grams = 0.000305474
G = -3.39 (J)  H = 0.40 (J)  S = 0.00 (J/K)  V = 1.22 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.38 (gm/cc)  viscosity = 4.90 (log 10 poise)  (analysis in wt %)
G = -1689434.67 (J)  H = -1271207.54 (J)  S = 274.58 (J/K)  V = 42.03 (cc)  Cp = 140.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.51 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.90 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.38 (gm/cc)
G = -1689434.67 (J)  H = -1271207.54 (J)  S = 274.58 (J/K)  V = 42.03 (cc)  Cp = 140.20 (J/K)

Oxygen  delta moles = 1.24961e-05  delta grams = 0.000399859
G = -4.40 (J)  H = 0.52 (J)  S = 0.00 (J/K)  V = 1.58 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.38 (gm/cc) viscosity = 4.96 (log 10 poise) (analysis in wt %)
G = -1686695.18 (J) H = -1272610.95 (J) S = 273.66 (J/K) V = 42.00 (cc) Cp = 140.19 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.27 0.40 12.72 0.51 0.00 2.27 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.96 (log 10 poise)

System mass = 100.00 (gm) density = 2.38 (gm/cc)
G = -1686695.18 (J) H = -1272610.95 (J) S = 273.66 (J/K) V = 42.00 (cc) Cp = 140.19 (J/K)

Oxygen delta moles = 1.56841e-05 delta grams = 0.000501874
G = -5.49 (J) H = 0.64 (J) S = 0.00 (J/K) V = 1.97 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.38 (gm/cc) viscosity = 5.03 (log 10 poise) (analysis in wt %)
G = -1683965.08 (J) H = -1274014.42 (J) S = 272.73 (J/K) V = 41.97 (cc) Cp = 140.19 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.27 0.40 12.72 0.51 0.00 2.27 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.03 (log 10 poise)

System mass = 100.00 (gm) density = 2.38 (gm/cc)
G = -1683965.08 (J) H = -1274014.42 (J) S = 272.73 (J/K) V = 41.97 (cc) Cp = 140.19 (J/K)

Oxygen delta moles = 1.91177e-05 delta grams = 0.000611744
G = -6.64 (J) H = 0.78 (J) S = 0.00 (J/K) V = 2.39 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1220.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.37 COH = 2.39 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.38 (gm/cc) viscosity = 5.10 (log 10 poise) (analysis in wt %)
G = -1681244.44 (J) H = -1275417.94 (J) S = 271.79 (J/K) V = 41.94 (cc) Cp = 140.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System mass = 100.00 (gm) density = 2.38 (gm/cc)
G = -1681244.44 (J) H = -1275417.94 (J) S = 271.79 (J/K) V = 41.94 (cc) Cp = 140.18 (J/K)

Oxygen delta moles = 2.28042e-05 delta grams = 0.000729708
G = -7.86 (J) H = 0.92 (J) S = 0.01 (J/K) V = 2.83 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1210.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.37 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.39 (gm/cc) viscosity = 5.17 (log 10 poise) (analysis in wt %)
G = -1678533.33 (J) H = -1276821.54 (J) S = 270.85 (J/K) V = 41.92 (cc) Cp = 140.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.17 (log 10 poise)

System mass = 100.00 (gm) density = 2.39 (gm/cc)
G = -1678533.33 (J) H = -1276821.54 (J) S = 270.85 (J/K) V = 41.92 (cc) Cp = 140.17 (J/K)

Oxygen delta moles = 2.67513e-05 delta grams = 0.000856011
G = -9.15 (J) H = 1.07 (J) S = 0.01 (J/K) V = 3.30 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1200.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.35 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.39 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -1675831.67 (J) H = -1278169.40 (J) S = 269.94 (J/K) V = 41.89 (cc) Cp = 132.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.24 (log 10 poise)

System mass = 100.00 (gm) density = 2.39 (gm/cc)
G = -1675831.67 (J) H = -1278169.40 (J) S = 269.94 (J/K) V = 41.89 (cc) Cp = 132.01 (J/K)

Oxygen delta moles = 3.09671e-05 delta grams = 0.000990911
G = -10.52 (J) H = 1.23 (J) S = 0.01 (J/K) V = 3.79 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1190.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.34 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.39 (gm/cc) viscosity = 5.31 (log 10 poise) (analysis in wt %)
G = -1673139.15 (J) H = -1279491.51 (J) S = 269.04 (J/K) V = 41.86 (cc) Cp = 131.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.39 (gm/cc)
G = -1673139.15 (J) H = -1279491.51 (J) S = 269.04 (J/K) V = 41.86 (cc) Cp = 131.99 (J/K)

Oxygen delta moles = 3.546e-05 delta grams = 0.00113468
G = -11.95 (J) H = 1.39 (J) S = 0.01 (J/K) V = 4.31 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.39 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1670455.80 (J) H = -1280813.50 (J) S = 268.14 (J/K) V = 41.83 (cc) Cp = 131.96 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.27 0.40 12.72 0.52 0.00 2.26 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.39 (gm/cc)
G = -1670455.80 (J) H = -1280813.50 (J) S = 268.14 (J/K) V = 41.83 (cc) Cp = 131.96 (J/K)

Oxygen delta moles = 4.02388e-05 delta grams = 0.00128759
G = -13.46 (J) H = 1.56 (J) S = 0.01 (J/K) V = 4.86 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1170.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.35 COH = 2.30 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.39 (gm/cc) viscosity = 5.45 (log 10 poise) (analysis in wt %)
G = -1667781.67 (J) H = -1282135.35 (J) S = 267.23 (J/K) V = 41.81 (cc) Cp = 131.93 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.27 0.40 12.72 0.52 0.00 2.26 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System mass = 100.00 (gm) density = 2.39 (gm/cc)
G = -1667781.67 (J) H = -1282135.35 (J) S = 267.23 (J/K) V = 41.81 (cc) Cp = 131.93 (J/K)

Oxygen delta moles = 4.53126e-05 delta grams = 0.00144995
G = -15.04 (J) H = 1.74 (J) S = 0.01 (J/K) V = 5.44 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1160.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.35 COH = 2.29 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.39 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -1665116.85 (J) H = -1283457.07 (J) S = 266.31 (J/K) V = 41.78 (cc) Cp = 131.90 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

73.27 0.40 12.72 0.52 0.00 2.26 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.39 (gm/cc)
G = -1665116.85 (J) H = -1283457.07 (J) S = 266.31 (J/K) V = 41.78 (cc) Cp = 131.90 (J/K)

Oxygen delta moles = 5.06909e-05 delta grams = 0.00162205
G = -16.69 (J) H = 1.93 (J) S = 0.01 (J/K) V = 6.04 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1150.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.34 COH = 2.27 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -1662461.39 (J) H = -1284778.64 (J) S = 265.39 (J/K) V = 41.75 (cc) Cp = 131.87 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.27 0.40 12.72 0.53 0.00 2.26 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.60 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1662461.39 (J) H = -1284778.64 (J) S = 265.39 (J/K) V = 41.75 (cc) Cp = 131.87 (J/K)

Oxygen delta moles = 5.6384e-05 delta grams = 0.00180422
G = -18.42 (J) H = 2.13 (J) S = 0.01 (J/K) V = 6.67 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1140.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.34 COH = 2.25 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1659815.37 (J) H = -1286100.05 (J) S = 264.46 (J/K) V = 41.72 (cc) Cp = 131.84 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.27 0.40 12.72 0.53 0.00 2.26 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.67 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1659815.37 (J) H = -1286100.05 (J) S = 264.46 (J/K) V = 41.72 (cc) Cp = 131.84 (J/K)

Oxygen delta moles = 6.24021e-05 delta grams = 0.00199679
G = -20.23 (J) H = 2.34 (J) S = 0.02 (J/K) V = 7.33 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1130.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.33 COH = 2.23 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -1657178.85 (J) H = -1287421.31 (J) S = 263.52 (J/K) V = 41.69 (cc) Cp = 131.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.53 | 0.00 | 2.26 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1657178.85 (J) H = -1287421.31 (J) S = 263.52 (J/K) V = 41.69 (cc) Cp = 131.81 (J/K)

Oxygen delta moles = 6.87563e-05 delta grams = 0.00220012
G = -22.11 (J) H = 2.55 (J) S = 0.02 (J/K) V = 8.02 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1120.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.22 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 5.83 (log 10 poise) (analysis in wt %)
G = -1654551.89 (J) H = -1288742.39 (J) S = 262.58 (J/K) V = 41.67 (cc) Cp = 131.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.53 | 0.00 | 2.25 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.40 (gm/cc)
G = -1654551.89 (J)  H = -1288742.39 (J)  S = 262.58 (J/K)  V = 41.67 (cc)  Cp = 131.77 (J/K)

Oxygen  delta moles = 7.54581e-05  delta grams = 0.00241457
G = -24.07 (J)  H = 2.77 (J)  S = 0.02 (J/K)  V = 8.74 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1110.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.20  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.40 (gm/cc)  viscosity = 5.90 (log 10 poise)  (analysis in wt %)
G = -1651934.59 (J)  H = -1290063.31 (J)  S = 261.63 (J/K)  V = 41.64 (cc)  Cp = 131.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.53 | 0.00 | 2.25 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.90 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.40 (gm/cc)
G = -1651934.59 (J)  H = -1290063.31 (J)  S = 261.63 (J/K)  V = 41.64 (cc)  Cp = 131.74 (J/K)

Oxygen  delta moles = 8.25193e-05  delta grams = 0.00264052
G = -26.12 (J)  H = 3.00 (J)  S = 0.02 (J/K)  V = 9.49 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1100.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.31  COH = 2.18  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.40 (gm/cc)  viscosity = 5.98 (log 10 poise)  (analysis in wt %)
G = -1649326.99 (J)  H = -1291384.04 (J)  S = 260.67 (J/K)  V = 41.61 (cc)  Cp = 131.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.54 | 0.00 | 2.25 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.98 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1649326.99 (J) H = -1291384.04 (J) S = 260.67 (J/K) V = 41.61 (cc) Cp = 131.70 (J/K)

Oxygen delta moles = 8.99527e-05 delta grams = 0.00287838
G = -28.24 (J) H = 3.24 (J) S = 0.02 (J/K) V = 10.27 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1090.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.16 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -1646729.19 (J) H = -1292704.59 (J) S = 259.71 (J/K) V = 41.58 (cc) Cp = 131.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.54 | 0.00 | 2.25 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.07 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1646729.19 (J) H = -1292704.59 (J) S = 259.71 (J/K) V = 41.58 (cc) Cp = 131.66 (J/K)

Oxygen delta moles = 9.77714e-05 delta grams = 0.00312857
G = -30.45 (J) H = 3.48 (J) S = 0.02 (J/K) V = 11.08 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1080.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.30 COH = 2.14 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 6.15 (log 10 poise) (analysis in wt %)
G = -1644141.24 (J) H = -1294024.94 (J) S = 258.74 (J/K) V = 41.56 (cc) Cp = 131.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.54 | 0.00 | 2.25 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.15 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1644141.24 (J) H = -1294024.94 (J) S = 258.74 (J/K) V = 41.56 (cc) Cp = 131.62 (J/K)

Oxygen delta moles = 0.000105989 delta grams = 0.00339152
G = -32.74 (J) H = 3.74 (J) S = 0.03 (J/K) V = 11.92 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1070.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.30 COH = 2.12 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -1641563.24 (J) H = -1295345.09 (J) S = 257.77 (J/K) V = 41.53 (cc) Cp = 131.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.55 | 0.00 | 2.24 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1641563.24 (J) H = -1295345.09 (J) S = 257.77 (J/K) V = 41.53 (cc) Cp = 131.58 (J/K)

Oxygen delta moles = 0.00011462 delta grams = 0.00366771
G = -35.11 (J) H = 4.00 (J) S = 0.03 (J/K) V = 12.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1060.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.29 COH = 2.10 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -1638995.25 (J) H = -1296665.04 (J) S = 256.78 (J/K) V = 41.50 (cc) Cp = 131.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.55 | 0.00 | 2.24 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.32 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1638995.25 (J) H = -1296665.04 (J) S = 256.78 (J/K) V = 41.50 (cc) Cp = 131.53 (J/K)

Oxygen delta moles = 0.00012368 delta grams = 0.00395762
G = -37.57 (J) H = 4.27 (J) S = 0.03 (J/K) V = 13.71 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1050.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.29 COH = 2.08 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 6.40 (log 10 poise) (analysis in wt %)
G = -1636437.35 (J) H = -1297984.77 (J) S = 255.79 (J/K) V = 41.47 (cc) Cp = 131.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.55 | 0.00 | 2.24 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.40 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1636437.35 (J) H = -1297984.77 (J) S = 255.79 (J/K) V = 41.47 (cc) Cp = 131.49 (J/K)

Oxygen delta moles = 0.000133185 delta grams = 0.00426176
G = -40.12 (J) H = 4.55 (J) S = 0.03 (J/K) V = 14.65 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1040.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.28 COH = 2.06 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 6.49 (log 10 poise) (analysis in wt %)
G = -1633889.62 (J) H = -1299304.28 (J) S = 254.80 (J/K) V = 41.45 (cc) Cp = 131.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.55 | 0.00 | 2.23 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.49 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1633889.62 (J) H = -1299304.28 (J) S = 254.80 (J/K) V = 41.45 (cc) Cp = 131.44 (J/K)

Oxygen delta moles = 0.000143151 delta grams = 0.00458065

G = -42.76 (J)  H = 4.84 (J)  S = 0.04 (J/K)  V = 15.63 (cc)  Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 1030.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.27  COH = 2.04  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.99 (gm)  density = 2.41 (gm/cc)  viscosity = 6.58 (log 10 poise)  (analysis in wt %)
G = -1631024.74 (J)  H = -1300356.05 (J)  S = 253.75 (J/K)  V = 41.41 (cc)  Cp = 131.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.56 | 0.00 | 2.23 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz  mass = 0.02 (gm)  density = 2.55 (gm/cc)
SiO2
G = -327.45 (J)  H = -270.40 (J)  S = 0.04 (J/K)  V = 0.01 (cc)  Cp = 0.02 (J/K)

Total solids  mass = 0.02 (gm)  density = 2.55 (gm/cc)
G = -327.45 (J)  H = -270.40 (J)  S = 0.04 (J/K)  V = 0.01 (cc)  Cp = 0.02 (J/K)

Viscosity of the System: 6.58 (log 10 poise)

System  mass = 100.01 (gm)  density = 2.41 (gm/cc)
G = -1631352.18 (J)  H = -1300626.45 (J)  S = 253.79 (J/K)  V = 41.42 (cc)  Cp = 131.39 (J/K)

Oxygen  delta moles = 0.000153656  delta grams = 0.0049168
G = -45.51 (J)  H = 5.14 (J)  S = 0.04 (J/K)  V = 16.65 (cc)  Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 1020.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.27  COH = 2.02  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.10 (gm)  density = 2.42 (gm/cc)  viscosity = 6.63 (log 10 poise)  (analysis in wt %)
G = -1613653.84 (J)  H = -1289518.36 (J)  S = 250.66 (J/K)  V = 41.00 (cc)  Cp = 130.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.03 | 0.40 | 12.84 | 0.57 | 0.00 | 2.25 | 0.06 | 0.49 | 0.00 | 0.00 | 1.16 | 2.70 | 5.43 | 0.06 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz  mass = 0.90 (gm)  density = 2.55 (gm/cc)
SiO2
G = -15173.22 (J)  H = -12557.38 (J)  S = 2.02 (J/K)  V = 0.35 (cc)  Cp = 1.08 (J/K)

Total solids  mass = 0.90 (gm)  density = 2.55 (gm/cc)
G = -15173.22 (J)  H = -12557.38 (J)  S = 2.02 (J/K)  V = 0.35 (cc)  Cp = 1.08 (J/K)

Viscosity of the System: 6.65 (log 10 poise)

System mass = 100.01 (gm) density = 2.42 (gm/cc)
G = -1628827.07 (J) H = -1302075.74 (J) S = 252.68 (J/K) V = 41.36 (cc) Cp = 131.32 (J/K)

Oxygen delta moles = 0.000167379 delta grams = 0.00535593
G = -49.15 (J) H = 5.54 (J) S = 0.04 (J/K) V = 18.00 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 1010.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.26 COH = 2.00 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 97.74 (gm) density = 2.42 (gm/cc) viscosity = 6.72 (log 10 poise) (analysis in wt %)
G = -1589693.86 (J) H = -1273504.02 (J) S = 246.42 (J/K) V = 40.44 (cc) Cp = 128.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.86 | 0.41 | 13.01 | 0.56 | 0.00 | 2.17 | 0.06 | 0.42 | 0.00 | 0.00 | 1.18 | 2.74 | 5.51 | 0.06 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.41 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg1.01Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -5627.62 (J) H = -4473.59 (J) S = 0.90 (J/K) V = 0.12 (cc) Cp = 0.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.39 | 97.70 | 90.55 | 3.07 | -2.96 | 5.78 | 0.25 |

quartz mass = 1.85 (gm) density = 2.55 (gm/cc)
SiO2
G = -30960.01 (J) H = -25678.65 (J) S = 4.12 (J/K) V = 0.72 (cc) Cp = 2.20 (J/K)

Total solids mass = 2.26 (gm) density = 2.68 (gm/cc)
G = -36587.62 (J) H = -30152.23 (J) S = 5.02 (J/K) V = 0.84 (cc) Cp = 2.67 (J/K)

Viscosity of the System: 6.76 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1626281.48 (J) H = -1303656.25 (J) S = 251.43 (J/K) V = 41.28 (cc) Cp = 131.13 (J/K)

Oxygen delta moles = 0.000120751 delta grams = 0.00386389
G = -35.15 (J) H = 3.95 (J) S = 0.03 (J/K) V = 12.88 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1000.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.25 COH = 1.98 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 96.56 (gm) density = 2.42 (gm/cc) viscosity = 6.80 (log 10 poise) (analysis in wt %)
G = -1568441.91 (J) H = -1259541.07 (J) S = 242.63 (J/K) V = 39.93 (cc) Cp = 126.91 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.68 0.42 13.16 0.55 0.00 2.12 0.06 0.38 0.00 0.00 1.19 2.77 5.58 0.06 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.70 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.94Mg0.97Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -9417.64 (J) H = -7495.37 (J) S = 1.51 (J/K) V = 0.20 (cc) Cp = 0.81 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-97.90 97.65 93.74 3.27 -3.16 6.14 0.26

quartz mass = 2.74 (gm) density = 2.55 (gm/cc)
SiO2
G = -45896.67 (J) H = -38150.47 (J) S = 6.08 (J/K) V = 1.08 (cc) Cp = 3.26 (J/K)

Total solids mass = 3.44 (gm) density = 2.70 (gm/cc)
G = -55314.32 (J) H = -45645.85 (J) S = 7.59 (J/K) V = 1.27 (cc) Cp = 4.06 (J/K)

Viscosity of the System: 6.86 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1623756.23 (J) H = -1305186.92 (J) S = 250.22 (J/K) V = 41.21 (cc) Cp = 130.97 (J/K)

Oxygen delta moles = 8.95295e-05 delta grams = 0.00286484
G = -25.84 (J) H = 2.90 (J) S = 0.02 (J/K) V = 9.48 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 990.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.25 COH = 1.96 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 95.41 (gm) density = 2.42 (gm/cc) viscosity = 6.88 (log 10 poise) (analysis in wt %)
G = -1547728.21 (J) H = -1245944.10 (J) S = 238.91 (J/K) V = 39.44 (cc) Cp = 125.40 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.50 0.42 13.31 0.54 0.00 2.06 0.06 0.34 0.00 0.00 1.20 2.81 5.64 0.06 1.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.98 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.97Mg0.94Fe'"0.03Ti0.00Al0.10Si1.93O6
G = -13101.87 (J) H = -10440.43 (J) S = 2.11 (J/K) V = 0.28 (cc) Cp = 1.13 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.40 97.60 96.90 3.49 -3.37 6.52 0.27

quartz mass = 3.62 (gm) density = 2.55 (gm/cc)
SiO2
G = -60411.79 (J) H = -50325.23 (J) S = 7.99 (J/K) V = 1.42 (cc) Cp = 4.29 (J/K)

Total solids mass = 4.59 (gm) density = 2.71 (gm/cc)
G = -73513.66 (J) H = -60765.66 (J) S = 10.09 (J/K) V = 1.69 (cc) Cp = 5.41 (J/K)

Viscosity of the System: 6.96 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1621241.87 (J) H = -1306709.76 (J) S = 249.01 (J/K) V = 41.14 (cc) Cp = 130.82 (J/K)

Oxygen delta moles = 5.59635e-05 delta grams = 0.00179076
G = -16.01 (J) H = 1.79 (J) S = 0.01 (J/K) V = 5.88 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 980.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.24 COH = 1.93 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 94.28 (gm) density = 2.42 (gm/cc) viscosity = 6.97 (log 10 poise) (analysis in wt %)
G = -1527527.05 (J) H = -1232694.34 (J) S = 235.27 (J/K) V = 38.96 (cc) Cp = 123.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.32 | 0.43 | 13.46 | 0.53 | 0.00 | 2.00 | 0.06 | 0.30 | 0.00 | 0.00 | 1.22 | 2.84 | 5.71 | 0.06 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.26 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.90Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -16688.34 (J) H = -13315.30 (J) S = 2.69 (J/K) V = 0.36 (cc) Cp = 1.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.85 | 97.55 | 99.99 | 3.72 | -3.60 | 6.92 | 0.28 |

quartz mass = 4.47 (gm) density = 2.55 (gm/cc)
SiO2
G = -74523.08 (J) H = -62215.41 (J) S = 9.82 (J/K) V = 1.75 (cc) Cp = 5.29 (J/K)

Total solids mass = 5.72 (gm) density = 2.72 (gm/cc)
G = -91211.42 (J) H = -75530.71 (J) S = 12.51 (J/K) V = 2.11 (cc) Cp = 6.73 (J/K)

Viscosity of the System: 7.06 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1618738.46 (J) H = -1308225.05 (J) S = 247.79 (J/K) V = 41.07 (cc) Cp = 130.66 (J/K)

Oxygen delta moles = 2.00655e-05 delta grams = 0.000642072
G = -5.69 (J) H = 0.64 (J) S = 0.01 (J/K) V = 2.09 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 970.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.24 COH = 1.91 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 89.32 (gm) density = 2.42 (gm/cc) viscosity = 7.01 (log 10 poise) (analysis in wt %)
G = -1444967.64 (J) H = -1168611.01 (J) S = 222.30 (J/K) V = 36.93 (cc) Cp = 117.39 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.17 0.45 13.52 0.53 0.00 1.97 0.07 0.27 0.00 0.00 1.22 2.76 5.87 0.07 1.12 0.00 0.00 0.00 0.00

orthopyroxene mass = 1.66 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.86Fe"'0.04Ti0.00Al0.11Si1.93O6
G = -21811.22 (J) H = -17414.82 (J) S = 3.54 (J/K) V = 0.47 (cc) Cp = 1.89 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-109.64 97.57 104.37 3.85 -3.72 7.30 0.27

feldspar mass = 2.92 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.28Na0.63Ca0.09Al1.09Si2.91O8
G = -48032.28 (J) H = -39590.09 (J) S = 6.79 (J/K) V = 1.15 (cc) Cp = 3.55 (J/K)
albite anorthite sanidine
63.12 8.74 28.14

quartz mass = 6.09 (gm) density = 2.55 (gm/cc)
SiO2
G = -101420.38 (J) H = -84854.16 (J) S = 13.33 (J/K) V = 2.39 (cc) Cp = 7.21 (J/K)

Total solids mass = 10.68 (gm) density = 2.67 (gm/cc)
G = -171263.88 (J) H = -141859.07 (J) S = 23.65 (J/K) V = 4.00 (cc) Cp = 12.65 (J/K)

Viscosity of the System: 7.20 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1616231.51 (J) H = -1310470.08 (J) S = 245.96 (J/K) V = 40.93 (cc) Cp = 130.04 (J/K)

Oxygen delta moles = -4.89012e-05 delta grams = -0.00156478
G = 13.74 (J) H = -1.53 (J) S = -0.01 (J/K) V = -5.05 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 960.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.23 COH = 1.89 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 81.81 (gm) density = 2.42 (gm/cc) viscosity = 7.01 (log 10 poise) (analysis in wt %)
G = -1321373.58 (J) H = -1070715.19 (J) S = 203.27 (J/K) V = 33.84 (cc) Cp = 107.51 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.00 0.49 13.53 0.53 0.00 1.97 0.07 0.23 0.00 0.00 1.26 2.63 5.98 0.07 1.23 0.00 0.00 0.00 0.00

orthopyroxene mass = 2.13 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.80Fe"'0.04Ti0.00Al0.12Si1.92O6
G = -27512.51 (J) H = -21978.22 (J) S = 4.49 (J/K) V = 0.59 (cc) Cp = 2.40 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-114.82 97.58 109.16 3.94 -3.80 7.69 0.26

feldspar mass = 7.90 (gm) density = 2.54 (gm/cc) (analysis in mole %)

K0.36Na0.58Ca0.07Al1.07Si2.93O8
G = -128959.81 (J) H = -106503.26 (J) S = 18.21 (J/K) V = 3.10 (cc) Cp = 9.54 (J/K)
albite anorthite sanidine
57.51 6.90 35.59

quartz mass = 8.17 (gm) density = 2.55 (gm/cc)
SiO2
G = -135888.54 (J) H = -113938.14 (J) S = 17.80 (J/K) V = 3.20 (cc) Cp = 9.66 (J/K)

Total solids mass = 18.19 (gm) density = 2.64 (gm/cc)
G = -292360.86 (J) H = -242419.62 (J) S = 40.50 (J/K) V = 6.90 (cc) Cp = 21.61 (J/K)

Viscosity of the System: 7.37 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1613734.44 (J) H = -1313134.81 (J) S = 243.77 (J/K) V = 40.74 (cc) Cp = 129.12 (J/K)

Oxygen delta moles = -0.000139162 delta grams = -0.00445302
G = 38.76 (J) H = -4.30 (J) S = -0.03 (J/K) V = -14.27 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 950.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.22 COH = 1.87 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 74.72 (gm) density = 2.42 (gm/cc) viscosity = 7.00 (log 10 poise) (analysis in wt %)
G = -1205475.17 (J) H = -978632.42 (J) S = 185.46 (J/K) V = 30.93 (cc) Cp = 98.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.84 | 0.54 | 13.55 | 0.54 | 0.00 | 1.96 | 0.08 | 0.21 | 0.00 | 0.00 | 1.31 | 2.53 | 6.03 | 0.08 | 1.34 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.56 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.76Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -32686.48 (J) H = -26131.65 (J) S = 5.36 (J/K) V = 0.71 (cc) Cp = 2.87 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-119.43 97.56 113.41 4.05 -3.89 8.06 0.25

feldspar mass = 12.62 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.40Na0.54Ca0.06Al1.06Si2.94O8
G = -205336.63 (J) H = -169952.66 (J) S = 28.93 (J/K) V = 4.97 (cc) Cp = 15.21 (J/K)
albite anorthite sanidine
54.11 6.19 39.71

quartz mass = 10.10 (gm) density = 2.55 (gm/cc)
SiO2
G = -167761.48 (J) H = -140966.07 (J) S = 21.91 (J/K) V = 3.96 (cc) Cp = 11.94 (J/K)

Total solids mass = 25.27 (gm) density = 2.62 (gm/cc)
G = -405784.58 (J) H = -337050.38 (J) S = 56.19 (J/K) V = 9.63 (cc) Cp = 30.01 (J/K)

Viscosity of the System: 7.56 (log 10 poise)

System mass = 99.99 (gm) density = 2.47 (gm/cc)
G = -1611259.76 (J) H = -1315682.80 (J) S = 241.65 (J/K) V = 40.56 (cc) Cp = 128.25 (J/K)

Oxygen delta moles = -0.000228089 delta grams = -0.00729857
G = 62.96 (J) H = -6.97 (J) S = -0.06 (J/K) V = -23.20 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 940.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.21 COH = 1.84 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 68.40 (gm) density = 2.41 (gm/cc) viscosity = 6.99 (log 10 poise) (analysis in wt %)
G = -1102349.27 (J) H = -896575.79 (J) S = 169.62 (J/K) V = 28.34 (cc) Cp = 89.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.68 | 0.59 | 13.56 | 0.53 | 0.00 | 1.94 | 0.09 | 0.18 | 0.00 | 0.00 | 1.36 | 2.45 | 6.06 | 0.09 | 1.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.95 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.17Mg0.72Fe'"0.04Ti0.00Al0.13Si1.91O6
G = -37335.36 (J) H = -29879.27 (J) S = 6.15 (J/K) V = 0.82 (cc) Cp = 3.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -123.46 | 97.53 | 117.13 | 4.15 | -3.98 | 8.38 | 0.25 |

feldspar mass = 16.82 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.42Na0.52Ca0.06Al1.06Si2.94O8
G = -273048.52 (J) H = -226508.73 (J) S = 38.36 (J/K) V = 6.62 (cc) Cp = 20.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 51.95 | 5.91 | 42.14 |

quartz mass = 11.81 (gm) density = 2.55 (gm/cc)
SiO2
G = -196074.58 (J) H = -165111.47 (J) S = 25.52 (J/K) V = 4.63 (cc) Cp = 13.96 (J/K)

Total solids mass = 31.59 (gm) density = 2.62 (gm/cc)
G = -506458.46 (J) H = -421499.47 (J) S = 70.03 (J/K) V = 12.07 (cc) Cp = 37.48 (J/K)

Viscosity of the System: 7.78 (log 10 poise)

System mass = 99.99 (gm) density = 2.47 (gm/cc)
G = -1608807.73 (J) H = -1318075.26 (J) S = 239.65 (J/K) V = 40.41 (cc) Cp = 127.46 (J/K)

Oxygen delta moles = -0.000313242 delta grams = -0.0100234
G = 85.68 (J) H = -9.47 (J) S = -0.08 (J/K) V = -31.60 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW

= 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 62.80 (gm) density = 2.41 (gm/cc) viscosity = 6.97 (log 10 poise) (analysis in wt %)
G = -1011287.06 (J) H = -824034.30 (J) S = 155.64 (J/K) V = 26.04 (cc) Cp = 82.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.53 | 0.64 | 13.58 | 0.53 | 0.00 | 1.91 | 0.10 | 0.16 | 0.00 | 0.00 | 1.41 | 2.37 | 6.08 | 0.10 | 1.60 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.32 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.20Mg0.68Fe'"0.05Ti0.00Al0.13Si1.91O6
G = -41500.99 (J) H = -33255.77 (J) S = 6.85 (J/K) V = 0.91 (cc) Cp = 3.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -126.95 | 97.49 | 120.36 | 4.25 | -4.06 | 8.66 | 0.24 |

feldspar mass = 20.53 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.44Na0.50Ca0.06Al1.06Si2.94O8
G = -332489.90 (J) H = -276449.89 (J) S = 46.58 (J/K) V = 8.08 (cc) Cp = 24.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 50.41 | 5.81 | 43.78 |

quartz mass = 13.34 (gm) density = 2.55 (gm/cc)
SiO2
G = -221099.71 (J) H = -186584.38 (J) S = 28.69 (J/K) V = 5.23 (cc) Cp = 15.74 (J/K)

Total solids mass = 37.19 (gm) density = 2.61 (gm/cc)
G = -595090.60 (J) H = -496290.04 (J) S = 82.12 (J/K) V = 14.23 (cc) Cp = 44.08 (J/K)

Viscosity of the System: 8.04 (log 10 poise)

System mass = 99.99 (gm) density = 2.48 (gm/cc)
G = -1606377.66 (J) H = -1320324.34 (J) S = 237.75 (J/K) V = 40.27 (cc) Cp = 126.74 (J/K)

Oxygen delta moles = -0.000393887 delta grams = -0.0126039
G = 106.75 (J) H = -11.76 (J) S = -0.10 (J/K) V = -39.40 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 920.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.20 COH = 1.79 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 56.77 (gm) density = 2.40 (gm/cc) viscosity = 6.97 (log 10 poise) (analysis in wt %)
G = -915659.82 (J) H = -747724.73 (J) S = 140.75 (J/K) V = 23.62 (cc) Cp = 74.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.64 | 0.58 | 13.67 | 0.45 | 0.00 | 1.61 | 0.11 | 0.18 | 0.00 | 0.00 | 1.46 | 2.30 | 6.13 | 0.11 | 1.77 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.91 (gm) density = 3.61 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.14Mg0.75Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -36973.05 (J) H = -29803.06 (J) S = 6.01 (J/K) V = 0.81 (cc) Cp = 3.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -119.31 | 97.30 | 113.73 | 4.24 | -4.07 | 7.86 | 0.24 |

feldspar mass = 22.57 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.47Na0.48Ca0.05Al1.05Si2.95O8
G = -364439.73 (J) H = -303699.70 (J) S = 50.91 (J/K) V = 8.89 (cc) Cp = 27.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 47.78 | 5.36 | 46.87 |

feldspar mass = 1.78 (gm) density = 2.57 (gm/cc) (analysis in mole %)
K0.20Na0.65Ca0.15Al1.15Si2.85O8
G = -29135.57 (J) H = -24313.89 (J) S = 4.04 (J/K) V = 0.69 (cc) Cp = 2.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.00 | 14.76 | 20.24 |

quartz mass = 15.30 (gm) density = 2.55 (gm/cc)
SiO2
G = -253249.39 (J) H = -214172.76 (J) S = 32.75 (J/K) V = 6.00 (cc) Cp = 18.04 (J/K)

spinel mass = 0.69 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.24Mg0.06Fe'"1.29Al0.13Cr0.00Ti0.29O4
G = -4932.68 (J) H = -3361.21 (J) S = 1.32 (J/K) V = 0.14 (cc) Cp = 0.62 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.48 | 64.31 | 5.83 | 29.38 |

Total solids mass = 43.24 (gm) density = 2.62 (gm/cc)
G = -688730.42 (J) H = -575350.63 (J) S = 95.03 (J/K) V = 16.53 (cc) Cp = 51.11 (J/K)

Viscosity of the System: 8.48 (log 10 poise)

System mass = 100.01 (gm) density = 2.49 (gm/cc)
G = -1604390.24 (J) H = -1323075.35 (J) S = 235.77 (J/K) V = 40.15 (cc) Cp = 125.94 (J/K)

Oxygen delta moles = 0.000316463 delta grams = 0.0101264
G = -84.98 (J) H = 9.34 (J) S = 0.08 (J/K) V = 31.39 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 910.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.19 COH = 1.77 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 52.10 (gm) density = 2.40 (gm/cc) viscosity = 6.95 (log 10 poise) (analysis in wt %)
G = -840391.93 (J) H = -687544.04 (J) S = 129.19 (J/K) V = 21.73 (cc) Cp = 68.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.58 | 0.58 | 13.69 | 0.43 | 0.00 | 1.50 | 0.12 | 0.18 | 0.00 | 0.00 | 1.49 | 2.25 | 6.15 | 0.12 | 1.92 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.95 (gm) density = 3.60 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.13Mg0.76Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -37507.14 (J) H = -30325.23 (J) S = 6.07 (J/K) V = 0.82 (cc) Cp = 3.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.59 | 97.26 | 113.19 | 4.30 | -4.12 | 7.73 | 0.23 |

feldspar mass = 23.76 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.50Na0.45Ca0.05Al1.05Si2.95O8
G = -382485.80 (J) H = -319458.79 (J) S = 53.27 (J/K) V = 9.37 (cc) Cp = 28.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.20 | 4.80 | 50.00 |

feldspar mass = 3.62 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.18Na0.66Ca0.16Al1.16Si2.84O8
G = -59308.49 (J) H = -49618.48 (J) S = 8.19 (J/K) V = 1.40 (cc) Cp = 4.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.60 | 16.27 | 18.12 |

quartz mass = 16.70 (gm) density = 2.55 (gm/cc)
SiO2
G = -276086.54 (J) H = -233984.60 (J) S = 35.58 (J/K) V = 6.55 (cc) Cp = 19.67 (J/K)

spinel mass = 0.88 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.25Mg0.06Fe'"1.27Al0.12Cr0.00Ti0.30O4
G = -6342.16 (J) H = -4343.38 (J) S = 1.69 (J/K) V = 0.18 (cc) Cp = 0.79 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.29 | 63.48 | 5.83 | 30.40 |

Total solids mass = 47.91 (gm) density = 2.62 (gm/cc)
G = -761730.14 (J) H = -637730.47 (J) S = 104.80 (J/K) V = 18.32 (cc) Cp = 56.57 (J/K)

Viscosity of the System: 9.09 (log 10 poise)

System mass = 100.02 (gm) density = 2.50 (gm/cc)
G = -1602122.07 (J) H = -1325274.51 (J) S = 233.99 (J/K) V = 40.04 (cc) Cp = 125.30 (J/K)

Oxygen delta moles = 0.000468265 delta grams = 0.0149839
G = -124.57 (J) H = 13.65 (J) S = 0.12 (J/K) V = 46.06 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 900.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.19 COH = 1.74 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 47.95 (gm) density = 2.39 (gm/cc) viscosity = 6.93 (log 10 poise) (analysis in wt %)
G = -773376.58 (J) H = -633865.84 (J) S = 118.92 (J/K) V = 20.03 (cc) Cp = 63.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.51 | 0.59 | 13.72 | 0.40 | 0.00 | 1.39 | 0.13 | 0.17 | 0.00 | 0.00 | 1.51 | 2.21 | 6.16 | 0.13 | 2.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.98 (gm) density = 3.60 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.13Mg0.77Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -37907.31 (J) H = -30741.32 (J) S = 6.11 (J/K) V = 0.83 (cc) Cp = 3.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.89 | 97.24 | 112.64 | 4.35 | -4.16 | 7.60 | 0.23 |

feldspar mass = 25.05 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.53Na0.43Ca0.04Al1.04Si2.96O8
G = -402150.31 (J) H = -336647.14 (J) S = 55.84 (J/K) V = 9.88 (cc) Cp = 29.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 43.07 | 4.37 | 52.56 |

feldspar mass = 5.03 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.17Na0.66Ca0.18Al1.18Si2.82O8
G = -82382.71 (J) H = -69093.38 (J) S = 11.33 (J/K) V = 1.95 (cc) Cp = 6.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.95 | 17.54 | 16.51 |

quartz mass = 17.96 (gm) density = 2.55 (gm/cc)
SiO2
G = -296491.85 (J) H = -251813.18 (J) S = 38.08 (J/K) V = 7.04 (cc) Cp = 21.14 (J/K)

spinel mass = 1.05 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.26Mg0.06Fe'"1.25Al0.12Cr0.00Ti0.31O4
G = -7546.56 (J) H = -5194.24 (J) S = 2.01 (J/K) V = 0.22 (cc) Cp = 0.94 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.09 | 62.63 | 5.84 | 31.44 |

Total solids mass = 52.07 (gm) density = 2.62 (gm/cc)
G = -826478.74 (J) H = -693489.26 (J) S = 113.36 (J/K) V = 19.91 (cc) Cp = 61.41 (J/K)

Viscosity of the System: 11.96 (log 10 poise)

System mass = 100.02 (gm) density = 2.50 (gm/cc)
G = -1599855.31 (J) H = -1327355.10 (J) S = 232.28 (J/K) V = 39.95 (cc) Cp = 124.73 (J/K)

Oxygen delta moles = 0.000590017 delta grams = 0.0188798
G = -155.49 (J) H = 16.99 (J) S = 0.15 (J/K) V = 57.55 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 890.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.18 COH = 1.72 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 44.23 (gm) density = 2.39 (gm/cc) viscosity = 6.89 (log 10 poise) (analysis in wt %)
G = -713365.52 (J) H = -585710.74 (J) S = 109.75 (J/K) V = 18.52 (cc) Cp = 58.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.43 | 0.59 | 13.74 | 0.38 | 0.00 | 1.30 | 0.14 | 0.17 | 0.00 | 0.00 | 1.53 | 2.18 | 6.16 | 0.14 | 2.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.00 (gm) density = 3.60 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.12Mg0.77Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -38201.23 (J) H = -31072.76 (J) S = 6.13 (J/K) V = 0.83 (cc) Cp = 3.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.21 | 97.23 | 112.09 | 4.40 | -4.21 | 7.48 | 0.23 |

feldspar mass = 26.29 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.55Na0.41Ca0.04Al1.04Si2.96O8
G = -420964.51 (J) H = -353200.43 (J) S = 58.26 (J/K) V = 10.37 (cc) Cp = 31.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.25 | 4.02 | 54.74 |

feldspar mass = 6.21 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.15Na0.66Ca0.19Al1.19Si2.81O8
G = -101651.24 (J) H = -85461.42 (J) S = 13.92 (J/K) V = 2.40 (cc) Cp = 7.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.17 | 18.62 | 15.21 |

quartz mass = 19.09 (gm) density = 2.55 (gm/cc)
SiO2
G = -314826.59 (J) H = -267952.74 (J) S = 40.30 (J/K) V = 7.48 (cc) Cp = 22.45 (J/K)

spinel mass = 1.20 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.27Mg0.06Fe'"1.24Al0.11Cr0.00Ti0.32O4
G = -8583.19 (J) H = -5937.53 (J) S = 2.27 (J/K) V = 0.25 (cc) Cp = 1.07 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -0.10 | 61.76 | 5.84 | 32.50 |

Total solids mass = 55.80 (gm) density = 2.61 (gm/cc)
G = -884226.75 (J) H = -743624.87 (J) S = 120.88 (J/K) V = 21.34 (cc) Cp = 65.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.51 (gm/cc)
G = -1597592.28 (J) H = -1329335.61 (J) S = 230.63 (J/K) V = 39.86 (cc) Cp = 124.20 (J/K)

Oxygen delta moles = 0.000687234 delta grams = 0.0219907
G = -179.40 (J) H = 19.54 (J) S = 0.17 (J/K) V = 66.46 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 880.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.17 COH = 1.69 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 40.88 (gm) density = 2.38 (gm/cc) viscosity = 6.85 (log 10 poise) (analysis in wt %)
G = -659330.17 (J) H = -542270.37 (J) S = 101.51 (J/K) V = 17.15 (cc) Cp = 54.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.34 | 0.59 | 13.76 | 0.36 | 0.00 | 1.21 | 0.15 | 0.16 | 0.00 | 0.00 | 1.54 | 2.15 | 6.15 | 0.15 | 2.45 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.02 (gm) density = 3.60 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.12Mg0.78Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -38411.29 (J) H = -31336.94 (J) S = 6.13 (J/K) V = 0.84 (cc) Cp = 3.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.56 | 97.23 | 111.54 | 4.45 | -4.26 | 7.37 | 0.22 |

feldspar mass = 27.44 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.57Na0.40Ca0.04Al1.04Si2.96O8
G = -438306.26 (J) H = -368589.46 (J) S = 60.46 (J/K) V = 10.83 (cc) Cp = 32.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 39.65 | 3.71 | 56.64 |

feldspar mass = 7.24 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.14Na0.66Ca0.20Al1.20Si2.80O8
G = -118414.94 (J) H = -99794.63 (J) S = 16.15 (J/K) V = 2.80 (cc) Cp = 8.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.32 | 19.56 | 14.12 |

quartz mass = 20.12 (gm) density = 2.55 (gm/cc)
SiO2
G = -331390.98 (J) H = -282648.04 (J) S = 42.27 (J/K) V = 7.89 (cc) Cp = 23.64 (J/K)

spinel mass = 1.32 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.28Mg0.06Fe'"1.22Al0.11Cr0.00Ti0.34O4
G = -9481.11 (J) H = -6591.73 (J) S = 2.51 (J/K) V = 0.27 (cc) Cp = 1.19 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -0.29 | 60.89 | 5.85 | 33.55 |

Total solids mass = 59.15 (gm) density = 2.61 (gm/cc)
G = -936004.58 (J) H = -788960.80 (J) S = 127.51 (J/K) V = 22.62 (cc) Cp = 69.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.51 (gm/cc)
G = -1595334.75 (J) H = -1331231.16 (J) S = 229.03 (J/K) V = 39.78 (cc) Cp = 123.71 (J/K)

Oxygen delta moles = 0.000764268 delta grams = 0.0244557
G = -197.61 (J) H = 21.46 (J) S = 0.19 (J/K) V = 73.28 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: akosite

T = 870.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.16 COH = 1.66 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 37.85 (gm) density = 2.38 (gm/cc) viscosity = 6.80 (log 10 poise) (analysis in wt %)
G = -610417.57 (J) H = -502873.32 (J) S = 94.08 (J/K) V = 15.91 (cc) Cp = 50.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.23 | 0.59 | 13.78 | 0.34 | 0.00 | 1.13 | 0.16 | 0.16 | 0.00 | 0.00 | 1.54 | 2.14 | 6.13 | 0.16 | 2.65 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.03 (gm) density = 3.60 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.11Mg0.79Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -38555.76 (J) H = -31548.10 (J) S = 6.13 (J/K) V = 0.84 (cc) Cp = 3.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.94 | 97.25 | 111.00 | 4.50 | -4.31 | 7.26 | 0.22 |

feldspar mass = 28.49 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.58Na0.38Ca0.03Al1.03Si2.97O8
G = -454072.06 (J) H = -382717.91 (J) S = 62.42 (J/K) V = 11.25 (cc) Cp = 33.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.22 | 3.45 | 58.34 |

feldspar mass = 8.16 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.13Na0.66Ca0.20Al1.20Si2.80O8
G = -133339.53 (J) H = -112639.60 (J) S = 18.11 (J/K) V = 3.15 (cc) Cp = 9.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.43 | 20.38 | 13.18 |

quartz mass = 21.06 (gm) density = 2.55 (gm/cc)
SiO2
G = -346436.06 (J) H = -296103.98 (J) S = 44.03 (J/K) V = 8.26 (cc) Cp = 24.72 (J/K)

spinel mass = 1.44 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.29Mg0.06Fe'"1.20Al0.11Cr0.00Ti0.35O4
G = -10263.16 (J) H = -7171.33 (J) S = 2.70 (J/K) V = 0.29 (cc) Cp = 1.28 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -0.48 | 60.01 | 5.86 | 34.61 |

Total solids mass = 62.18 (gm) density = 2.61 (gm/cc)
G = -982666.56 (J) H = -830180.92 (J) S = 133.39 (J/K) V = 23.79 (cc) Cp = 73.12 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.03 (gm) density = 2.52 (gm/cc)
G = -1593084.13 (J) H = -1333054.24 (J) S = 227.47 (J/K) V = 39.70 (cc) Cp = 123.26 (J/K)

Oxygen delta moles = 0.000824583 delta grams = 0.0263857
G = -211.15 (J) H = 22.87 (J) S = 0.20 (J/K) V = 78.37 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: akosite

T = 860.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.64 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 34.99 (gm) density = 2.37 (gm/cc) viscosity = 6.73 (log 10 poise) (analysis in wt %)
G = -564373.43 (J) H = -465662.48 (J) S = 87.11 (J/K) V = 14.75 (cc) Cp = 46.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.13 | 0.55 | 13.80 | 0.32 | 0.00 | 1.07 | 0.17 | 0.15 | 0.00 | 0.00 | 1.55 | 2.13 | 6.09 | 0.17 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.11 (gm) density = 3.60 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.12Mg0.78Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -39403.77 (J) H = -32320.13 (J) S = 6.25 (J/K) V = 0.86 (cc) Cp = 3.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.75 | 97.31 | 111.73 | 4.59 | -4.40 | 7.30 | 0.21 |

feldspar mass = 29.52 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.60Na0.37Ca0.03Al1.03Si2.97O8
G = -469432.14 (J) H = -396565.36 (J) S = 64.30 (J/K) V = 11.65 (cc) Cp = 35.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.87 | 3.21 | 59.92 |

feldspar mass = 8.98 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.67Ca0.21Al1.21Si2.79O8
G = -146602.24 (J) H = -124135.82 (J) S = 19.83 (J/K) V = 3.46 (cc) Cp = 10.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.50 | 21.16 | 12.34 |

quartz mass = 21.92 (gm) density = 2.55 (gm/cc)
SiO2
G = -360113.07 (J) H = -308441.80 (J) S = 45.60 (J/K) V = 8.59 (cc) Cp = 25.70 (J/K)

spinel mass = 1.43 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.28Mg0.06Fe'"1.21Al0.11Cr0.00Ti0.34O4
G = -10143.97 (J) H = -7113.41 (J) S = 2.67 (J/K) V = 0.29 (cc) Cp = 1.27 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -0.33 | 60.60 | 5.66 | 34.07 |

rhm-oxide mass = 0.08 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.74Mg0.08Fe'"0.22Al0.09Ti0.85O3
G = -743.76 (J) H = -580.56 (J) S = 0.14 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.30 | 10.86 | 73.83 | 2.40 | 4.61 |

Total solids mass = 65.03 (gm) density = 2.61 (gm/cc)
G = -1026438.96 (J) H = -869157.08 (J) S = 138.80 (J/K) V = 24.88 (cc) Cp = 76.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.03 (gm) density = 2.52 (gm/cc)
G = -1590812.39 (J) H = -1334819.56 (J) S = 225.91 (J/K) V = 39.63 (cc) Cp = 122.83 (J/K)

Oxygen delta moles = 0.000815493 delta grams = 0.0260948
G = -206.80 (J) H = 22.32 (J) S = 0.20 (J/K) V = 76.83 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: akosite

T = 850.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.61 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 32.38 (gm) density = 2.37 (gm/cc) viscosity = 6.66 (log 10 poise) (analysis in wt %)
G = -522264.39 (J) H = -431558.36 (J) S = 80.76 (J/K) V = 13.68 (cc) Cp = 43.02 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.01 0.50 13.82 0.31 0.00 1.03 0.18 0.14 0.00 0.00 1.55 2.14 6.04 0.19 3.10 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.19 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.77Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -40316.65 (J) H = -33146.42 (J) S = 6.38 (J/K) V = 0.88 (cc) Cp = 3.55 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-117.79 97.38 112.65 4.68 -4.50 7.36 0.21

feldspar mass = 30.45 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.03Al1.03Si2.97O8
G = -483299.55 (J) H = -409208.37 (J) S = 65.97 (J/K) V = 12.02 (cc) Cp = 36.10 (J/K)
albite anorthite sanidine
35.64 2.99 61.37

feldspar mass = 9.73 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.67Ca0.22Al1.22Si2.78O8
G = -158699.50 (J) H = -134693.51 (J) S = 21.37 (J/K) V = 3.75 (cc) Cp = 11.76 (J/K)
albite anorthite sanidine
66.57 21.84 11.60

quartz mass = 22.71 (gm) density = 2.55 (gm/cc)
SiO2
G = -372584.07 (J) H = -319793.11 (J) S = 47.00 (J/K) V = 8.90 (cc) Cp = 26.60 (J/K)

spinel mass = 1.40 (gm) density = 4.89 (gm/cc) (analysis in mole %)
Fe"1.28Mg0.05Fe'"1.23Al0.11Cr0.00Ti0.33O4
G = -9878.37 (J) H = -6950.61 (J) S = 2.61 (J/K) V = 0.29 (cc) Cp = 1.25 (J/K)
chromite hercynite magnetite spinel ulvospinel
0.00 -0.13 61.42 5.43 33.28

rhm-oxide mass = 0.16 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.74Mg0.08Fe'"0.21Al0.09Ti0.85O3
G = -1506.37 (J) H = -1179.54 (J) S = 0.29 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.11 10.71 74.14 2.47 4.56

Total solids mass = 67.64 (gm) density = 2.61 (gm/cc)
G = -1066284.50 (J) H = -904971.55 (J) S = 143.63 (J/K) V = 25.87 (cc) Cp = 79.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.03 (gm) density = 2.53 (gm/cc)
G = -1588548.89 (J) H = -1336529.91 (J) S = 224.39 (J/K) V = 39.56 (cc) Cp = 122.43 (J/K)

Oxygen delta moles = 0.00079278 delta grams = 0.025368
G = -199.08 (J) H = 21.42 (J) S = 0.20 (J/K) V = 74.03 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: akosite

T = 840.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.14 COH = 1.58 IW

= 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 30.00 (gm) density = 2.36 (gm/cc) viscosity = 6.58 (log 10 poise) (analysis in wt %)
G = -483785.99 (J) H = -400331.41 (J) S = 74.97 (J/K) V = 12.70 (cc) Cp = 39.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.87 | 0.46 | 13.84 | 0.30 | 0.00 | 0.98 | 0.19 | 0.14 | 0.00 | 0.00 | 1.55 | 2.15 | 5.98 | 0.20 | 3.34 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.27 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.76Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -41187.71 (J) H = -33941.99 (J) S = 6.51 (J/K) V = 0.91 (cc) Cp = 3.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.84 | 97.46 | 113.57 | 4.78 | -4.61 | 7.43 | 0.20 |

feldspar mass = 31.30 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.03Al1.03Si2.97O8
G = -495672.97 (J) H = -420636.92 (J) S = 67.41 (J/K) V = 12.36 (cc) Cp = 37.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.52 | 2.79 | 62.69 |

feldspar mass = 10.43 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.67Ca0.22Al1.22Si2.78O8
G = -169854.82 (J) H = -144495.55 (J) S = 22.78 (J/K) V = 4.01 (cc) Cp = 12.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.64 | 22.42 | 10.94 |

quartz mass = 23.44 (gm) density = 2.55 (gm/cc)
SiO2
G = -384018.50 (J) H = -330297.06 (J) S = 48.26 (J/K) V = 9.19 (cc) Cp = 27.42 (J/K)

spinel mass = 1.37 (gm) density = 4.89 (gm/cc) (analysis in mole %)
Fe"1.27Mg0.05Fe'"1.24Al0.11Cr0.00Ti0.33O4
G = -9598.46 (J) H = -6776.71 (J) S = 2.53 (J/K) V = 0.28 (cc) Cp = 1.22 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.05 | 62.23 | 5.21 | 32.50 |

rhm-oxide mass = 0.23 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.08Fe'"0.21Al0.09Ti0.85O3
G = -2179.91 (J) H = -1712.31 (J) S = 0.42 (J/K) V = 0.05 (cc) Cp = 0.21 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.93 | 10.56 | 74.47 | 2.53 | 4.51 |

Total solids mass = 70.03 (gm) density = 2.61 (gm/cc)
G = -1102512.37 (J) H = -937860.54 (J) S = 147.92 (J/K) V = 26.79 (cc) Cp = 82.14 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.53 (gm/cc)
G = -1586298.36 (J) H = -1338191.95 (J) S = 222.89 (J/K) V = 39.49 (cc) Cp = 122.06 (J/K)

Oxygen delta moles = 0.000765935 delta grams = 0.024509

G = -190.44 (J)  H = 20.43 (J)  S = 0.19 (J/K)  V = 70.89 (cc)  Cp = 0.03 (J/K)

**********----------**********
Title: akosite

T = 830.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -13.24  delta HM = -5.10  NNO = 0.00  QFM = 0.13  COH = 1.55  IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid  mass = 27.81 (gm)  density = 2.36 (gm/cc)  viscosity = 6.49 (log 10 poise)  (analysis in wt %)
G = -448450.45 (J)  H = -371593.87 (J)  S = 69.67 (J/K)  V = 11.81 (cc)  Cp = 37.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.70 | 0.42 | 13.86 | 0.30 | 0.00 | 0.94 | 0.20 | 0.13 | 0.00 | 0.00 | 1.55 | 2.16 | 5.92 | 0.22 | 3.61 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.35 (gm)  density = 3.62 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.75Fe'''0.03Ti0.00Al0.13Si1.92O6
G = -42024.99 (J)  H = -34713.27 (J)  S = 6.63 (J/K)  V = 0.93 (cc)  Cp = 3.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -119.91 | 97.55 | 114.49 | 4.89 | -4.73 | 7.51 | 0.20 |

feldspar  mass = 32.06 (gm)  density = 2.53 (gm/cc)  (analysis in mole %)
K0.64Na0.33Ca0.03Al1.03Si2.97O8
G = -506731.03 (J)  H = -430994.13 (J)  S = 68.66 (J/K)  V = 12.66 (cc)  Cp = 37.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.47 | 2.61 | 63.92 |

feldspar  mass = 11.08 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.10Na0.67Ca0.23Al1.23Si2.77O8
G = -180210.76 (J)  H = -153657.78 (J)  S = 24.07 (J/K)  V = 4.26 (cc)  Cp = 13.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.72 | 22.93 | 10.34 |

quartz  mass = 24.11 (gm)  density = 2.55 (gm/cc)
SiO2
G = -394559.97 (J)  H = -340071.74 (J)  S = 49.39 (J/K)  V = 9.45 (cc)  Cp = 28.18 (J/K)

spinel  mass = 1.33 (gm)  density = 4.90 (gm/cc)  (analysis in mole %)
Fe"1.27Mg0.05Fe'''1.26Al0.10Cr0.00Ti0.32O4
G = -9307.67 (J)  H = -6594.05 (J)  S = 2.46 (J/K)  V = 0.27 (cc)  Cp = 1.19 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.23 | 63.04 | 5.00 | 31.73 |

rhm-oxide  mass = 0.29 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'''0.21Al0.09Ti0.85O3
G = -2775.89 (J)  H = -2187.28 (J)  S = 0.53 (J/K)  V = 0.06 (cc)  Cp = 0.27 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.74 | 10.41 | 74.80 | 2.59 | 4.46 |

Total solids  mass = 72.22 (gm)  density = 2.61 (gm/cc)
G = -1135610.29 (J)  H = -968218.25 (J)  S = 151.74 (J/K)  V = 27.62 (cc)  Cp = 84.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.54 (gm/cc)
G = -1584060.74 (J) H = -1339812.12 (J) S = 221.41 (J/K) V = 39.43 (cc) Cp = 121.71 (J/K)

Oxygen delta moles = 0.000735322 delta grams = 0.0235294
G = -181.01 (J) H = 19.35 (J) S = 0.18 (J/K) V = 67.44 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: akosite

T = 820.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.12 COH = 1.52 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 25.78 (gm) density = 2.35 (gm/cc) viscosity = 6.39 (log 10 poise) (analysis in wt %)
G = -415836.22 (J) H = -345009.74 (J) S = 64.79 (J/K) V = 10.98 (cc) Cp = 34.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.51 | 0.38 | 13.88 | 0.29 | 0.00 | 0.90 | 0.22 | 0.12 | 0.00 | 0.00 | 1.55 | 2.19 | 5.84 | 0.23 | 3.89 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.43 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.15Mg0.74Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -42835.44 (J) H = -35465.84 (J) S = 6.74 (J/K) V = 0.95 (cc) Cp = 3.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -120.99 | 97.65 | 115.40 | 5.01 | -4.85 | 7.59 | 0.19 |

feldspar mass = 32.75 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.02Al1.02Si2.98O8
G = -516636.69 (J) H = -440411.24 (J) S = 69.73 (J/K) V = 12.93 (cc) Cp = 38.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.50 | 2.44 | 65.07 |

feldspar mass = 11.68 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.67Ca0.23Al1.23Si2.77O8
G = -189880.70 (J) H = -162272.32 (J) S = 25.26 (J/K) V = 4.49 (cc) Cp = 14.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.83 | 23.37 | 9.80 |

quartz mass = 24.74 (gm) density = 2.55 (gm/cc)
SiO2
G = -404334.16 (J) H = -349220.79 (J) S = 50.42 (J/K) V = 9.70 (cc) Cp = 28.88 (J/K)

spinel mass = 1.30 (gm) density = 4.91 (gm/cc) (analysis in mole %)
Fe"1.26Mg0.05Fe'"1.28Al0.10Cr0.00Ti0.31O4
G = -9008.53 (J) H = -6404.30 (J) S = 2.38 (J/K) V = 0.26 (cc) Cp = 1.16 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.41 | 63.84 | 4.79 | 30.96 |

rhm-oxide mass = 0.35 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.21Al0.09Ti0.85O3
G = -3304.25 (J) H = -2611.78 (J) S = 0.63 (J/K) V = 0.07 (cc) Cp = 0.32 (J/K)

geikielite hematite ilmenite pyrophanite corundum
7.55 10.26 75.14 2.64 4.42

Total solids mass = 74.24 (gm) density = 2.61 (gm/cc)
G = -1165999.77 (J) H = -996386.26 (J) S = 155.16 (J/K) V = 28.39 (cc) Cp = 86.96 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.54 (gm/cc)
G = -1581835.98 (J) H = -1341395.99 (J) S = 219.95 (J/K) V = 39.37 (cc) Cp = 121.39 (J/K)

Oxygen delta moles = 0.000701209 delta grams = 0.0224379
G = -170.88 (J) H = 18.21 (J) S = 0.17 (J/K) V = 63.73 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 23.90 (gm) density = 2.34 (gm/cc) viscosity = 6.27 (log 10 poise) (analysis in wt %)
G = -385575.43 (J) H = -320284.85 (J) S = 60.28 (J/K) V = 10.20 (cc) Cp = 31.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.28 | 0.34 | 13.91 | 0.28 | 0.00 | 0.87 | 0.23 | 0.12 | 0.00 | 0.00 | 1.55 | 2.22 | 5.76 | 0.25 | 4.19 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.50 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.16Mg0.73Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -43625.20 (J) H = -36204.65 (J) S = 6.85 (J/K) V = 0.97 (cc) Cp = 3.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -122.08 | 97.75 | 116.30 | 5.13 | -4.98 | 7.69 | 0.19 |

feldspar mass = 33.38 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -525537.08 (J) H = -449007.19 (J) S = 70.65 (J/K) V = 13.17 (cc) Cp = 39.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.58 | 2.28 | 66.14 |

feldspar mass = 12.25 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.67Ca0.24Al1.24Si2.76O8
G = -198957.32 (J) H = -170414.49 (J) S = 26.35 (J/K) V = 4.70 (cc) Cp = 14.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.94 | 23.75 | 9.31 |

quartz mass = 25.33 (gm) density = 2.55 (gm/cc)
SiO2
G = -413452.49 (J) H = -357836.43 (J) S = 51.35 (J/K) V = 9.93 (cc) Cp = 29.54 (J/K)

spinel mass = 1.26 (gm) density = 4.91 (gm/cc) (analysis in mole %)
Fe"1.26Mg0.05Fe'"1.29Al0.10Cr0.00Ti0.30O4
G = -8702.86 (J) H = -6208.68 (J) S = 2.30 (J/K) V = 0.26 (cc) Cp = 1.12 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 0.58 64.63 4.60 30.20

rhm-oxide mass = 0.40 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.07Fe'"0.20Al0.09Ti0.86O3
G = -3773.65 (J) H = -2992.15 (J) S = 0.72 (J/K) V = 0.08 (cc) Cp = 0.37 (J/K)
geikielite hematite ilmenite pyrophanite corundum
7.36 10.10 75.48 2.68 4.37

Total solids mass = 76.12 (gm) density = 2.61 (gm/cc)
G = -1194048.60 (J) H = -1022663.60 (J) S = 158.23 (J/K) V = 29.11 (cc) Cp = 89.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.54 (gm/cc)
G = -1579624.03 (J) H = -1342948.44 (J) S = 218.51 (J/K) V = 39.31 (cc) Cp = 121.09 (J/K)

Oxygen delta moles = 0.000663787 delta grams = 0.0212404
G = -160.13 (J) H = 17.00 (J) S = 0.16 (J/K) V = 59.78 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 22.15 (gm) density = 2.34 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -357342.88 (J) H = -297158.16 (J) S = 56.08 (J/K) V = 9.48 (cc) Cp = 29.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.01 | 0.31 | 13.94 | 0.27 | 0.00 | 0.84 | 0.25 | 0.11 | 0.00 | 0.00 | 1.55 | 2.26 | 5.67 | 0.27 | 4.53 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.58 (gm) density = 3.64 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.17Mg0.73Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -44399.90 (J) H = -36934.29 (J) S = 6.96 (J/K) V = 0.98 (cc) Cp = 3.94 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-123.17 97.85 117.20 5.27 -5.12 7.79 0.18

feldspar mass = 33.95 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -533565.05 (J) H = -456889.90 (J) S = 71.45 (J/K) V = 13.40 (cc) Cp = 40.07 (J/K)
albite anorthite sanidine
30.71 2.13 67.16

feldspar mass = 12.79 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.67Ca0.24Al1.24Si2.76O8
G = -207518.04 (J) H = -178147.30 (J) S = 27.37 (J/K) V = 4.91 (cc) Cp = 15.45 (J/K)
albite anorthite sanidine
67.08 24.07 8.85

quartz mass = 25.88 (gm) density = 2.55 (gm/cc)

SiO2
G = -422015.45 (J)  H = -366002.19 (J)  S = 52.20 (J/K)  V = 10.15 (cc)  Cp = 30.15 (J/K)

spinel  mass = 1.22 (gm)  density = 4.92 (gm/cc)  (analysis in mole %)
Fe"1.25Mg0.04Fe'''1.31Al0.10Cr0.00Ti0.29O4
G = -8391.91 (J)  H = -6008.03 (J)  S = 2.22 (J/K)  V = 0.25 (cc)  Cp = 1.09 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.74 | 65.41 | 4.40 | 29.44 |

rhm-oxide  mass = 0.44 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.76Mg0.07Fe'''0.20Al0.09Ti0.86O3
G = -4191.60 (J)  H = -3333.93 (J)  S = 0.80 (J/K)  V = 0.09 (cc)  Cp = 0.41 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.18 | 9.94 | 75.84 | 2.71 | 4.33 |

Total solids  mass = 77.87 (gm)  density = 2.61 (gm/cc)
G = -1220081.95 (J)  H = -1047315.64 (J)  S = 160.99 (J/K)  V = 29.78 (cc)  Cp = 91.11 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.02 (gm)  density = 2.55 (gm/cc)
G = -1577424.83 (J)  H = -1344473.81 (J)  S = 217.07 (J/K)  V = 39.26 (cc)  Cp = 120.82 (J/K)

Oxygen  delta moles = 0.000623179  delta grams = 0.019941
G = -148.80 (J)  H = 15.74 (J)  S = 0.15 (J/K)  V = 55.60 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 790.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.09  delta HM = -5.14  NNO = 0.00  QFM = 0.09  COH = 1.43  IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid  mass = 20.50 (gm)  density = 2.33 (gm/cc)  viscosity = 6.00 (log 10 poise)  (analysis in wt %)
G = -330845.96 (J)  H = -275393.67 (J)  S = 52.16 (J/K)  V = 8.80 (cc)  Cp = 27.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.69 | 0.28 | 13.99 | 0.27 | 0.00 | 0.81 | 0.26 | 0.11 | 0.00 | 0.00 | 1.55 | 2.30 | 5.56 | 0.29 | 4.89 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.65 (gm)  density = 3.64 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.18Mg0.72Fe'''0.03Ti0.00Al0.14Si1.92O6
G = -45164.88 (J)  H = -37659.13 (J)  S = 7.06 (J/K)  V = 1.00 (cc)  Cp = 4.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -124.28 | 97.96 | 118.09 | 5.41 | -5.27 | 7.91 | 0.18 |

feldspar  mass = 34.48 (gm)  density = 2.53 (gm/cc)  (analysis in mole %)
K0.68Na0.30Ca0.02Al1.02Si2.98O8
G = -540841.68 (J)  H = -464158.22 (J)  S = 72.13 (J/K)  V = 13.60 (cc)  Cp = 40.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.88 | 1.99 | 68.13 |

feldspar  mass = 13.31 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)

K0.08Na0.67Ca0.24Al1.24Si2.76O8
G = -215628.87 (J)  H = -185524.58 (J)  S = 28.32 (J/K)  V = 5.10 (cc)  Cp = 16.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.23 | 24.35 | 8.42 |

quartz mass = 26.41 (gm)  density = 2.55 (gm/cc)
SiO2
G = -430115.83 (J)  H = -373795.63 (J)  S = 52.97 (J/K)  V = 10.35 (cc)  Cp = 30.73 (J/K)

spinel mass = 1.18 (gm)  density = 4.92 (gm/cc)  (analysis in mole %)
Fe"1.24Mg0.04Fe'''1.32Al0.10Cr0.00Ti0.29O4
G = -8076.49 (J)  H = -5802.85 (J)  S = 2.14 (J/K)  V = 0.24 (cc)  Cp = 1.05 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.91 | 66.19 | 4.22 | 28.69 |

rhm-oxide mass = 0.48 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.76Mg0.07Fe'''0.20Al0.09Ti0.86O3
G = -4564.62 (J)  H = -3641.98 (J)  S = 0.87 (J/K)  V = 0.10 (cc)  Cp = 0.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.99 | 9.78 | 76.20 | 2.73 | 4.30 |

Total solids mass = 79.52 (gm)  density = 2.62 (gm/cc)
G = -1244392.37 (J)  H = -1070582.37 (J)  S = 163.49 (J/K)  V = 30.41 (cc)  Cp = 92.99 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm)  density = 2.55 (gm/cc)
G = -1575238.33 (J)  H = -1345976.04 (J)  S = 215.64 (J/K)  V = 39.21 (cc)  Cp = 120.57 (J/K)

Oxygen delta moles = 0.000579444  delta grams = 0.0185415
G = -136.93 (J)  H = 14.43 (J)  S = 0.14 (J/K)  V = 51.22 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 780.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = 0.08  COH = 1.40  IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 18.80 (gm)  density = 2.32 (gm/cc)  viscosity = 5.80 (log 10 poise)  (analysis in wt %)
G = -303496.51 (J)  H = -252761.77 (J)  S = 48.17 (J/K)  V = 8.11 (cc)  Cp = 25.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.41 | 0.24 | 13.83 | 0.27 | 0.00 | 0.79 | 0.28 | 0.10 | 0.00 | 0.00 | 1.57 | 2.45 | 5.40 | 0.32 | 5.33 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.70 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.16Fe"0.67Mg0.18)3Al2Si3O12
G = -9154.97 (J)  H = -7777.84 (J)  S = 1.31 (J/K)  V = 0.18 (cc)  Cp = 0.74 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.66 | 15.55 | 17.78 |

orthopyroxene mass = 3.45 (gm)  density = 3.65 (gm/cc)  (analysis in mole %)

opx Na0.00Ca0.02Fe"1.19Mg0.71Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -42548.84 (J) H = -35562.35 (J) S = 6.63 (J/K) V = 0.95 (cc) Cp = 3.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -125.03 | 98.01 | 118.89 | 5.38 | -5.24 | 7.81 | 0.18 |

feldspar mass = 35.28 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -552571.45 (J) H = -475278.95 (J) S = 73.39 (J/K) V = 13.92 (cc) Cp = 41.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.37 | 1.85 | 68.78 |

feldspar mass = 13.26 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.68Ca0.24Al1.24Si2.76O8
G = -214576.69 (J) H = -185021.06 (J) S = 28.06 (J/K) V = 5.08 (cc) Cp = 16.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.73 | 24.13 | 8.14 |

quartz mass = 26.97 (gm) density = 2.55 (gm/cc)
SiO2
G = -438679.87 (J) H = -382020.77 (J) S = 53.80 (J/K) V = 10.57 (cc) Cp = 31.35 (J/K)

spinel mass = 0.99 (gm) density = 4.93 (gm/cc) (analysis in mole %)
Fe"1.24Mg0.04Fe"'1.34Al0.10Cr0.00Ti0.28O4
G = -6694.71 (J) H = -4826.53 (J) S = 1.77 (J/K) V = 0.20 (cc) Cp = 0.88 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.96 | 66.98 | 4.04 | 28.03 |

rhm-oxide mass = 0.55 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.07Fe"'0.19Al0.08Ti0.86O3
G = -5222.61 (J) H = -4179.60 (J) S = 0.99 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.81 | 9.64 | 76.63 | 2.74 | 4.18 |

Total solids mass = 81.21 (gm) density = 2.62 (gm/cc)
G = -1269449.15 (J) H = -1094667.11 (J) S = 165.96 (J/K) V = 31.02 (cc) Cp = 94.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.56 (gm/cc)
G = -1572945.66 (J) H = -1347428.88 (J) S = 214.14 (J/K) V = 39.12 (cc) Cp = 120.28 (J/K)

Oxygen delta moles = 0.000304823 delta grams = 0.00975398
G = -71.28 (J) H = 7.49 (J) S = 0.07 (J/K) V = 26.69 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 770.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = 0.07 COH = 1.37 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 17.02 (gm) density = 2.31 (gm/cc) viscosity = 5.51 (log 10 poise) (analysis in wt %)
G = -274862.04 (J) H = -228885.24 (J) S = 44.07 (J/K) V = 7.38 (cc) Cp = 23.06 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.15 0.21 13.41 0.28 0.00 0.79 0.30 0.10 0.00 0.00 1.61 2.76 5.15 0.35 5.89 0.00 0.00 0.00 0.00

garnet mass = 2.22 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.67Mg0.17)3Al2Si3O12
G = -28956.96 (J) H = -24659.63 (J) S = 4.12 (J/K) V = 0.55 (cc) Cp = 2.35 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.79 | 16.01 | 17.20 |

orthopyroxene mass = 2.95 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.20Mg0.71Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -36281.98 (J) H = -30397.59 (J) S = 5.64 (J/K) V = 0.81 (cc) Cp = 3.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -125.34 | 98.00 | 119.61 | 5.11 | -4.98 | 7.43 | 0.18 |

feldspar mass = 36.44 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -569796.57 (J) H = -491173.81 (J) S = 75.37 (J/K) V = 14.37 (cc) Cp = 42.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.27 | 1.72 | 69.01 |

feldspar mass = 12.52 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -202434.79 (J) H = -174918.28 (J) S = 26.38 (J/K) V = 4.80 (cc) Cp = 15.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.69 | 23.28 | 8.03 |

quartz mass = 27.58 (gm) density = 2.55 (gm/cc)
SiO2
G = -447936.12 (J) H = -390879.44 (J) S = 54.70 (J/K) V = 10.81 (cc) Cp = 32.01 (J/K)

spinel mass = 0.60 (gm) density = 4.93 (gm/cc) (analysis in mole %)
Fe"1.24Mg0.04Fe'"1.36Al0.09Cr0.00Ti0.27O4
G = -4048.17 (J) H = -2927.99 (J) S = 1.07 (J/K) V = 0.12 (cc) Cp = 0.53 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.87 | 67.78 | 3.87 | 27.48 |

rhm-oxide mass = 0.66 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.07Fe'"0.19Al0.08Ti0.87O3
G = -6202.82 (J) H = -4978.58 (J) S = 1.17 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.66 | 9.52 | 77.12 | 2.75 | 3.95 |

Total solids mass = 82.97 (gm) density = 2.62 (gm/cc)
G = -1295657.41 (J) H = -1119935.31 (J) S = 168.45 (J/K) V = 31.61 (cc) Cp = 96.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1570519.45 (J) H = -1348820.55 (J) S = 212.53 (J/K) V = 38.99 (cc) Cp = 119.96 (J/K)

Oxygen delta moles = -0.000256158 delta grams = -0.00819674

G = 59.28 (J)  H = -6.20 (J)  S = -0.06 (J/K)  V = -22.22 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 760.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.77  delta HM = -5.17  NNO = 0.00  QFM = 0.07  COH = 1.34  IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid  mass = 15.33 (gm)  density = 2.29 (gm/cc)  viscosity = 5.18 (log 10 poise)  (analysis in wt %)
G = -247679.69 (J)  H = -206148.09 (J)  S = 40.20 (J/K)  V = 6.69 (cc)  Cp = 20.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.76 | 0.18 | 12.98 | 0.28 | 0.00 | 0.79 | 0.33 | 0.09 | 0.00 | 0.00 | 1.65 | 3.13 | 4.87 | 0.39 | 6.54 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 3.62 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.16Fe"0.67Mg0.17)3Al2Si3O12
G = -47093.11 (J)  H = -40198.71 (J)  S = 6.67 (J/K)  V = 0.90 (cc)  Cp = 3.82 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.94 | 16.42 | 16.64 |

orthopyroxene  mass = 2.53 (gm)  density = 3.65 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.20Mg0.70Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -30944.99 (J)  H = -25988.50 (J)  S = 4.80 (J/K)  V = 0.69 (cc)  Cp = 2.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -125.70 | 98.00 | 120.33 | 4.86 | -4.75 | 7.08 | 0.18 |

feldspar  mass = 37.51 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -585817.86 (J)  H = -506093.45 (J)  S = 77.17 (J/K)  V = 14.80 (cc)  Cp = 44.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.18 | 1.58 | 69.23 |

feldspar  mass = 11.83 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -191024.77 (J)  H = -165404.90 (J)  S = 24.80 (J/K)  V = 4.54 (cc)  Cp = 14.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.69 | 22.38 | 7.93 |

quartz  mass = 28.16 (gm)  density = 2.55 (gm/cc)
SiO2
G = -456926.58 (J)  H = -399537.52 (J)  S = 55.55 (J/K)  V = 11.04 (cc)  Cp = 32.65 (J/K)

spinel  mass = 0.23 (gm)  density = 4.94 (gm/cc)  (analysis in mole %)
Fe"1.23Mg0.04Fe'"1.37Al0.09Cr0.00Ti0.27O4
G = -1563.04 (J)  H = -1134.27 (J)  S = 0.42 (J/K)  V = 0.05 (cc)  Cp = 0.21 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.80 | 68.58 | 3.70 | 26.92 |

rhm-oxide  mass = 0.75 (gm)  density = 4.69 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.78Mg0.06Fe'"0.19Al0.07Ti0.87O3
G = -7067.71 (J)  H = -5689.44 (J)  S = 1.33 (J/K)  V = 0.16 (cc)  Cp = 0.69 (J/K)

geikielite hematite ilmenite pyrophanite corundum
6.50 9.40 77.62 2.74 3.74

Total solids mass = 84.64 (gm) density = 2.63 (gm/cc)
G = -1320438.06 (J) H = -1144046.80 (J) S = 170.73 (J/K) V = 32.18 (cc) Cp = 98.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1568117.75 (J) H = -1350194.89 (J) S = 210.93 (J/K) V = 38.87 (cc) Cp = 119.68 (J/K)

Oxygen delta moles = -0.000801573 delta grams = -0.0256494
G = 183.52 (J) H = -19.12 (J) S = -0.20 (J/K) V = -68.85 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 750.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = 0.06 COH = 1.30 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 13.73 (gm) density = 2.28 (gm/cc) viscosity = 4.83 (log 10 poise) (analysis in wt %)
G = -222014.53 (J) H = -184629.28 (J) S = 36.54 (J/K) V = 6.03 (cc) Cp = 18.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.19 | 0.15 | 12.63 | 0.29 | 0.00 | 0.78 | 0.36 | 0.09 | 0.00 | 0.00 | 1.70 | 3.51 | 4.58 | 0.44 | 7.30 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.68 (gm) density = 4.01 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.67Mg0.16)3Al2Si3O12
G = -60862.21 (J) H = -52077.74 (J) S = 8.59 (J/K) V = 1.17 (cc) Cp = 4.94 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.87 | 16.71 | 16.42 |

orthopyroxene mass = 2.16 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.20Mg0.71Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -26447.55 (J) H = -22274.31 (J) S = 4.08 (J/K) V = 0.59 (cc) Cp = 2.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -124.92 | 98.02 | 119.89 | 4.66 | -4.56 | 6.73 | 0.18 |

feldspar mass = 38.41 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -598822.53 (J) H = -518464.25 (J) S = 78.54 (J/K) V = 15.15 (cc) Cp = 45.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.97 | 1.46 | 69.57 |

feldspar mass = 11.41 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.71Ca0.22Al1.22Si2.78O8
G = -183927.82 (J) H = -159595.97 (J) S = 23.78 (J/K) V = 4.38 (cc) Cp = 13.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.58 | 21.64 | 7.78 |

quartz mass = 28.77 (gm) density = 2.55 (gm/cc)

SiO2
G = -466146.25 (J)  H = -408427.21 (J)  S = 56.41 (J/K)  V = 11.28 (cc)  Cp = 33.31 (J/K)

rhm-oxide  mass = 0.81 (gm)  density = 4.69 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.78Mg0.06Fe'"0.18Al0.07Ti0.87O3
G = -7603.96 (J)  H = -6140.85 (J)  S = 1.43 (J/K)  V = 0.17 (cc)  Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.48 | 9.14 | 78.05 | 2.74 | 3.58 |

Total solids  mass = 86.23 (gm)  density = 2.63 (gm/cc)
G = -1343810.32 (J)  H = -1166980.33 (J)  S = 172.83 (J/K)  V = 32.73 (cc)  Cp = 100.68 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.58 (gm/cc)
G = -1565824.85 (J)  H = -1351609.61 (J)  S = 209.37 (J/K)  V = 38.76 (cc)  Cp = 119.48 (J/K)

Oxygen  delta moles = -0.00116923  delta grams = -0.0374138
G = 264.84 (J)  H = -27.49 (J)  S = -0.29 (J/K)  V = -99.46 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 740.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = 0.05  COH = 1.27  IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 12.21 (gm)  density = 2.26 (gm/cc)  viscosity = 4.45 (log 10 poise)  (analysis in wt %)
G = -197683.85 (J)  H = -164191.96 (J)  S = 33.06 (J/K)  V = 5.40 (cc)  Cp = 16.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.33 | 0.12 | 12.43 | 0.29 | 0.00 | 0.75 | 0.40 | 0.09 | 0.00 | 0.00 | 1.74 | 3.86 | 4.28 | 0.49 | 8.21 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 5.23 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.66Mg0.17)3Al2Si3O12
G = -68067.95 (J)  H = -58393.56 (J)  S = 9.55 (J/K)  V = 1.31 (cc)  Cp = 5.51 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.30 | 16.85 | 16.85 |

orthopyroxene  mass = 1.83 (gm)  density = 3.64 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.17Mg0.74Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -22536.42 (J)  H = -19049.98 (J)  S = 3.44 (J/K)  V = 0.50 (cc)  Cp = 2.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -121.76 | 98.06 | 117.07 | 4.55 | -4.45 | 6.36 | 0.18 |

feldspar  mass = 39.01 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.70Na0.28Ca0.01Al1.01Si2.99O8
G = -607193.40 (J)  H = -526868.94 (J)  S = 79.28 (J/K)  V = 15.38 (cc)  Cp = 46.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.50 | 1.35 | 70.15 |

feldspar  mass = 11.46 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)

K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -184487.30 (J) H = -160425.70 (J) S = 23.75 (J/K) V = 4.39 (cc) Cp = 14.10 (J/K)
albite anorthite sanidine
71.19 21.26 7.54

quartz mass = 29.42 (gm) density = 2.55 (gm/cc)
SiO2
G = -476092.83 (J) H = -417986.53 (J) S = 57.35 (J/K) V = 11.53 (cc) Cp = 34.01 (J/K)

rhm-oxide mass = 0.82 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.78Mg0.07Fe'"0.17Al0.07Ti0.88O3
G = -7656.23 (J) H = -6206.20 (J) S = 1.43 (J/K) V = 0.17 (cc) Cp = 0.74 (J/K)
geikielite hematite ilmenite pyrophanite corundum
6.76 8.64 78.33 2.78 3.50

Total solids mass = 87.76 (gm) density = 2.64 (gm/cc)
G = -1366034.12 (J) H = -1188930.92 (J) S = 174.80 (J/K) V = 33.29 (cc) Cp = 102.54 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1563717.98 (J) H = -1353122.87 (J) S = 207.86 (J/K) V = 38.70 (cc) Cp = 119.39 (J/K)

Oxygen delta moles = -0.001209 delta grams = -0.0386865
G = 270.90 (J) H = -28.00 (J) S = -0.30 (J/K) V = -101.84 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 730.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = 0.04 COH = 1.24 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 10.62 (gm) density = 2.24 (gm/cc) viscosity = 3.96 (log 10 poise) (analysis in wt %)
G = -172407.08 (J) H = -142851.27 (J) S = 29.46 (J/K) V = 4.75 (cc) Cp = 14.82 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.06 0.10 12.23 0.29 0.00 0.73 0.46 0.09 0.00 0.00 1.81 4.31 3.92 0.57 9.44 0.00 0.00 0.00 0.00

garnet mass = 5.73 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.66Mg0.17)3Al2Si3O12
G = -74630.77 (J) H = -64187.54 (J) S = 10.41 (J/K) V = 1.43 (cc) Cp = 6.04 (J/K)
almandine grossular pyrope
65.73 16.95 17.32

orthopyroxene mass = 1.53 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.78Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -18973.65 (J) H = -16096.89 (J) S = 2.87 (J/K) V = 0.42 (cc) Cp = 1.68 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-118.55 98.10 114.17 4.43 -4.34 6.01 0.18

feldspar mass = 39.59 (gm) density = 2.54 (gm/cc) (analysis in mole %)

K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -615230.94 (J) H = -535016.55 (J) S = 79.96 (J/K) V = 15.61 (cc) Cp = 46.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.00 | 1.24 | 70.76 |

feldspar mass = 11.57 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.72Ca0.21Al1.21Si2.79O8
G = -186050.05 (J) H = -162133.04 (J) S = 23.84 (J/K) V = 4.44 (cc) Cp = 14.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.79 | 20.91 | 7.30 |

quartz mass = 30.10 (gm) density = 2.55 (gm/cc)
SiO2
G = -486638.92 (J) H = -428107.15 (J) S = 58.35 (J/K) V = 11.80 (cc) Cp = 34.76 (J/K)

rhm-oxide mass = 0.82 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.79Mg0.07Fe'"0.16Al0.07Ti0.88O3
G = -7696.93 (J) H = -6262.44 (J) S = 1.43 (J/K) V = 0.18 (cc) Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.06 | 8.14 | 78.60 | 2.78 | 3.42 |

Total solids mass = 89.34 (gm) density = 2.64 (gm/cc)
G = -1389221.26 (J) H = -1211803.60 (J) S = 176.86 (J/K) V = 33.88 (cc) Cp = 104.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1561628.34 (J) H = -1354654.87 (J) S = 206.32 (J/K) V = 38.63 (cc) Cp = 119.38 (J/K)

Oxygen delta moles = -0.00124491 delta grams = -0.0398357
G = 275.91 (J) H = -28.40 (J) S = -0.30 (J/K) V = -103.83 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.39 (gm/cc)  viscosity = 4.58 (log 10 poise)  (analysis in wt %)
G = -1699074.85 (J)  H = -1260436.11 (J)  S = 278.83 (J/K)  V = 41.81 (cc)  Cp = 140.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.49 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.58 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.39 (gm/cc)
G = -1699074.85 (J)  H = -1260436.11 (J)  S = 278.83 (J/K)  V = 41.81 (cc)  Cp = 140.20 (J/K)

Oxygen  delta moles = -7.97973e-17  delta grams = -2.55342e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.39 (gm/cc)  viscosity = 4.64 (log 10 poise)  (analysis in wt %)
G = -1696291.99 (J)  H = -1261838.88 (J)  S = 277.93 (J/K)  V = 41.78 (cc)  Cp = 140.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.49 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.64 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.39 (gm/cc)
G = -1696291.99 (J)  H = -1261838.88 (J)  S = 277.93 (J/K)  V = 41.78 (cc)  Cp = 140.19 (J/K)

Oxygen  delta moles = 1.79495e-06  delta grams = 5.74363e-05
G = -0.65 (J)  H = 0.08 (J)  S = 0.00 (J/K)  V = 0.23 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.39 (gm/cc)  viscosity = 4.71 (log 10 poise)  (analysis in wt %)
G = -1693518.21 (J)  H = -1263241.67 (J)  S = 277.03 (J/K)  V = 41.76 (cc)  Cp = 140.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.49 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.39 (gm/cc)
G = -1693518.21 (J)  H = -1263241.67 (J)  S = 277.03 (J/K)  V = 41.76 (cc)  Cp = 140.18 (J/K)

Oxygen  delta moles = 3.79381e-06  delta grams = 0.000121397
G = -1.37 (J)  H = 0.16 (J)  S = 0.00 (J/K)  V = 0.49 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.40 (gm/cc)  viscosity = 4.77 (log 10 poise)  (analysis in wt %)
G = -1690753.57 (J)  H = -1264644.48 (J)  S = 276.13 (J/K)  V = 41.73 (cc)  Cp = 140.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.49 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.40 (gm/cc)
G = -1690753.57 (J)  H = -1264644.48 (J)  S = 276.13 (J/K)  V = 41.73 (cc)  Cp = 140.18 (J/K)

Oxygen  delta moles = 6.00231e-06  delta grams = 0.000192067
G = -2.15 (J)  H = 0.25 (J)  S = 0.00 (J/K)  V = 0.77 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.40 (gm/cc)  viscosity = 4.83 (log 10 poise)  (analysis in wt %)
G = -1687998.12 (J)  H = -1266047.32 (J)  S = 275.22 (J/K)  V = 41.70 (cc)  Cp = 140.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.49 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.40 (gm/cc)
G = -1687998.12 (J)  H = -1266047.32 (J)  S = 275.22 (J/K)  V = 41.70 (cc)  Cp = 140.17 (J/K)

Oxygen  delta moles = 8.42643e-06  delta grams = 0.000269636
G = -2.99 (J)  H = 0.35 (J)  S = 0.00 (J/K)  V = 1.07 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.40 (gm/cc)  viscosity = 4.90 (log 10 poise)  (analysis in wt %)
G = -1685251.93 (J)  H = -1267450.19 (J)  S = 274.30 (J/K)  V = 41.67 (cc)  Cp = 140.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.90 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.40 (gm/cc)
G = -1685251.93 (J)  H = -1267450.19 (J)  S = 274.30 (J/K)  V = 41.67 (cc)  Cp = 140.16 (J/K)

Oxygen  delta moles = 1.10724e-05  delta grams = 0.000354303
G = -3.90 (J)  H = 0.46 (J)  S = 0.00 (J/K)  V = 1.40 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 4.96 (log 10 poise) (analysis in wt %)
G = -1682515.06 (J) H = -1268853.09 (J) S = 273.38 (J/K) V = 41.64 (cc) Cp = 140.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.96 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1682515.06 (J) H = -1268853.09 (J) S = 273.38 (J/K) V = 41.64 (cc) Cp = 140.16 (J/K)

Oxygen delta moles = 1.39466e-05 delta grams = 0.000446276
G = -4.88 (J) H = 0.57 (J) S = 0.00 (J/K) V = 1.75 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 5.03 (log 10 poise) (analysis in wt %)
G = -1679787.57 (J) H = -1270256.04 (J) S = 272.45 (J/K) V = 41.62 (cc) Cp = 140.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.03 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1679787.57 (J) H = -1270256.04 (J) S = 272.45 (J/K) V = 41.62 (cc) Cp = 140.15 (J/K)

Oxygen delta moles = 1.7056e-05 delta grams = 0.000545772
G = -5.92 (J) H = 0.69 (J) S = 0.00 (J/K) V = 2.13 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.40 (gm/cc) viscosity = 5.10 (log 10 poise) (analysis in wt %)
G = -1677069.54 (J) H = -1271659.04 (J) S = 271.51 (J/K) V = 41.59 (cc) Cp = 140.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System mass = 100.00 (gm) density = 2.40 (gm/cc)
G = -1677069.54 (J) H = -1271659.04 (J) S = 271.51 (J/K) V = 41.59 (cc) Cp = 140.14 (J/K)

Oxygen delta moles = 2.04075e-05 delta grams = 0.000653015
G = -7.03 (J) H = 0.82 (J) S = 0.01 (J/K) V = 2.53 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 5.17 (log 10 poise) (analysis in wt %)
G = -1674361.02 (J) H = -1273062.08 (J) S = 270.57 (J/K) V = 41.56 (cc) Cp = 140.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.28 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.17 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1674361.02 (J) H = -1273062.08 (J) S = 270.57 (J/K) V = 41.56 (cc) Cp = 140.13 (J/K)

Oxygen delta moles = 2.40085e-05 delta grams = 0.000768243
G = -8.21 (J) H = 0.96 (J) S = 0.01 (J/K) V = 2.96 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -1671661.95 (J) H = -1274409.39 (J) S = 269.66 (J/K) V = 41.53 (cc) Cp = 131.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.28 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.24 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1671661.95 (J) H = -1274409.39 (J) S = 269.66 (J/K) V = 41.53 (cc) Cp = 131.98 (J/K)

Oxygen delta moles = 2.78666e-05 delta grams = 0.000891699
G = -9.46 (J) H = 1.10 (J) S = 0.01 (J/K) V = 3.41 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 5.31 (log 10 poise) (analysis in wt %)
G = -1668972.00 (J) H = -1275730.93 (J) S = 268.76 (J/K) V = 41.50 (cc) Cp = 131.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.28 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1668972.00 (J) H = -1275730.93 (J) S = 268.76 (J/K) V = 41.50 (cc) Cp = 131.95 (J/K)

Oxygen delta moles = 3.199e-05 delta grams = 0.00102364
G = -10.78 (J) H = 1.26 (J) S = 0.01 (J/K) V = 3.89 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1666291.22 (J) H = -1277052.33 (J) S = 267.86 (J/K) V = 41.48 (cc) Cp = 131.92 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.50 0.00 2.28 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1666291.22 (J) H = -1277052.33 (J) S = 267.86 (J/K) V = 41.48 (cc) Cp = 131.92 (J/K)

Oxygen delta moles = 3.6387e-05 delta grams = 0.00116434
G = -12.17 (J) H = 1.41 (J) S = 0.01 (J/K) V = 4.40 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 5.45 (log 10 poise) (analysis in wt %)
G = -1663619.66 (J) H = -1278373.59 (J) S = 266.95 (J/K) V = 41.45 (cc) Cp = 131.89 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.50 0.00 2.28 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1663619.66 (J) H = -1278373.59 (J) S = 266.95 (J/K) V = 41.45 (cc) Cp = 131.89 (J/K)

Oxygen delta moles = 4.10662e-05 delta grams = 0.00131407
G = -13.63 (J) H = 1.58 (J) S = 0.01 (J/K) V = 4.93 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.41 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -1660957.38 (J) H = -1279694.69 (J) S = 266.03 (J/K) V = 41.42 (cc) Cp = 131.86 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

73.28 0.40 12.72 0.51 0.00 2.28 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.41 (gm/cc)
G = -1660957.38 (J) H = -1279694.69 (J) S = 266.03 (J/K) V = 41.42 (cc) Cp = 131.86 (J/K)

Oxygen delta moles = 4.6037e-05 delta grams = 0.00147313
G = -15.16 (J) H = 1.76 (J) S = 0.01 (J/K) V = 5.49 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -1658304.46 (J) H = -1281015.63 (J) S = 265.11 (J/K) V = 41.39 (cc) Cp = 131.83 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.51 0.00 2.28 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.60 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1658304.46 (J) H = -1281015.63 (J) S = 265.11 (J/K) V = 41.39 (cc) Cp = 131.83 (J/K)

Oxygen delta moles = 5.13087e-05 delta grams = 0.00164182
G = -16.76 (J) H = 1.94 (J) S = 0.01 (J/K) V = 6.07 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1140.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.26 COH = 2.13 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1655660.97 (J) H = -1282336.41 (J) S = 264.18 (J/K) V = 41.36 (cc) Cp = 131.80 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.51 0.00 2.27 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.67 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1655660.97 (J) H = -1282336.41 (J) S = 264.18 (J/K) V = 41.36 (cc) Cp = 131.80 (J/K)

Oxygen delta moles = 5.68915e-05 delta grams = 0.00182046
G = -18.44 (J) H = 2.13 (J) S = 0.01 (J/K) V = 6.68 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -1653026.96 (J) H = -1283657.00 (J) S = 263.24 (J/K) V = 41.34 (cc) Cp = 131.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.51 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1653026.96 (J) H = -1283657.00 (J) S = 263.24 (J/K) V = 41.34 (cc) Cp = 131.76 (J/K)

Oxygen delta moles = 6.27959e-05 delta grams = 0.00200939
G = -20.20 (J) H = 2.33 (J) S = 0.02 (J/K) V = 7.33 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1120.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.25 COH = 2.09 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 5.83 (log 10 poise) (analysis in wt %)
G = -1650402.52 (J) H = -1284977.42 (J) S = 262.30 (J/K) V = 41.31 (cc) Cp = 131.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.51 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1650402.52 (J)  H = -1284977.42 (J)  S = 262.30 (J/K)  V = 41.31 (cc)  Cp = 131.73 (J/K)

Oxygen  delta moles = 6.90326e-05  delta grams = 0.00220896
G = -22.02 (J)  H = 2.53 (J)  S = 0.02 (J/K)  V = 8.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1110.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.24  COH = 2.07  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 5.90 (log 10 poise)  (analysis in wt %)
G = -1647787.71 (J)  H = -1286297.65 (J)  S = 261.35 (J/K)  V = 41.28 (cc)  Cp = 131.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.90 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1647787.71 (J)  H = -1286297.65 (J)  S = 261.35 (J/K)  V = 41.28 (cc)  Cp = 131.69 (J/K)

Oxygen  delta moles = 7.56133e-05  delta grams = 0.00241954
G = -23.93 (J)  H = 2.75 (J)  S = 0.02 (J/K)  V = 8.70 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1100.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.23  COH = 2.05  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 5.98 (log 10 poise)  (analysis in wt %)
G = -1645182.60 (J)  H = -1287617.68 (J)  S = 260.40 (J/K)  V = 41.25 (cc)  Cp = 131.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.98 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1645182.60 (J) H = -1287617.68 (J) S = 260.40 (J/K) V = 41.25 (cc) Cp = 131.65 (J/K)

Oxygen delta moles = 8.255e-05 delta grams = 0.0026415
G = -25.92 (J) H = 2.97 (J) S = 0.02 (J/K) V = 9.42 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -1642587.26 (J) H = -1288937.50 (J) S = 259.44 (J/K) V = 41.23 (cc) Cp = 131.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.27 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.07 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1642587.26 (J) H = -1288937.50 (J) S = 259.44 (J/K) V = 41.23 (cc) Cp = 131.61 (J/K)

Oxygen delta moles = 8.98552e-05 delta grams = 0.00287526
G = -27.98 (J) H = 3.20 (J) S = 0.02 (J/K) V = 10.18 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1080.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.22 COH = 2.01 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 6.15 (log 10 poise) (analysis in wt %)
G = -1640001.78 (J) H = -1290257.12 (J) S = 258.47 (J/K) V = 41.20 (cc) Cp = 131.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.52 | 0.00 | 2.26 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.15 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1640001.78 (J) H = -1290257.12 (J) S = 258.47 (J/K) V = 41.20 (cc) Cp = 131.57 (J/K)

Oxygen delta moles = 9.75421e-05 delta grams = 0.00312123
G = -30.13 (J) H = 3.44 (J) S = 0.02 (J/K) V = 10.97 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1070.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.22 COH = 1.99 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -1637426.22 (J) H = -1291576.52 (J) S = 257.49 (J/K) V = 41.17 (cc) Cp = 131.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.27 | 0.40 | 12.72 | 0.53 | 0.00 | 2.26 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 6.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1637426.22 (J) H = -1291576.52 (J) S = 257.49 (J/K) V = 41.17 (cc) Cp = 131.53 (J/K)

Oxygen delta moles = 0.000105624 delta grams = 0.00337986
G = -32.35 (J) H = 3.68 (J) S = 0.03 (J/K) V = 11.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1060.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.21 COH = 1.97 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 99.85 (gm) density = 2.43 (gm/cc) viscosity = 6.31 (log 10 poise) (analysis in wt %)
G = -1632267.06 (J) H = -1290792.05 (J) S = 256.14 (J/K) V = 41.08 (cc) Cp = 131.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.23 | 0.40 | 12.74 | 0.53 | 0.00 | 2.26 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.39 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 0.15 (gm) density = 2.55 (gm/cc)
SiO2
G = -2593.86 (J) H = -2126.79 (J) S = 0.35 (J/K) V = 0.06 (cc) Cp = 0.18 (J/K)

Total solids mass = 0.15 (gm) density = 2.55 (gm/cc)
G = -2593.86 (J) H = -2126.79 (J) S = 0.35 (J/K) V = 0.06 (cc) Cp = 0.18 (J/K)

Viscosity of the System: 6.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1634860.92 (J) H = -1292918.84 (J) S = 256.49 (J/K) V = 41.14 (cc) Cp = 131.48 (J/K)

Oxygen delta moles = 0.000114575 delta grams = 0.00366626
G = -34.81 (J) H = 3.96 (J) S = 0.03 (J/K) V = 12.70 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1050.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.95 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 98.99 (gm) density = 2.43 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -1615203.22 (J) H = -1280311.60 (J) S = 253.10 (J/K) V = 40.68 (cc) Cp = 130.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.00 | 0.41 | 12.85 | 0.54 | 0.00 | 2.28 | 0.06 | 0.49 | 0.00 | 0.00 | 1.16 | 2.70 | 5.44 | 0.06 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 1.02 (gm) density = 2.55 (gm/cc)
SiO2
G = -17104.29 (J) H = -14055.44 (J) S = 2.30 (J/K) V = 0.40 (cc) Cp = 1.21 (J/K)

Total solids mass = 1.02 (gm) density = 2.55 (gm/cc)
G = -17104.29 (J) H = -14055.44 (J) S = 2.30 (J/K) V = 0.40 (cc) Cp = 1.21 (J/K)

Viscosity of the System: 6.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1632307.51 (J) H = -1294367.04 (J) S = 255.41 (J/K) V = 41.08 (cc) Cp = 131.42 (J/K)

Oxygen delta moles = 0.000126101 delta grams = 0.00403507
G = -37.99 (J) H = 4.31 (J) S = 0.03 (J/K) V = 13.87 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1040.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.93 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 98.14 (gm) density = 2.44 (gm/cc) viscosity = 6.42 (log 10 poise) (analysis in wt %)
G = -1598457.94 (J) H = -1270028.33 (J) S = 250.11 (J/K) V = 40.29 (cc) Cp = 129.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.77 | 0.41 | 12.96 | 0.55 | 0.00 | 2.29 | 0.06 | 0.49 | 0.00 | 0.00 | 1.17 | 2.73 | 5.49 | 0.06 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 1.87 (gm) density = 2.55 (gm/cc)

SiO2
G = -31307.28 (J)  H = -25783.60 (J)  S = 4.21 (J/K)  V = 0.73 (cc)  Cp = 2.22 (J/K)

Total solids  mass = 1.87 (gm)  density = 2.55 (gm/cc)
G = -31307.28 (J)  H = -25783.60 (J)  S = 4.21 (J/K)  V = 0.73 (cc)  Cp = 2.22 (J/K)

Viscosity of the System: 6.45 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1629765.22 (J)  H = -1295811.94 (J)  S = 254.31 (J/K)  V = 41.02 (cc)  Cp = 131.35 (J/K)

Oxygen  delta moles = 0.000138093  delta grams = 0.00441881
G = -41.25 (J)  H = 4.67 (J)  S = 0.03 (J/K)  V = 15.08 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1030.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.19  COH = 1.91  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.98 (gm)  density = 2.44 (gm/cc)  viscosity = 6.50 (log 10 poise)  (analysis in wt %)
G = -1577344.35 (J)  H = -1256316.03 (J)  S = 246.35 (J/K)  V = 39.80 (cc)  Cp = 127.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.58 | 0.41 | 13.11 | 0.54 | 0.00 | 2.25 | 0.06 | 0.44 | 0.00 | 0.00 | 1.19 | 2.76 | 5.55 | 0.06 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.28 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.88Mg1.04Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -3818.36 (J)  H = -3021.82 (J)  S = 0.61 (J/K)  V = 0.08 (cc)  Cp = 0.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.61 | 97.62 | 87.87 | 3.17 | -3.07 | 5.73 | 0.29 |

quartz  mass = 2.75 (gm)  density = 2.55 (gm/cc)
SiO2
G = -46051.49 (J)  H = -38010.06 (J)  S = 6.17 (J/K)  V = 1.08 (cc)  Cp = 3.27 (J/K)

Total solids  mass = 3.03 (gm)  density = 2.62 (gm/cc)
G = -49869.85 (J)  H = -41031.88 (J)  S = 6.78 (J/K)  V = 1.16 (cc)  Cp = 3.59 (J/K)

Viscosity of the System: 6.55 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1627214.20 (J)  H = -1297347.91 (J)  S = 253.13 (J/K)  V = 40.96 (cc)  Cp = 131.20 (J/K)

Oxygen  delta moles = 0.00011288  delta grams = 0.00361201
G = -33.43 (J)  H = 3.77 (J)  S = 0.03 (J/K)  V = 12.23 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1020.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.18  COH = 1.89  IW

= 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 95.84 (gm) density = 2.44 (gm/cc) viscosity = 6.57 (log 10 poise) (analysis in wt %)
G = -1556691.91 (J) H = -1242907.65 (J) S = 242.65 (J/K) V = 39.32 (cc) Cp = 126.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.40 | 0.42 | 13.26 | 0.54 | 0.00 | 2.20 | 0.06 | 0.40 | 0.00 | 0.00 | 1.20 | 2.79 | 5.62 | 0.06 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.56 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg1.00Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -7584.53 (J) H = -6009.51 (J) S = 1.22 (J/K) V = 0.16 (cc) Cp = 0.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.07 | 97.56 | 91.03 | 3.38 | -3.27 | 6.08 | 0.30 |

quartz mass = 3.61 (gm) density = 2.55 (gm/cc)
SiO2
G = -60397.17 (J) H = -49960.41 (J) S = 8.07 (J/K) V = 1.41 (cc) Cp = 4.29 (J/K)

Total solids mass = 4.17 (gm) density = 2.65 (gm/cc)
G = -67981.71 (J) H = -55969.92 (J) S = 9.29 (J/K) V = 1.57 (cc) Cp = 4.94 (J/K)

Viscosity of the System: 6.64 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1624673.61 (J) H = -1298877.56 (J) S = 251.94 (J/K) V = 40.89 (cc) Cp = 131.05 (J/K)

Oxygen delta moles = 8.49672e-05 delta grams = 0.00271885
G = -24.95 (J) H = 2.81 (J) S = 0.02 (J/K) V = 9.14 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1010.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.86 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 94.72 (gm) density = 2.44 (gm/cc) viscosity = 6.65 (log 10 poise) (analysis in wt %)
G = -1536551.52 (J) H = -1229844.10 (J) S = 239.03 (J/K) V = 38.84 (cc) Cp = 124.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.22 | 0.42 | 13.41 | 0.53 | 0.00 | 2.15 | 0.06 | 0.36 | 0.00 | 0.00 | 1.21 | 2.83 | 5.68 | 0.06 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.83 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.94Mg0.97Fe'"0.03Ti0.00Al0.10Si1.93O6
G = -11245.46 (J) H = -8921.07 (J) S = 1.81 (J/K) V = 0.24 (cc) Cp = 0.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.54 | 97.50 | 94.17 | 3.60 | -3.49 | 6.45 | 0.31 |

quartz mass = 4.45 (gm) density = 2.55 (gm/cc)

SiO2
G = -74346.82 (J)  H = -61634.52 (J)  S = 9.91 (J/K)  V = 1.74 (cc)  Cp = 5.29 (J/K)

Total solids  mass = 5.28 (gm)  density = 2.67 (gm/cc)
G = -85592.29 (J)  H = -70555.59 (J)  S = 11.72 (J/K)  V = 1.98 (cc)  Cp = 6.25 (J/K)

Viscosity of the System: 6.74 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1622143.81 (J)  H = -1300399.69 (J)  S = 250.75 (J/K)  V = 40.82 (cc)  Cp = 130.90 (J/K)

Oxygen  delta moles = 5.49132e-05  delta grams = 0.00175716
G = -15.99 (J)  H = 1.80 (J)  S = 0.01 (J/K)  V = 5.86 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1000.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.17  COH = 1.84 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.63 (gm)  density = 2.44 (gm/cc)  viscosity = 6.73 (log 10 poise)  (analysis in wt %)
G = -1516897.20 (J)  H = -1217106.57 (J)  S = 235.47 (J/K)  V = 38.38 (cc)  Cp = 123.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.05 | 0.43 | 13.56 | 0.52 | 0.00 | 2.09 | 0.06 | 0.32 | 0.00 | 0.00 | 1.23 | 2.86 | 5.75 | 0.06 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.11 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.97Mg0.93Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -14810.76 (J)  H = -11764.16 (J)  S = 2.39 (J/K)  V = 0.31 (cc)  Cp = 1.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.98 | 97.45 | 97.26 | 3.83 | -3.71 | 6.84 | 0.32 |

quartz  mass = 5.27 (gm)  density = 2.55 (gm/cc)
SiO2
G = -87916.88 (J)  H = -73043.89 (J)  S = 11.68 (J/K)  V = 2.06 (cc)  Cp = 6.25 (J/K)

Total solids  mass = 6.38 (gm)  density = 2.68 (gm/cc)
G = -102727.64 (J)  H = -84808.06 (J)  S = 14.07 (J/K)  V = 2.38 (cc)  Cp = 7.53 (J/K)

Viscosity of the System: 6.84 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1619624.84 (J)  H = -1301914.63 (J)  S = 249.55 (J/K)  V = 40.76 (cc)  Cp = 130.75 (J/K)

Oxygen  delta moles = 2.26977e-05  delta grams = 0.000726299
G = -6.55 (J)  H = 0.73 (J)  S = 0.01 (J/K)  V = 2.40 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 990.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.16  COH = 1.82  IW

= 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 92.55 (gm) density = 2.44 (gm/cc) viscosity = 6.81 (log 10 poise) (analysis in wt %)
G = -1497706.54 (J) H = -1204678.78 (J) S = 231.98 (J/K) V = 37.93 (cc) Cp = 121.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.88 | 0.43 | 13.71 | 0.51 | 0.00 | 2.02 | 0.07 | 0.29 | 0.00 | 0.00 | 1.24 | 2.89 | 5.82 | 0.07 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.38 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.89Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -18287.49 (J) H = -14544.60 (J) S = 2.96 (J/K) V = 0.39 (cc) Cp = 1.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.38 | 97.40 | 100.29 | 4.07 | -3.95 | 7.24 | 0.33 |

quartz mass = 6.07 (gm) density = 2.55 (gm/cc)
SiO2
G = -101122.72 (J) H = -84199.23 (J) S = 13.40 (J/K) V = 2.38 (cc) Cp = 7.20 (J/K)

Total solids mass = 7.45 (gm) density = 2.69 (gm/cc)
G = -119410.21 (J) H = -98743.83 (J) S = 16.36 (J/K) V = 2.76 (cc) Cp = 8.78 (J/K)

Viscosity of the System: 6.94 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1617116.75 (J) H = -1303422.61 (J) S = 248.34 (J/K) V = 40.69 (cc) Cp = 130.60 (J/K)

Oxygen delta moles = -1.16625e-05 delta grams = -0.000373186
G = 3.34 (J) H = -0.37 (J) S = -0.00 (J/K) V = -1.22 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 980.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.15 COH = 1.80 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 86.59 (gm) density = 2.44 (gm/cc) viscosity = 6.84 (log 10 poise) (analysis in wt %)
G = -1398909.29 (J) H = -1127575.55 (J) S = 216.52 (J/K) V = 35.50 (cc) Cp = 113.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.72 | 0.46 | 13.74 | 0.51 | 0.00 | 2.01 | 0.07 | 0.25 | 0.00 | 0.00 | 1.25 | 2.78 | 5.97 | 0.07 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.81 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.84Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -23646.58 (J) H = -18817.57 (J) S = 3.85 (J/K) V = 0.51 (cc) Cp = 2.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.42 | 97.43 | 104.92 | 4.20 | -4.07 | 7.62 | 0.32 |

feldspar mass = 3.80 (gm) density = 2.55 (gm/cc) (analysis in mole %)

K0.32Na0.60Ca0.08Al1.08Si2.92O8
G = -62261.58 (J) H = -51168.64 (J) S = 8.85 (J/K) V = 1.49 (cc) Cp = 4.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.33 | 7.71 | 31.97 |

quartz mass = 7.80 (gm) density = 2.55 (gm/cc)
SiO2
G = -129785.55 (J) H = -108300.69 (J) S = 17.14 (J/K) V = 3.05 (cc) Cp = 9.24 (J/K)

Total solids mass = 13.41 (gm) density = 2.65 (gm/cc)
G = -215693.71 (J) H = -178286.90 (J) S = 29.85 (J/K) V = 5.05 (cc) Cp = 15.91 (J/K)

Viscosity of the System: 7.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1614603.00 (J) H = -1305862.44 (J) S = 246.37 (J/K) V = 40.55 (cc) Cp = 129.85 (J/K)

Oxygen delta moles = -8.4718e-05 delta grams = -0.00271088
G = 24.02 (J) H = -2.68 (J) S = -0.02 (J/K) V = -8.83 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 970.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.15 COH = 1.77 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 79.23 (gm) density = 2.44 (gm/cc) viscosity = 6.84 (log 10 poise) (analysis in wt %)
G = -1278110.09 (J) H = -1032181.38 (J) S = 197.83 (J/K) V = 32.50 (cc) Cp = 104.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.56 | 0.51 | 13.75 | 0.52 | 0.00 | 2.01 | 0.08 | 0.22 | 0.00 | 0.00 | 1.29 | 2.67 | 6.06 | 0.08 | 1.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.25 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.79Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -29113.93 (J) H = -23181.73 (J) S = 4.77 (J/K) V = 0.63 (cc) Cp = 2.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.44 | 97.42 | 109.55 | 4.31 | -4.17 | 8.01 | 0.31 |

feldspar mass = 8.78 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.38Na0.56Ca0.06Al1.06Si2.94O8
G = -143041.00 (J) H = -117803.29 (J) S = 20.30 (J/K) V = 3.45 (cc) Cp = 10.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.69 | 6.46 | 37.85 |

quartz mass = 9.74 (gm) density = 2.55 (gm/cc)
SiO2
G = -161839.53 (J) H = -135342.01 (J) S = 21.31 (J/K) V = 3.81 (cc) Cp = 11.53 (J/K)

Total solids mass = 20.77 (gm) density = 2.63 (gm/cc)
G = -333994.47 (J) H = -276327.04 (J) S = 46.39 (J/K) V = 7.89 (cc) Cp = 24.68 (J/K)

Viscosity of the System: 7.27 (log 10 poise)

System mass = 99.99 (gm) density = 2.48 (gm/cc)
G = -1612104.56 (J) H = -1308508.42 (J) S = 244.22 (J/K) V = 40.39 (cc) Cp = 128.95 (J/K)

Oxygen delta moles = -0.000169423 delta grams = -0.00542132
G = 47.62 (J) H = -5.30 (J) S = -0.04 (J/K) V = -17.51 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 72.47 (gm) density = 2.44 (gm/cc) viscosity = 6.83 (log 10 poise) (analysis in wt %)
G = -1167697.70 (J) H = -944789.02 (J) S = 180.76 (J/K) V = 29.74 (cc) Cp = 95.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.40 | 0.55 | 13.76 | 0.52 | 0.00 | 2.00 | 0.08 | 0.20 | 0.00 | 0.00 | 1.34 | 2.57 | 6.11 | 0.08 | 1.38 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.67 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.75Fe"'0.04Ti0.00Al0.13Si1.91O6
G = -34061.86 (J) H = -27144.21 (J) S = 5.61 (J/K) V = 0.74 (cc) Cp = 2.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -119.89 | 97.40 | 113.65 | 4.43 | -4.28 | 8.37 | 0.30 |

feldspar mass = 13.35 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.41Na0.53Ca0.06Al1.06Si2.94O8
G = -216955.60 (J) H = -179078.51 (J) S = 30.72 (J/K) V = 5.25 (cc) Cp = 16.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 52.93 | 5.99 | 41.08 |

quartz mass = 11.50 (gm) density = 2.55 (gm/cc)
SiO2
G = -190913.31 (J) H = -160001.85 (J) S = 25.07 (J/K) V = 4.50 (cc) Cp = 13.61 (J/K)

Total solids mass = 27.52 (gm) density = 2.62 (gm/cc)
G = -441930.77 (J) H = -366224.57 (J) S = 61.39 (J/K) V = 10.49 (cc) Cp = 32.69 (J/K)

Viscosity of the System: 7.47 (log 10 poise)

System mass = 99.99 (gm) density = 2.49 (gm/cc)
G = -1609628.47 (J) H = -1311013.59 (J) S = 242.16 (J/K) V = 40.24 (cc) Cp = 128.10 (J/K)

Oxygen delta moles = -0.000251958 delta grams = -0.00806235
G = 70.18 (J) H = -7.79 (J) S = -0.06 (J/K) V = -25.83 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW

= 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 66.45 (gm) density = 2.43 (gm/cc) viscosity = 6.81 (log 10 poise) (analysis in wt %)
G = -1069693.52 (J) H = -867113.03 (J) S = 165.62 (J/K) V = 27.29 (cc) Cp = 87.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.25 | 0.60 | 13.78 | 0.51 | 0.00 | 1.98 | 0.09 | 0.18 | 0.00 | 0.00 | 1.39 | 2.49 | 6.13 | 0.09 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.05 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.17Mg0.71Fe"'0.04Ti0.00Al0.14Si1.91O6
G = -38517.43 (J) H = -30728.52 (J) S = 6.37 (J/K) V = 0.84 (cc) Cp = 3.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -123.78 | 97.37 | 117.25 | 4.55 | -4.37 | 8.69 | 0.29 |

feldspar mass = 17.42 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.43Na0.51Ca0.06Al1.06Si2.94O8
G = -282259.23 (J) H = -233515.15 (J) S = 39.85 (J/K) V = 6.85 (cc) Cp = 20.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 51.08 | 5.81 | 43.11 |

quartz mass = 13.07 (gm) density = 2.55 (gm/cc)
SiO2
G = -216704.25 (J) H = -182009.74 (J) S = 28.36 (J/K) V = 5.12 (cc) Cp = 15.45 (J/K)

Total solids mass = 33.54 (gm) density = 2.62 (gm/cc)
G = -537480.90 (J) H = -446253.41 (J) S = 74.58 (J/K) V = 12.81 (cc) Cp = 39.80 (J/K)

Viscosity of the System: 7.70 (log 10 poise)

System mass = 99.99 (gm) density = 2.49 (gm/cc)
G = -1607174.42 (J) H = -1313366.44 (J) S = 240.21 (J/K) V = 40.10 (cc) Cp = 127.34 (J/K)

Oxygen delta moles = -0.000330869 delta grams = -0.0105874
G = 91.33 (J) H = -10.12 (J) S = -0.08 (J/K) V = -33.65 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 61.12 (gm) density = 2.43 (gm/cc) viscosity = 6.80 (log 10 poise) (analysis in wt %)
G = -983044.74 (J) H = -798359.84 (J) S = 152.24 (J/K) V = 25.12 (cc) Cp = 80.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.65 | 13.80 | 0.51 | 0.00 | 1.94 | 0.10 | 0.16 | 0.00 | 0.00 | 1.45 | 2.42 | 6.14 | 0.10 | 1.64 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.40 (gm) density = 3.64 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.20Mg0.68Fe"'0.05Ti0.00Al0.14Si1.91O6
G = -42520.82 (J) H = -33967.68 (J) S = 7.05 (J/K) V = 0.93 (cc) Cp = 3.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -127.15 | 97.34 | 120.37 | 4.66 | -4.46 | 8.96 | 0.28 |

feldspar mass = 21.00 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.45Na0.50Ca0.06Al1.06Si2.94O8
G = -339636.85 (J) H = -281631.87 (J) S = 47.81 (J/K) V = 8.26 (cc) Cp = 25.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.72 | 5.75 | 44.53 |

quartz mass = 14.47 (gm) density = 2.55 (gm/cc)
SiO2
G = -239539.25 (J) H = -201622.91 (J) S = 31.25 (J/K) V = 5.66 (cc) Cp = 17.09 (J/K)

Total solids mass = 38.87 (gm) density = 2.62 (gm/cc)
G = -621696.92 (J) H = -517222.46 (J) S = 86.12 (J/K) V = 14.86 (cc) Cp = 46.08 (J/K)

Viscosity of the System: 7.98 (log 10 poise)

System mass = 99.99 (gm) density = 2.50 (gm/cc)
G = -1604741.66 (J) H = -1315582.30 (J) S = 238.35 (J/K) V = 39.98 (cc) Cp = 126.64 (J/K)

Oxygen delta moles = -0.000405627 delta grams = -0.0129796
G = 110.95 (J) H = -12.26 (J) S = -0.10 (J/K) V = -40.91 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 56.39 (gm) density = 2.43 (gm/cc) viscosity = 6.78 (log 10 poise) (analysis in wt %)
G = -906279.07 (J) H = -737382.76 (J) S = 140.38 (J/K) V = 23.20 (cc) Cp = 74.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.95 | 0.71 | 13.82 | 0.50 | 0.00 | 1.89 | 0.11 | 0.14 | 0.00 | 0.00 | 1.50 | 2.36 | 6.15 | 0.11 | 1.78 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.72 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.23Mg0.65Fe"'0.05Ti0.00Al0.14Si1.91O6
G = -46108.18 (J) H = -36890.70 (J) S = 7.66 (J/K) V = 1.02 (cc) Cp = 4.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -130.05 | 97.30 | 123.07 | 4.76 | -4.54 | 9.19 | 0.28 |

feldspar mass = 24.17 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.46Na0.49Ca0.06Al1.06Si2.94O8
G = -390121.81 (J) H = -324241.48 (J) S = 54.76 (J/K) V = 9.50 (cc) Cp = 29.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.65 | 5.76 | 45.59 |

quartz mass = 15.71 (gm) density = 2.55 (gm/cc)

SiO2
G = -259820.33 (J)  H = -219164.33 (J)  S = 33.79 (J/K)  V = 6.15 (cc)  Cp = 18.54 (J/K)

Total solids  mass = 43.60 (gm)  density = 2.61 (gm/cc)
G = -696050.31 (J)  H = -580296.50 (J)  S = 96.21 (J/K)  V = 16.67 (cc)  Cp = 51.64 (J/K)

Viscosity of the System: 8.35 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.51 (gm/cc)
G = -1602329.38 (J)  H = -1317679.27 (J)  S = 236.59 (J/K)  V = 39.87 (cc)  Cp = 126.02 (J/K)

Oxygen  delta moles = -0.000475992  delta grams = -0.0152312
G = 129.00 (J)  H = -14.21 (J)  S = -0.12 (J/K)  V = -47.62 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 920.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = 0.11  COH = 1.65  IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 51.35 (gm)  density = 2.42 (gm/cc)  viscosity = 6.77 (log 10 poise)  (analysis in wt %)
G = -826352.31 (J)  H = -673731.60 (J)  S = 127.91 (J/K)  V = 21.19 (cc)  Cp = 67.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.01 | 0.66 | 13.88 | 0.44 | 0.00 | 1.65 | 0.12 | 0.15 | 0.00 | 0.00 | 1.53 | 2.30 | 6.18 | 0.12 | 1.95 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.39 (gm)  density = 3.63 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.18Mg0.70Fe'''0.04Ti0.00Al0.14Si1.91O6
G = -42522.85 (J)  H = -34193.84 (J)  S = 6.98 (J/K)  V = 0.93 (cc)  Cp = 3.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -124.68 | 97.18 | 118.41 | 4.79 | -4.59 | 8.61 | 0.27 |

feldspar  mass = 24.82 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.49Na0.46Ca0.05Al1.05Si2.95O8
G = -399355.22 (J)  H = -332665.53 (J)  S = 55.89 (J/K)  V = 9.77 (cc)  Cp = 29.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.73 | 5.13 | 49.14 |

feldspar  mass = 2.59 (gm)  density = 2.58 (gm/cc)  (analysis in mole %)
K0.20Na0.65Ca0.16Al1.16Si2.84O8
G = -42315.44 (J)  H = -35303.24 (J)  S = 5.88 (J/K)  V = 1.00 (cc)  Cp = 3.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.83 | 15.51 | 19.66 |

quartz  mass = 17.31 (gm)  density = 2.55 (gm/cc)
SiO2
G = -285794.77 (J)  H = -241591.74 (J)  S = 37.05 (J/K)  V = 6.78 (cc)  Cp = 20.41 (J/K)

spinel  mass = 0.54 (gm)  density = 4.87 (gm/cc)  (analysis in mole %)
Fe"1.27Mg0.05Fe'''1.23Al0.13Cr0.00Ti0.32O4
G = -3918.84 (J)  H = -2674.25 (J)  S = 1.04 (J/K)  V = 0.11 (cc)  Cp = 0.49 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 1.03 61.29 5.34 32.34

Total solids mass = 48.65 (gm) density = 2.62 (gm/cc)
G = -773907.12 (J) H = -646428.61 (J) S = 106.84 (J/K) V = 18.59 (cc) Cp = 57.50 (J/K)

Viscosity of the System: 9.14 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1600259.44 (J) H = -1320160.20 (J) S = 234.76 (J/K) V = 39.79 (cc) Cp = 125.32 (J/K)

Oxygen delta moles = 6.05947e-05 delta grams = 0.00193896
G = -16.27 (J) H = 1.79 (J) S = 0.02 (J/K) V = 6.01 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 47.31 (gm) density = 2.42 (gm/cc) viscosity = 6.74 (log 10 poise) (analysis in wt %)
G = -761334.79 (J) H = -621870.17 (J) S = 117.88 (J/K) V = 19.56 (cc) Cp = 62.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.95 | 0.66 | 13.91 | 0.42 | 0.00 | 1.54 | 0.13 | 0.15 | 0.00 | 0.00 | 1.55 | 2.26 | 6.19 | 0.13 | 2.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.41 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.18Mg0.70Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -42745.81 (J) H = -34478.56 (J) S = 6.99 (J/K) V = 0.94 (cc) Cp = 3.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -123.98 | 97.16 | 117.87 | 4.85 | -4.65 | 8.48 | 0.27 |

feldspar mass = 25.76 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.52Na0.43Ca0.05Al1.05Si2.95O8
G = -413295.41 (J) H = -345062.02 (J) S = 57.67 (J/K) V = 10.14 (cc) Cp = 30.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 43.48 | 4.65 | 51.87 |

feldspar mass = 4.30 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.18Na0.65Ca0.17Al1.17Si2.83O8
G = -70338.52 (J) H = -58829.13 (J) S = 9.73 (J/K) V = 1.67 (cc) Cp = 5.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.34 | 16.81 | 17.85 |

quartz mass = 18.49 (gm) density = 2.55 (gm/cc)
SiO2
G = -305014.90 (J) H = -258391.03 (J) S = 39.41 (J/K) V = 7.24 (cc) Cp = 21.79 (J/K)

spinel mass = 0.73 (gm) density = 4.87 (gm/cc) (analysis in mole %)
Fe"1.28Mg0.05Fe'"1.21Al0.12Cr0.00Ti0.33O4
G = -5266.15 (J) H = -3611.83 (J) S = 1.40 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 0.83 60.42 5.35 33.40

Total solids mass = 52.70 (gm) density = 2.62 (gm/cc)
G = -836660.80 (J) H = -700372.57 (J) S = 115.19 (J/K) V = 20.14 (cc) Cp = 62.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.52 (gm/cc)
G = -1597995.59 (J) H = -1322242.74 (J) S = 233.07 (J/K) V = 39.70 (cc) Cp = 124.75 (J/K)

Oxygen delta moles = 0.000202253 delta grams = 0.00647186
G = -53.80 (J) H = 5.90 (J) S = 0.05 (J/K) V = 19.90 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 900.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.09 COH = 1.60 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 43.68 (gm) density = 2.41 (gm/cc) viscosity = 6.71 (log 10 poise) (analysis in wt %)
G = -703025.67 (J) H = -575273.28 (J) S = 108.90 (J/K) V = 18.10 (cc) Cp = 57.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.87 | 0.66 | 13.93 | 0.39 | 0.00 | 1.43 | 0.14 | 0.15 | 0.00 | 0.00 | 1.57 | 2.23 | 6.19 | 0.14 | 2.30 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.42 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.17Mg0.71Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -42872.34 (J) H = -34686.25 (J) S = 6.98 (J/K) V = 0.94 (cc) Cp = 3.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -123.30 | 97.15 | 117.32 | 4.92 | -4.71 | 8.36 | 0.27 |

feldspar mass = 26.78 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.54Na0.42Ca0.04Al1.04Si2.96O8
G = -428584.42 (J) H = -358644.91 (J) S = 59.62 (J/K) V = 10.55 (cc) Cp = 31.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.57 | 4.26 | 54.18 |

feldspar mass = 5.66 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.66Ca0.18Al1.18Si2.82O8
G = -92501.95 (J) H = -77556.07 (J) S = 12.74 (J/K) V = 2.19 (cc) Cp = 6.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.68 | 17.92 | 16.40 |

quartz mass = 19.57 (gm) density = 2.55 (gm/cc)
SiO2
G = -322317.37 (J) H = -273631.51 (J) S = 41.50 (J/K) V = 7.66 (cc) Cp = 23.03 (J/K)

spinel mass = 0.89 (gm) density = 4.87 (gm/cc) (analysis in mole %)
Fe"1.29Mg0.05Fe'"1.19Al0.12Cr0.00Ti0.34O4
G = -6432.50 (J) H = -4434.12 (J) S = 1.70 (J/K) V = 0.18 (cc) Cp = 0.80 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 0.62 59.53 5.36 34.49

Total solids mass = 56.33 (gm) density = 2.62 (gm/cc)
G = -892708.58 (J) H = -748952.85 (J) S = 122.54 (J/K) V = 21.53 (cc) Cp = 66.43 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.52 (gm/cc)
G = -1595734.25 (J) H = -1324226.14 (J) S = 231.44 (J/K) V = 39.63 (cc) Cp = 124.23 (J/K)

Oxygen delta moles = 0.000317546 delta grams = 0.0101611
G = -83.68 (J) H = 9.14 (J) S = 0.08 (J/K) V = 30.97 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 40.41 (gm) density = 2.41 (gm/cc) viscosity = 6.67 (log 10 poise) (analysis in wt %)
G = -650446.12 (J) H = -533175.27 (J) S = 100.82 (J/K) V = 16.78 (cc) Cp = 53.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.79 | 0.66 | 13.96 | 0.37 | 0.00 | 1.34 | 0.15 | 0.14 | 0.00 | 0.00 | 1.58 | 2.21 | 6.18 | 0.15 | 2.48 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.42 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.17Mg0.72Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -42924.27 (J) H = -34833.81 (J) S = 6.96 (J/K) V = 0.94 (cc) Cp = 3.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -122.64 | 97.15 | 116.76 | 4.98 | -4.77 | 8.25 | 0.26 |

feldspar mass = 27.78 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.56Na0.40Ca0.04Al1.04Si2.96O8
G = -443483.57 (J) H = -371962.02 (J) S = 61.49 (J/K) V = 10.95 (cc) Cp = 33.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 39.90 | 3.93 | 56.18 |

feldspar mass = 6.81 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.15Na0.66Ca0.19Al1.19Si2.81O8
G = -111197.30 (J) H = -93456.70 (J) S = 15.25 (J/K) V = 2.63 (cc) Cp = 8.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.92 | 18.88 | 15.20 |

quartz mass = 20.55 (gm) density = 2.55 (gm/cc)
SiO2
G = -337977.43 (J) H = -287536.87 (J) S = 43.37 (J/K) V = 8.04 (cc) Cp = 24.16 (J/K)

spinel mass = 1.03 (gm) density = 4.87 (gm/cc) (analysis in mole %)
Fe"1.30Mg0.05Fe'"1.17Al0.12Cr0.00Ti0.36O4
G = -7448.62 (J) H = -5160.58 (J) S = 1.97 (J/K) V = 0.21 (cc) Cp = 0.93 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 0.42 58.63 5.37 35.58

Total solids mass = 59.60 (gm) density = 2.62 (gm/cc)
G = -943031.18 (J) H = -792949.98 (J) S = 129.03 (J/K) V = 22.78 (cc) Cp = 70.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.53 (gm/cc)
G = -1593477.30 (J) H = -1326125.24 (J) S = 229.85 (J/K) V = 39.55 (cc) Cp = 123.75 (J/K)

Oxygen delta moles = 0.000410946 delta grams = 0.0131498
G = -107.27 (J) H = 11.69 (J) S = 0.10 (J/K) V = 39.74 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 880.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.07 COH = 1.54 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 37.45 (gm) density = 2.40 (gm/cc) viscosity = 6.62 (log 10 poise) (analysis in wt %)
G = -602784.07 (J) H = -494939.90 (J) S = 93.52 (J/K) V = 15.58 (cc) Cp = 49.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.69 | 0.66 | 13.98 | 0.35 | 0.00 | 1.25 | 0.16 | 0.14 | 0.00 | 0.00 | 1.59 | 2.19 | 6.16 | 0.16 | 2.68 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.42 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.16Mg0.72Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -42919.39 (J) H = -34935.07 (J) S = 6.92 (J/K) V = 0.94 (cc) Cp = 3.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -122.01 | 97.17 | 116.21 | 5.05 | -4.83 | 8.14 | 0.26 |

feldspar mass = 28.72 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.58Na0.38Ca0.04Al1.04Si2.96O8
G = -457438.24 (J) H = -384544.00 (J) S = 63.21 (J/K) V = 11.32 (cc) Cp = 34.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.41 | 3.64 | 57.95 |

feldspar mass = 7.82 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.14Na0.66Ca0.20Al1.20Si2.80O8
G = -127520.24 (J) H = -107432.23 (J) S = 17.42 (J/K) V = 3.01 (cc) Cp = 9.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.11 | 19.71 | 14.18 |

quartz mass = 21.44 (gm) density = 2.55 (gm/cc)
SiO2
G = -352225.53 (J) H = -300294.58 (J) S = 45.03 (J/K) V = 8.39 (cc) Cp = 25.19 (J/K)

spinel mass = 1.16 (gm) density = 4.87 (gm/cc) (analysis in mole %)
Fe"1.31Mg0.05Fe'"1.15Al0.11Cr0.00Ti0.37O4
G = -8338.76 (J) H = -5806.53 (J) S = 2.20 (J/K) V = 0.24 (cc) Cp = 1.04 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 0.22 57.71 5.39 36.67

Total solids mass = 62.56 (gm) density = 2.62 (gm/cc)
G = -988442.15 (J) H = -833012.41 (J) S = 134.79 (J/K) V = 23.91 (cc) Cp = 73.64 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.53 (gm/cc)
G = -1591226.23 (J) H = -1327952.31 (J) S = 228.31 (J/K) V = 39.49 (cc) Cp = 123.30 (J/K)

Oxygen delta moles = 0.00048603 delta grams = 0.0155524
G = -125.67 (J) H = 13.65 (J) S = 0.12 (J/K) V = 46.60 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: akosite

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 34.57 (gm) density = 2.40 (gm/cc) viscosity = 6.56 (log 10 poise) (analysis in wt %)
G = -556400.94 (J) H = -457552.82 (J) S = 86.47 (J/K) V = 14.42 (cc) Cp = 45.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.60 | 0.58 | 13.99 | 0.34 | 0.00 | 1.21 | 0.17 | 0.13 | 0.00 | 0.00 | 1.59 | 2.20 | 6.11 | 0.17 | 2.90 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.58 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.18Mg0.70Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -44678.75 (J) H = -36437.39 (J) S = 7.21 (J/K) V = 0.99 (cc) Cp = 3.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -124.17 | 97.24 | 118.17 | 5.16 | -4.96 | 8.31 | 0.25 |

feldspar mass = 29.74 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.60Na0.37Ca0.03Al1.03Si2.97O8
G = -472511.77 (J) H = -398124.34 (J) S = 65.07 (J/K) V = 11.72 (cc) Cp = 35.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.97 | 3.38 | 59.65 |

feldspar mass = 8.69 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.66Ca0.21Al1.21Si2.79O8
G = -141549.14 (J) H = -119535.68 (J) S = 19.26 (J/K) V = 3.34 (cc) Cp = 10.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.21 | 20.55 | 13.24 |

quartz mass = 22.24 (gm) density = 2.55 (gm/cc)
SiO2
G = -364884.69 (J) H = -311745.72 (J) S = 46.48 (J/K) V = 8.71 (cc) Cp = 26.10 (J/K)

spinel mass = 1.04 (gm) density = 4.88 (gm/cc) (analysis in mole %)
Fe"1.30Mg0.05Fe'"1.19Al0.11Cr0.00Ti0.35O4
G = -7432.50 (J) H = -5187.80 (J) S = 1.96 (J/K) V = 0.21 (cc) Cp = 0.93 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 0.64 59.53 5.03 34.81

rhm-oxide mass = 0.15 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.74Mg0.07Fe'"0.22Al0.10Ti0.84O3
G = -1447.40 (J) H = -1124.94 (J) S = 0.28 (J/K) V = 0.03 (cc) Cp = 0.14 (J/K)
geikielite hematite ilmenite pyrophanite corundum
7.30 10.92 74.45 2.35 4.98

Total solids mass = 65.44 (gm) density = 2.62 (gm/cc)
G = -1032504.26 (J) H = -872155.87 (J) S = 140.27 (J/K) V = 25.00 (cc) Cp = 76.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.54 (gm/cc)
G = -1588905.20 (J) H = -1329708.69 (J) S = 226.74 (J/K) V = 39.42 (cc) Cp = 122.86 (J/K)

Oxygen delta moles = 0.000399206 delta grams = 0.0127741
G = -102.23 (J) H = 11.07 (J) S = 0.10 (J/K) V = 37.94 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 860.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.06 COH = 1.48 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 32.02 (gm) density = 2.39 (gm/cc) viscosity = 6.49 (log 10 poise) (analysis in wt %)
G = -515268.03 (J) H = -424365.25 (J) S = 80.22 (J/K) V = 13.38 (cc) Cp = 42.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.49 | 0.54 | 14.00 | 0.33 | 0.00 | 1.16 | 0.18 | 0.12 | 0.00 | 0.00 | 1.60 | 2.20 | 6.06 | 0.19 | 3.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.68 (gm) density = 3.64 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.19Mg0.69Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -45742.07 (J) H = -37391.47 (J) S = 7.37 (J/K) V = 1.01 (cc) Cp = 4.06 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-125.34 97.30 119.21 5.27 -5.07 8.38 0.25

feldspar mass = 30.61 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.03Al1.03Si2.97O8
G = -485275.30 (J) H = -409812.09 (J) S = 66.60 (J/K) V = 12.06 (cc) Cp = 36.30 (J/K)
albite anorthite sanidine
35.70 3.15 61.15

feldspar mass = 9.49 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.66Ca0.21Al1.21Si2.79O8
G = -154441.24 (J) H = -130730.06 (J) S = 20.93 (J/K) V = 3.65 (cc) Cp = 11.47 (J/K)
albite anorthite sanidine
66.32 21.24 12.44

quartz mass = 22.98 (gm) density = 2.55 (gm/cc)

SiO2
G = -376533.04 (J)  H = -322376.57 (J)  S = 47.79 (J/K)  V = 9.00 (cc)  Cp = 26.94 (J/K)

spinel  mass = 1.01 (gm)  density = 4.89 (gm/cc)  (analysis in mole %)
Fe"1.29Mg0.05Fe'''1.21Al0.11Cr0.00Ti0.34O4
G = -7134.57 (J)  H = -4996.76 (J)  S = 1.89 (J/K)  V = 0.21 (cc)  Cp = 0.90 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.82 | 60.34 | 4.81 | 34.03 |

rhm-oxide  mass = 0.23 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.02Fe"0.75Mg0.07Fe'''0.22Al0.10Ti0.84O3
G = -2231.31 (J)  H = -1739.70 (J)  S = 0.43 (J/K)  V = 0.05 (cc)  Cp = 0.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.11 | 10.77 | 74.78 | 2.42 | 4.92 |

Total solids  mass = 67.99 (gm)  density = 2.62 (gm/cc)
G = -1071357.53 (J)  H = -907046.64 (J)  S = 145.00 (J/K)  V = 25.98 (cc)  Cp = 79.89 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.01 (gm)  density = 2.54 (gm/cc)
G = -1586625.56 (J)  H = -1331411.88 (J)  S = 225.22 (J/K)  V = 39.36 (cc)  Cp = 122.46 (J/K)

Oxygen  delta moles = 0.000361743  delta grams = 0.0115754
G = -91.73 (J)  H = 9.90 (J)  S = 0.09 (J/K)  V = 34.08 (cc)  Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 850.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.84  delta HM = -5.08  NNO = 0.00  QFM = 0.05  COH = 1.46  IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid  mass = 29.68 (gm)  density = 2.39 (gm/cc)  viscosity = 6.41 (log 10 poise)  (analysis in wt %)
G = -477639.80 (J)  H = -393942.48 (J)  S = 74.52 (J/K)  V = 12.43 (cc)  Cp = 39.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.35 | 0.49 | 14.02 | 0.32 | 0.00 | 1.11 | 0.19 | 0.11 | 0.00 | 0.00 | 1.60 | 2.21 | 6.01 | 0.20 | 3.38 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.78 (gm)  density = 3.65 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.20Mg0.68Fe'''0.03Ti0.00Al0.14Si1.91O6
G = -46778.70 (J)  H = -38327.99 (J)  S = 7.52 (J/K)  V = 1.04 (cc)  Cp = 4.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -126.52 | 97.38 | 120.25 | 5.37 | -5.18 | 8.47 | 0.24 |

feldspar  mass = 31.40 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.63Na0.35Ca0.03Al1.03Si2.97O8
G = -496748.72 (J)  H = -420457.25 (J)  S = 67.93 (J/K)  V = 12.37 (cc)  Cp = 37.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.54 | 2.94 | 62.52 |

feldspar  mass = 10.22 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.12Na0.66Ca0.22Al1.22Si2.78O8
G = -166241.04 (J) H = -141046.72 (J) S = 22.43 (J/K) V = 3.93 (cc) Cp = 12.35 (J/K)
albite anorthite sanidine
66.43 21.84 11.72

quartz mass = 23.66 (gm) density = 2.55 (gm/cc)
SiO2
G = -387209.97 (J) H = -332215.36 (J) S = 48.96 (J/K) V = 9.26 (cc) Cp = 27.71 (J/K)

spinel mass = 0.97 (gm) density = 4.89 (gm/cc) (analysis in mole %)
Fe"1.29Mg0.05Fe'''1.22Al0.11Cr0.00Ti0.33O4
G = -6813.93 (J) H = -4788.52 (J) S = 1.80 (J/K) V = 0.20 (cc) Cp = 0.86 (J/K)
chromite hercynite magnetite spinel ulvospinel
0.00 0.99 61.16 4.60 33.25

rhm-oxide mass = 0.31 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.75Mg0.07Fe'''0.21Al0.10Ti0.85O3
G = -2925.69 (J) H = -2288.32 (J) S = 0.57 (J/K) V = 0.07 (cc) Cp = 0.29 (J/K)
geikielite hematite ilmenite pyrophanite corundum
6.92 10.62 75.11 2.48 4.87

Total solids mass = 70.33 (gm) density = 2.62 (gm/cc)
G = -1106718.05 (J) H = -939124.17 (J) S = 149.22 (J/K) V = 26.86 (cc) Cp = 82.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.54 (gm/cc)
G = -1584357.85 (J) H = -1333066.65 (J) S = 223.74 (J/K) V = 39.30 (cc) Cp = 122.08 (J/K)

Oxygen delta moles = 0.000318392 delta grams = 0.0101882
G = -79.95 (J) H = 8.60 (J) S = 0.08 (J/K) V = 29.73 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 27.53 (gm) density = 2.38 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -443050.57 (J) H = -365915.98 (J) S = 69.29 (J/K) V = 11.56 (cc) Cp = 36.72 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.19 0.45 14.04 0.31 0.00 1.06 0.20 0.11 0.00 0.00 1.60 2.23 5.94 0.22 3.64 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.88 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.21Mg0.67Fe'''0.03Ti0.00Al0.14Si1.91O6
G = -47796.66 (J) H = -39253.42 (J) S = 7.67 (J/K) V = 1.06 (cc) Cp = 4.25 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-127.72 97.46 121.29 5.49 -5.31 8.55 0.23

feldspar mass = 32.11 (gm) density = 2.54 (gm/cc) (analysis in mole %)

K0.64Na0.33Ca0.03Al1.03Si2.97O8
G = -507059.76 (J) H = -430160.55 (J) S = 69.08 (J/K) V = 12.66 (cc) Cp = 38.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.47 | 2.74 | 63.79 |

feldspar mass = 10.90 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.67Ca0.22Al1.22Si2.78O8
G = -177131.29 (J) H = -150634.43 (J) S = 23.80 (J/K) V = 4.19 (cc) Cp = 13.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.55 | 22.37 | 11.08 |

quartz mass = 24.29 (gm) density = 2.55 (gm/cc)
SiO2
G = -397047.32 (J) H = -341370.11 (J) S = 50.02 (J/K) V = 9.51 (cc) Cp = 28.42 (J/K)

spinel mass = 0.92 (gm) density = 4.90 (gm/cc) (analysis in mole %)
Fe"1.28Mg0.04Fe'''1.24Al0.11Cr0.00Ti0.32O4
G = -6474.51 (J) H = -4565.70 (J) S = 1.71 (J/K) V = 0.19 (cc) Cp = 0.82 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 1.16 | 61.96 | 4.40 | 32.48 |

rhm-oxide mass = 0.37 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.07Fe'''0.21Al0.10Ti0.85O3
G = -3541.91 (J) H = -2779.06 (J) S = 0.69 (J/K) V = 0.08 (cc) Cp = 0.35 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.74 | 10.46 | 75.45 | 2.53 | 4.82 |

Total solids mass = 72.48 (gm) density = 2.62 (gm/cc)
G = -1139051.45 (J) H = -968763.27 (J) S = 152.98 (J/K) V = 27.68 (cc) Cp = 85.02 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.55 (gm/cc)
G = -1582102.02 (J) H = -1334679.25 (J) S = 222.27 (J/K) V = 39.24 (cc) Cp = 121.73 (J/K)

Oxygen delta moles = 0.000269513 delta grams = 0.00862411
G = -67.01 (J) H = 7.19 (J) S = 0.07 (J/K) V = 24.94 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: akosite

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 25.25 (gm) density = 2.37 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -406326.24 (J) H = -335871.01 (J) S = 63.87 (J/K) V = 10.64 (cc) Cp = 33.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.16 | 0.40 | 13.74 | 0.31 | 0.00 | 1.04 | 0.21 | 0.10 | 0.00 | 0.00 | 1.61 | 2.42 | 5.79 | 0.24 | 3.97 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.43 (gm) density = 4.00 (gm/cc) (analysis in mole %)

(Ca0.16Fe"0.66Mg0.18)3Al2Si3O12
G = -18783.60 (J) H = -15765.12 (J) S = 2.74 (J/K) V = 0.36 (cc) Cp = 1.52 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.46 | 16.01 | 17.53 |

orthopyroxene mass = 3.39 (gm) density = 3.66 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.22Mg0.67Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -41601.32 (J) H = -34246.56 (J) S = 6.67 (J/K) V = 0.93 (cc) Cp = 3.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -128.37 | 97.46 | 122.23 | 5.30 | -5.13 | 8.27 | 0.24 |

feldspar mass = 33.63 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.33Ca0.03Al1.03Si2.97O8
G = -530153.27 (J) H = -450760.92 (J) S = 71.97 (J/K) V = 13.25 (cc) Cp = 39.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.20 | 2.56 | 64.24 |

feldspar mass = 10.22 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.67Ca0.22Al1.22Si2.78O8
G = -165916.16 (J) H = -141404.51 (J) S = 22.22 (J/K) V = 3.93 (cc) Cp = 12.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.29 | 21.87 | 10.84 |

quartz mass = 24.99 (gm) density = 2.55 (gm/cc)
SiO2
G = -408027.76 (J) H = -351544.42 (J) S = 51.20 (J/K) V = 9.79 (cc) Cp = 29.21 (J/K)

spinel mass = 0.57 (gm) density = 4.91 (gm/cc) (analysis in mole %)
Fe"1.28Mg0.04Fe'"1.26Al0.11Cr0.00Ti0.32O4
G = -3956.77 (J) H = -2799.08 (J) S = 1.05 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 1.13 | 62.79 | 4.21 | 31.87 |

rhm-oxide mass = 0.51 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.07Fe'"0.21Al0.09Ti0.85O3
G = -4871.01 (J) H = -3833.33 (J) S = 0.94 (J/K) V = 0.11 (cc) Cp = 0.48 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.58 | 10.34 | 75.90 | 2.57 | 4.61 |

Total solids mass = 74.74 (gm) density = 2.63 (gm/cc)
G = -1173309.89 (J) H = -1000353.95 (J) S = 156.78 (J/K) V = 28.47 (cc) Cp = 87.55 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1579636.12 (J) H = -1336224.96 (J) S = 220.65 (J/K) V = 39.11 (cc) Cp = 121.29 (J/K)

Oxygen delta moles = -0.000207746 delta grams = -0.00664762
G = 51.14 (J) H = -5.47 (J) S = -0.05 (J/K) V = -19.05 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 820.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.02 COH = 1.37 IW

= 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 23.09 (gm) density = 2.36 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -371607.91 (J) H = -307356.97 (J) S = 58.78 (J/K) V = 9.77 (cc) Cp = 30.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.14 | 0.35 | 13.34 | 0.32 | 0.00 | 1.02 | 0.23 | 0.10 | 0.00 | 0.00 | 1.63 | 2.68 | 5.59 | 0.26 | 4.34 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.13 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.67Mg0.17)3Al2Si3O12
G = -41011.21 (J) H = -34502.88 (J) S = 5.95 (J/K) V = 0.78 (cc) Cp = 3.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.65 | 16.39 | 16.96 |

orthopyroxene mass = 2.81 (gm) density = 3.66 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.23Mg0.66Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -34427.13 (J) H = -28408.17 (J) S = 5.51 (J/K) V = 0.77 (cc) Cp = 3.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -128.89 | 97.44 | 123.15 | 5.04 | -4.88 | 7.90 | 0.24 |

feldspar mass = 35.25 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.33Ca0.02Al1.02Si2.98O8
G = -554929.02 (J) H = -472878.78 (J) S = 75.06 (J/K) V = 13.89 (cc) Cp = 41.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.19 | 2.38 | 64.43 |

feldspar mass = 9.21 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -149291.93 (J) H = -127507.66 (J) S = 19.93 (J/K) V = 3.54 (cc) Cp = 11.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.25 | 21.03 | 10.72 |

quartz mass = 25.67 (gm) density = 2.55 (gm/cc)
SiO2
G = -418618.78 (J) H = -361421.22 (J) S = 52.32 (J/K) V = 10.05 (cc) Cp = 29.98 (J/K)

spinel mass = 0.14 (gm) density = 4.91 (gm/cc) (analysis in mole %)
Fe"1.27Mg0.04Fe'"1.27Al0.10Cr0.00Ti0.31O4
G = -1000.02 (J) H = -709.65 (J) S = 0.27 (J/K) V = 0.03 (cc) Cp = 0.13 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 1.05 | 63.62 | 4.03 | 31.30 |

rhm-oxide mass = 0.66 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.06Fe'"0.20Al0.09Ti0.85O3
G = -6245.22 (J) H = -4929.32 (J) S = 1.20 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.43 | 10.23 | 76.37 | 2.61 | 4.37 |

Total solids mass = 76.88 (gm) density = 2.63 (gm/cc)
G = -1205523.32 (J) H = -1030357.68 (J) S = 160.24 (J/K) V = 29.20 (cc) Cp = 89.93 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1577131.22 (J) H = -1337714.65 (J) S = 219.02 (J/K) V = 38.97 (cc) Cp = 120.84 (J/K)

Oxygen delta moles = -0.000791199 delta grams = -0.0253174
G = 192.81 (J) H = -20.54 (J) S = -0.20 (J/K) V = -71.91 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 21.20 (gm) density = 2.35 (gm/cc) viscosity = 5.78 (log 10 poise) (analysis in wt %)
G = -341228.32 (J) H = -282422.20 (J) S = 54.29 (J/K) V = 9.00 (cc) Cp = 28.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.03 | 0.32 | 13.07 | 0.31 | 0.00 | 0.97 | 0.24 | 0.10 | 0.00 | 0.00 | 1.64 | 2.89 | 5.42 | 0.28 | 4.73 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.19 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.66Mg0.17)3Al2Si3O12
G = -54911.03 (J) H = -46315.87 (J) S = 7.94 (J/K) V = 1.05 (cc) Cp = 4.45 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.31 | 16.67 | 17.02 |

orthopyroxene mass = 2.34 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.22Mg0.68Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -28672.70 (J) H = -23737.73 (J) S = 4.56 (J/K) V = 0.64 (cc) Cp = 2.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -127.12 | 97.45 | 121.81 | 4.87 | -4.72 | 7.49 | 0.24 |

feldspar mass = 36.38 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -571794.97 (J) H = -488339.73 (J) S = 77.05 (J/K) V = 14.34 (cc) Cp = 43.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.90 | 2.21 | 64.89 |

feldspar mass = 8.80 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -142390.81 (J) H = -121877.40 (J) S = 18.94 (J/K) V = 3.38 (cc) Cp = 10.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.00 | 20.52 | 10.48 |

quartz mass = 26.34 (gm) density = 2.55 (gm/cc)
SiO2
G = -428995.36 (J) H = -371149.70 (J) S = 53.41 (J/K) V = 10.31 (cc) Cp = 30.72 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.07Fe'"0.20Al0.08Ti0.86O3
G = -6830.64 (J) H = -5410.57 (J) S = 1.31 (J/K) V = 0.15 (cc) Cp = 0.67 (J/K)

geikielite hematite ilmenite pyrophanite corundum
6.55 9.85 76.70 2.69 4.21

Total solids mass = 78.77 (gm) density = 2.64 (gm/cc)
G = -1233595.50 (J) H = -1056831.00 (J) S = 163.19 (J/K) V = 29.87 (cc) Cp = 92.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1574823.83 (J) H = -1339253.20 (J) S = 217.49 (J/K) V = 38.88 (cc) Cp = 120.48 (J/K)

Oxygen delta moles = -0.00102934 delta grams = -0.0329378
G = 248.31 (J) H = -26.36 (J) S = -0.25 (J/K) V = -92.70 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 19.48 (gm) density = 2.34 (gm/cc) viscosity = 5.59 (log 10 poise) (analysis in wt %)
G = -313716.41 (J) H = -259821.46 (J) S = 50.22 (J/K) V = 8.31 (cc) Cp = 26.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.84 | 0.28 | 12.88 | 0.29 | 0.00 | 0.90 | 0.26 | 0.10 | 0.00 | 0.00 | 1.65 | 3.08 | 5.25 | 0.31 | 5.15 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.87 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.66Mg0.17)3Al2Si3O12
G = -63967.68 (J) H = -54099.18 (J) S = 9.20 (J/K) V = 1.22 (cc) Cp = 5.18 (J/K)
almandine grossular pyrope
65.69 16.90 17.41

orthopyroxene mass = 1.94 (gm) density = 3.64 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.19Mg0.71Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -23865.32 (J) H = -19832.40 (J) S = 3.76 (J/K) V = 0.53 (cc) Cp = 2.12 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-124.05 97.46 119.15 4.73 -4.60 7.06 0.24

feldspar mass = 37.20 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -583613.37 (J) H = -499547.36 (J) S = 78.34 (J/K) V = 14.66 (cc) Cp = 43.95 (J/K)
albite anorthite sanidine
32.43 2.05 65.52

feldspar mass = 8.75 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -141416.89 (J) H = -121308.79 (J) S = 18.74 (J/K) V = 3.36 (cc) Cp = 10.58 (J/K)
albite anorthite sanidine
69.63 20.20 10.17

quartz mass = 26.99 (gm) density = 2.55 (gm/cc)

SiO2
G = -439032.89 (J)  H = -380620.58 (J)  S = 54.43 (J/K)  V = 10.57 (cc)  Cp = 31.44 (J/K)

rhm-oxide  mass = 0.74 (gm)  density = 4.68 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.77Mg0.07Fe'"0.19Al0.08Ti0.87O3
G = -7017.91 (J)  H = -5580.32 (J)  S = 1.34 (J/K)  V = 0.16 (cc)  Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.84 | 9.34 | 76.94 | 2.79 | 4.10 |

Total solids  mass = 80.49 (gm)  density = 2.64 (gm/cc)
G = -1258914.06 (J)  H = -1080988.64 (J)  S = 165.80 (J/K)  V = 30.49 (cc)  Cp = 93.96 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.58 (gm/cc)
G = -1572630.47 (J)  H = -1340810.10 (J)  S = 216.02 (J/K)  V = 38.80 (cc)  Cp = 120.17 (J/K)

Oxygen  delta moles = -0.0010786  delta grams = -0.0345139
G = 257.54 (J)  H = -27.25 (J)  S = -0.27 (J/K)  V = -96.24 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 790.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -14.09  delta HM = -5.14  NNO = 0.00  QFM = -0.01  COH = 1.27  IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid  mass = 17.86 (gm)  density = 2.33 (gm/cc)  viscosity = 5.38 (log 10 poise)  (analysis in wt %)
G = -287852.27 (J)  H = -238512.65 (J)  S = 46.41 (J/K)  V = 7.65 (cc)  Cp = 24.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.57 | 0.25 | 12.69 | 0.28 | 0.00 | 0.84 | 0.28 | 0.10 | 0.00 | 0.00 | 1.66 | 3.29 | 5.08 | 0.34 | 5.61 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 5.47 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.65Mg0.18)3Al2Si3O12
G = -71831.72 (J)  H = -60911.08 (J)  S = 10.27 (J/K)  V = 1.37 (cc)  Cp = 5.81 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.08 | 17.10 | 17.82 |

orthopyroxene  mass = 1.59 (gm)  density = 3.63 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.16Mg0.74Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -19720.66 (J)  H = -16449.29 (J)  S = 3.08 (J/K)  V = 0.44 (cc)  Cp = 1.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -120.99 | 97.47 | 116.49 | 4.60 | -4.47 | 6.65 | 0.24 |

feldspar  mass = 37.91 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -593759.40 (J)  H = -509365.80 (J)  S = 79.38 (J/K)  V = 14.93 (cc)  Cp = 44.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.94 | 1.90 | 66.16 |

feldspar  mass = 8.77 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -141584.50 (J) H = -121717.96 (J) S = 18.69 (J/K) V = 3.37 (cc) Cp = 10.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.25 | 19.89 | 9.86 |

quartz mass = 27.61 (gm) density = 2.55 (gm/cc)
SiO2
G = -448533.59 (J) H = -389660.08 (J) S = 55.38 (J/K) V = 10.81 (cc) Cp = 32.13 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.07Fe'"0.18Al0.08Ti0.87O3
G = -7173.00 (J) H = -5725.34 (J) S = 1.36 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.13 | 8.85 | 77.14 | 2.89 | 3.99 |

Total solids mass = 82.10 (gm) density = 2.64 (gm/cc)
G = -1282602.87 (J) H = -1103829.54 (J) S = 168.15 (J/K) V = 31.08 (cc) Cp = 95.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1570455.14 (J) H = -1342342.19 (J) S = 214.56 (J/K) V = 38.73 (cc) Cp = 119.90 (J/K)

Oxygen delta moles = -0.0011214 delta grams = -0.0358834
G = 265.00 (J) H = -27.93 (J) S = -0.28 (J/K) V = -99.12 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 780.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.02 COH = 1.24 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 16.32 (gm) density = 2.32 (gm/cc) viscosity = 5.15 (log 10 poise) (analysis in wt %)
G = -263266.88 (J) H = -218191.65 (J) S = 42.80 (J/K) V = 7.03 (cc) Cp = 22.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.21 | 0.23 | 12.51 | 0.27 | 0.00 | 0.78 | 0.30 | 0.11 | 0.00 | 0.00 | 1.68 | 3.52 | 4.88 | 0.37 | 6.14 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.99 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.64Mg0.18)3Al2Si3O12
G = -78702.97 (J) H = -66913.10 (J) S = 11.19 (J/K) V = 1.50 (cc) Cp = 6.36 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.49 | 17.29 | 18.22 |

orthopyroxene mass = 1.29 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.77Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -16120.38 (J) H = -13495.72 (J) S = 2.49 (J/K) V = 0.36 (cc) Cp = 1.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.96 | 97.49 | 113.84 | 4.46 | -4.34 | 6.27 | 0.24 |

feldspar mass = 38.53 (gm) density = 2.54 (gm/cc) (analysis in mole %)

K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -602527.90 (J) H = -518038.96 (J) S = 80.22 (J/K) V = 15.18 (cc) Cp = 45.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.43 | 1.76 | 66.81 |

feldspar mass = 8.85 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.20Al1.20Si2.80O8
G = -142732.63 (J) H = -122972.65 (J) S = 18.76 (J/K) V = 3.40 (cc) Cp = 10.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.86 | 19.58 | 9.56 |

quartz mass = 28.21 (gm) density = 2.55 (gm/cc)
SiO2
G = -457645.17 (J) H = -398393.82 (J) S = 56.26 (J/K) V = 11.04 (cc) Cp = 32.78 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.07Fe'"0.17Al0.08Ti0.88O3
G = -7301.23 (J) H = -5849.59 (J) S = 1.38 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.42 | 8.39 | 77.32 | 2.98 | 3.89 |

Total solids mass = 83.64 (gm) density = 2.64 (gm/cc)
G = -1305030.27 (J) H = -1125663.84 (J) S = 170.31 (J/K) V = 31.64 (cc) Cp = 97.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1568297.15 (J) H = -1343855.49 (J) S = 213.11 (J/K) V = 38.67 (cc) Cp = 119.65 (J/K)

Oxygen delta moles = -0.00115886 delta grams = -0.037082
G = 271.01 (J) H = -28.46 (J) S = -0.28 (J/K) V = -101.47 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 14.84 (gm) density = 2.31 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -239592.55 (J) H = -198552.77 (J) S = 39.34 (J/K) V = 6.42 (cc) Cp = 20.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.74 | 0.20 | 12.33 | 0.26 | 0.00 | 0.73 | 0.33 | 0.11 | 0.00 | 0.00 | 1.70 | 3.78 | 4.67 | 0.41 | 6.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.45 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.64Mg0.19)3Al2Si3O12
G = -84752.82 (J) H = -72244.48 (J) S = 11.99 (J/K) V = 1.62 (cc) Cp = 6.84 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.91 | 17.46 | 18.63 |

orthopyroxene mass = 1.04 (gm) density = 3.61 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.11Mg0.80Fe"'0.02Ti0.00Al0.10Si1.94O6
G = -12964.07 (J) H = -10892.66 (J) S = 1.99 (J/K) V = 0.29 (cc) Cp = 1.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.98 | 97.51 | 111.20 | 4.33 | -4.21 | 5.91 | 0.24 |

feldspar mass = 39.09 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -610184.29 (J) H = -525787.69 (J) S = 80.91 (J/K) V = 15.40 (cc) Cp = 46.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.90 | 1.62 | 67.47 |

feldspar mass = 8.98 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.71Ca0.19Al1.19Si2.81O8
G = -144734.31 (J) H = -124968.81 (J) S = 18.95 (J/K) V = 3.45 (cc) Cp = 10.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.47 | 19.28 | 9.26 |

quartz mass = 28.79 (gm) density = 2.55 (gm/cc)
SiO2
G = -466520.98 (J) H = -406953.35 (J) S = 57.10 (J/K) V = 11.27 (cc) Cp = 33.42 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.08Fe"'0.16Al0.08Ti0.88O3
G = -7406.97 (J) H = -5956.35 (J) S = 1.39 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.72 | 7.95 | 77.48 | 3.05 | 3.80 |

Total solids mass = 85.12 (gm) density = 2.64 (gm/cc)
G = -1326563.43 (J) H = -1146803.34 (J) S = 172.32 (J/K) V = 32.19 (cc) Cp = 99.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1566155.98 (J) H = -1345356.12 (J) S = 211.67 (J/K) V = 38.61 (cc) Cp = 119.44 (J/K)

Oxygen delta moles = -0.00119189 delta grams = -0.038139
G = 275.81 (J) H = -28.85 (J) S = -0.29 (J/K) V = -103.37 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 13.39 (gm) density = 2.30 (gm/cc) viscosity = 4.58 (log 10 poise) (analysis in wt %)
G = -216422.19 (J) H = -179254.03 (J) S = 35.98 (J/K) V = 5.83 (cc) Cp = 18.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.10 | 0.17 | 12.15 | 0.25 | 0.00 | 0.69 | 0.36 | 0.11 | 0.00 | 0.00 | 1.73 | 4.08 | 4.42 | 0.45 | 7.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.85 (gm) density = 3.98 (gm/cc) (analysis in mole %)

(Ca0.18Fe"0.63Mg0.19)3Al2Si3O12
G = -90130.68 (J) H = -77027.27 (J) S = 12.68 (J/K) V = 1.72 (cc) Cp = 7.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.35 | 17.60 | 19.04 |

orthopyroxene mass = 0.81 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.83Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -10165.09 (J) H = -8571.41 (J) S = 1.54 (J/K) V = 0.22 (cc) Cp = 0.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.03 | 97.53 | 108.58 | 4.18 | -4.07 | 5.57 | 0.24 |

feldspar mass = 39.59 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -616979.72 (J) H = -532822.55 (J) S = 81.46 (J/K) V = 15.59 (cc) Cp = 46.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.36 | 1.49 | 68.15 |

feldspar mass = 9.17 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -147502.22 (J) H = -127635.79 (J) S = 19.23 (J/K) V = 3.52 (cc) Cp = 11.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.07 | 18.98 | 8.95 |

quartz mass = 29.37 (gm) density = 2.55 (gm/cc)
SiO2
G = -475337.54 (J) H = -415491.60 (J) S = 57.93 (J/K) V = 11.50 (cc) Cp = 34.05 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.78Mg0.08Fe'"0.15Al0.07Ti0.89O3
G = -7493.80 (J) H = -6048.34 (J) S = 1.40 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.02 | 7.54 | 77.62 | 3.11 | 3.71 |

Total solids mass = 86.57 (gm) density = 2.65 (gm/cc)
G = -1347609.05 (J) H = -1167596.95 (J) S = 174.24 (J/K) V = 32.72 (cc) Cp = 100.92 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1564031.24 (J) H = -1346850.98 (J) S = 210.21 (J/K) V = 38.55 (cc) Cp = 119.27 (J/K)

Oxygen delta moles = -0.00122127 delta grams = -0.0390792
G = 279.62 (J) H = -29.14 (J) S = -0.30 (J/K) V = -104.91 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 11.93 (gm) density = 2.28 (gm/cc) viscosity = 4.21 (log 10 poise) (analysis in wt %)
G = -193237.82 (J) H = -159855.77 (J) S = 32.63 (J/K) V = 5.24 (cc) Cp = 16.48 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.23 0.14 11.96 0.24 0.00 0.66 0.40 0.11 0.00 0.00 1.76 4.45 4.13 0.50 8.40 0.00 0.00 0.00 0.00

garnet mass = 7.22 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.63Mg0.19)3Al2Si3O12
G = -94971.68 (J) H = -81372.70 (J) S = 13.29 (J/K) V = 1.81 (cc) Cp = 7.65 (J/K)
almandine grossular pyrope
62.80 17.73 19.47

orthopyroxene mass = 0.60 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.86Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -7645.71 (J) H = -6469.71 (J) S = 1.15 (J/K) V = 0.17 (cc) Cp = 0.67 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-109.12 97.55 105.97 4.04 -3.94 5.26 0.24

feldspar mass = 40.05 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -623173.09 (J) H = -539362.81 (J) S = 81.91 (J/K) V = 15.77 (cc) Cp = 47.40 (J/K)
albite anorthite sanidine
29.79 1.38 68.83

feldspar mass = 9.39 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.73Ca0.19Al1.19Si2.81O8
G = -151002.91 (J) H = -130949.06 (J) S = 19.60 (J/K) V = 3.61 (cc) Cp = 11.53 (J/K)
albite anorthite sanidine
72.66 18.68 8.66

quartz mass = 29.96 (gm) density = 2.55 (gm/cc)
SiO2
G = -484326.70 (J) H = -424211.19 (J) S = 58.76 (J/K) V = 11.73 (cc) Cp = 34.69 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.78Mg0.08Fe'"0.14Al0.07Ti0.89O3
G = -7564.78 (J) H = -6127.88 (J) S = 1.40 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.33 7.13 77.76 3.14 3.63

Total solids mass = 88.03 (gm) density = 2.65 (gm/cc)
G = -1368684.87 (J) H = -1188493.34 (J) S = 176.11 (J/K) V = 33.26 (cc) Cp = 102.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1561922.69 (J) H = -1348349.10 (J) S = 208.74 (J/K) V = 38.50 (cc) Cp = 119.14 (J/K)

Oxygen delta moles = -0.00124768 delta grams = -0.0399242
G = 282.61 (J) H = -29.33 (J) S = -0.30 (J/K) V = -106.14 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10

IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 10.24 (gm) density = 2.26 (gm/cc) viscosity = 3.72 (log 10 poise) (analysis in wt %)
G = -166155.03 (J) H = -137082.22 (J) S = 28.70 (J/K) V = 4.54 (cc) Cp = 14.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.92 | 0.11 | 11.65 | 0.26 | 0.00 | 0.68 | 0.47 | 0.10 | 0.00 | 0.00 | 1.83 | 5.01 | 3.73 | 0.59 | 9.66 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.80 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.64Mg0.19)3Al2Si3O12
G = -102161.84 (J) H = -87715.19 (J) S = 14.26 (J/K) V = 1.96 (cc) Cp = 8.24 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.56 | 17.90 | 18.54 |

biotite mass = 0.32 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -4986.74 (J) H = -4294.80 (J) S = 0.68 (J/K) V = 0.12 (cc) Cp = 0.40 (J/K)

| annite | phlogopite |
|---|---|
| 8.72 | 91.28 |

feldspar mass = 40.42 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -627841.39 (J) H = -544600.23 (J) S = 82.16 (J/K) V = 15.91 (cc) Cp = 47.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.43 | 1.26 | 69.31 |

feldspar mass = 9.56 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.73Ca0.18Al1.18Si2.82O8
G = -153512.11 (J) H = -133410.16 (J) S = 19.84 (J/K) V = 3.67 (cc) Cp = 11.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.46 | 18.09 | 8.45 |

quartz mass = 30.82 (gm) density = 2.55 (gm/cc)
SiO2
G = -497542.74 (J) H = -436671.17 (J) S = 60.08 (J/K) V = 12.07 (cc) Cp = 35.63 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.78Mg0.08Fe'"0.14Al0.07Ti0.89O3
G = -7634.32 (J) H = -6201.38 (J) S = 1.41 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.90 | 7.00 | 78.47 | 3.12 | 3.52 |

Total solids mass = 89.72 (gm) density = 2.65 (gm/cc)
G = -1393679.13 (J) H = -1212892.92 (J) S = 178.44 (J/K) V = 33.89 (cc) Cp = 104.75 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1559834.16 (J) H = -1349975.14 (J) S = 207.14 (J/K) V = 38.43 (cc) Cp = 119.04 (J/K)

Oxygen delta moles = -0.00126558 delta grams = -0.040497

G = 283.58 (J)  H = -29.31 (J)  S = -0.31 (J/K)  V = -106.61 (cc)  Cp = -0.04 (J/K)

**********_____**********
Title: akosite

T = 730.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.07  COH = 1.06
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 8.64 (gm)  density = 2.23 (gm/cc)  viscosity = 3.14 (log 10 poise)  (analysis in wt %)
G = -140703.36 (J)  H = -115597.73 (J)  S = 25.03 (J/K)  V = 3.88 (cc)  Cp = 12.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.83 | 0.09 | 11.62 | 0.27 | 0.00 | 0.68 | 0.56 | 0.09 | 0.00 | 0.00 | 1.92 | 5.53 | 3.32 | 0.70 | 11.41 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 7.76 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.64Mg0.18)3Al2Si3O12
G = -101294.92 (J)  H = -87156.32 (J)  S = 14.09 (J/K)  V = 1.94 (cc)  Cp = 8.18 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.15 | 18.02 | 17.82 |

biotite  mass = 0.40 (gm)  density = 2.80 (gm/cc)  (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -6192.53 (J)  H = -5344.35 (J)  S = 0.85 (J/K)  V = 0.14 (cc)  Cp = 0.50 (J/K)

| annite | phlogopite |
|---|---|
| 9.19 | 90.81 |

feldspar  mass = 40.59 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -629405.16 (J)  H = -547166.32 (J)  S = 81.98 (J/K)  V = 15.98 (cc)  Cp = 48.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.61 | 1.16 | 70.23 |

feldspar  mass = 10.30 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.74Ca0.18Al1.18Si2.82O8
G = -165221.86 (J)  H = -143903.80 (J)  S = 21.25 (J/K)  V = 3.95 (cc)  Cp = 12.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.81 | 18.13 | 8.06 |

quartz  mass = 31.46 (gm)  density = 2.55 (gm/cc)
SiO2
G = -507271.75 (J)  H = -446110.08 (J)  S = 60.97 (J/K)  V = 12.32 (cc)  Cp = 36.33 (J/K)

rhm-oxide  mass = 0.81 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.79Mg0.08Fe'"0.13Al0.07Ti0.90O3
G = -7670.87 (J)  H = -6250.81 (J)  S = 1.42 (J/K)  V = 0.17 (cc)  Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.56 | 6.64 | 79.23 | 3.04 | 3.52 |

Total solids  mass = 91.32 (gm)  density = 2.65 (gm/cc)
G = -1417057.10 (J)  H = -1235931.67 (J)  S = 180.56 (J/K)  V = 34.51 (cc)  Cp = 106.85 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1557760.46 (J) H = -1351529.40 (J) S = 205.58 (J/K) V = 38.39 (cc) Cp = 119.10 (J/K)

Oxygen delta moles = -0.00128492 delta grams = -0.0411158
G = 284.78 (J) H = -29.31 (J) S = -0.31 (J/K) V = -107.17 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.58 (log 10 poise)  (analysis in wt %)
G = -1694912.09 (J)  H = -1256716.26 (J)  S = 278.55 (J/K)  V = 41.48 (cc)  Cp = 140.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.31 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.58 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1694912.09 (J)  H = -1256716.26 (J)  S = 278.55 (J/K)  V = 41.48 (cc)  Cp = 140.17 (J/K)

Oxygen  delta moles = 2.25514e-16  delta grams = 7.21618e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.64 (log 10 poise)  (analysis in wt %)
G = -1692131.91 (J)  H = -1258118.63 (J)  S = 277.65 (J/K)  V = 41.45 (cc)  Cp = 140.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.31 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.64 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1692131.91 (J)  H = -1258118.63 (J)  S = 277.65 (J/K)  V = 41.45 (cc)  Cp = 140.16 (J/K)

Oxygen  delta moles = 1.54536e-06  delta grams = 4.94497e-05
G = -0.56 (J)  H = 0.07 (J)  S = 0.00 (J/K)  V = 0.20 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.71 (log 10 poise)  (analysis in wt %)
G = -1689360.80 (J)  H = -1259521.01 (J)  S = 276.75 (J/K)  V = 41.42 (cc)  Cp = 140.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1689360.80 (J)  H = -1259521.01 (J)  S = 276.75 (J/K)  V = 41.42 (cc)  Cp = 140.15 (J/K)

Oxygen  delta moles = 3.28613e-06  delta grams = 0.000105152
G = -1.18 (J)  H = 0.14 (J)  S = 0.00 (J/K)  V = 0.42 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.77 (log 10 poise)  (analysis in wt %)
G = -1686598.82 (J)  H = -1260923.40 (J)  S = 275.85 (J/K)  V = 41.39 (cc)  Cp = 140.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1686598.82 (J)  H = -1260923.40 (J)  S = 275.85 (J/K)  V = 41.39 (cc)  Cp = 140.15 (J/K)

Oxygen  delta moles = 5.22777e-06  delta grams = 0.000167283
G = -1.87 (J)  H = 0.22 (J)  S = 0.00 (J/K)  V = 0.67 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.83 (log 10 poise)  (analysis in wt %)
G = -1683846.04 (J)  H = -1262325.80 (J)  S = 274.94 (J/K)  V = 41.37 (cc)  Cp = 140.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1683846.04 (J)  H = -1262325.80 (J)  S = 274.94 (J/K)  V = 41.37 (cc)  Cp = 140.14 (J/K)

Oxygen  delta moles = 7.37598e-06  delta grams = 0.000236023
G = -2.62 (J)  H = 0.31 (J)  S = 0.00 (J/K)  V = 0.94 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.90 (log 10 poise)  (analysis in wt %)
G = -1681102.50 (J)  H = -1263728.22 (J)  S = 274.02 (J/K)  V = 41.34 (cc)  Cp = 140.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.90 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1681102.50 (J)  H = -1263728.22 (J)  S = 274.02 (J/K)  V = 41.34 (cc)  Cp = 140.13 (J/K)

Oxygen  delta moles = 9.73668e-06  delta grams = 0.000311562
G = -3.43 (J)  H = 0.40 (J)  S = 0.00 (J/K)  V = 1.23 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1240.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.24  COH = 2.19  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.96 (log 10 poise) (analysis in wt %)
G = -1678368.27 (J) H = -1265130.66 (J) S = 273.10 (J/K) V = 41.31 (cc) Cp = 140.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.96 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1678368.27 (J) H = -1265130.66 (J) S = 273.10 (J/K) V = 41.31 (cc) Cp = 140.12 (J/K)

Oxygen delta moles = 1.23161e-05 delta grams = 0.000394099
G = -4.31 (J) H = 0.51 (J) S = 0.00 (J/K) V = 1.55 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 5.03 (log 10 poise) (analysis in wt %)
G = -1675643.43 (J) H = -1266533.12 (J) S = 272.17 (J/K) V = 41.28 (cc) Cp = 140.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.03 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1675643.43 (J) H = -1266533.12 (J) S = 272.17 (J/K) V = 41.28 (cc) Cp = 140.11 (J/K)

Oxygen delta moles = 1.51205e-05 delta grams = 0.000483839
G = -5.25 (J) H = 0.62 (J) S = 0.00 (J/K) V = 1.89 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 5.10 (log 10 poise) (analysis in wt %)
G = -1672928.02 (J) H = -1267935.62 (J) S = 271.23 (J/K) V = 41.25 (cc) Cp = 140.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1672928.02 (J) H = -1267935.62 (J) S = 271.23 (J/K) V = 41.25 (cc) Cp = 140.11 (J/K)

Oxygen delta moles = 1.81569e-05 delta grams = 0.000580999
G = -6.26 (J) H = 0.73 (J) S = 0.00 (J/K) V = 2.25 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.17 (log 10 poise) (analysis in wt %)
G = -1670222.12 (J) H = -1269338.16 (J) S = 270.29 (J/K) V = 41.22 (cc) Cp = 140.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.17 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1670222.12 (J) H = -1269338.16 (J) S = 270.29 (J/K) V = 41.22 (cc) Cp = 140.10 (J/K)

Oxygen delta moles = 2.14321e-05 delta grams = 0.000685801
G = -7.33 (J) H = 0.86 (J) S = 0.01 (J/K) V = 2.64 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1200.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.12 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -1667525.67 (J) H = -1270684.95 (J) S = 269.38 (J/K) V = 41.20 (cc) Cp = 131.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.24 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1667525.67 (J) H = -1270684.95 (J) S = 269.38 (J/K) V = 41.20 (cc) Cp = 131.94 (J/K)

Oxygen delta moles = 2.49535e-05 delta grams = 0.000798481
G = -8.47 (J) H = 0.99 (J) S = 0.01 (J/K) V = 3.06 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.31 (log 10 poise) (analysis in wt %)
G = -1664838.33 (J) H = -1272005.96 (J) S = 268.48 (J/K) V = 41.17 (cc) Cp = 131.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1664838.33 (J) H = -1272005.96 (J) S = 268.48 (J/K) V = 41.17 (cc) Cp = 131.91 (J/K)

Oxygen delta moles = 2.87287e-05 delta grams = 0.000919284
G = -9.68 (J) H = 1.13 (J) S = 0.01 (J/K) V = 3.49 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1662160.14 (J) H = -1273326.82 (J) S = 267.58 (J/K) V = 41.14 (cc) Cp = 131.88 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.49 0.00 2.30 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1662160.14 (J) H = -1273326.82 (J) S = 267.58 (J/K) V = 41.14 (cc) Cp = 131.88 (J/K)

Oxygen delta moles = 3.27657e-05 delta grams = 0.00104846
G = -10.96 (J) H = 1.27 (J) S = 0.01 (J/K) V = 3.96 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.45 (log 10 poise) (analysis in wt %)
G = -1659491.16 (J) H = -1274647.52 (J) S = 266.67 (J/K) V = 41.11 (cc) Cp = 131.85 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.49 0.00 2.30 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1659491.16 (J) H = -1274647.52 (J) S = 266.67 (J/K) V = 41.11 (cc) Cp = 131.85 (J/K)

Oxygen delta moles = 3.7073e-05 delta grams = 0.00118629
G = -12.30 (J) H = 1.43 (J) S = 0.01 (J/K) V = 4.45 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1160.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.05 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -1656831.46 (J) H = -1275968.05 (J) S = 265.75 (J/K) V = 41.08 (cc) Cp = 131.82 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

73.28 0.40 12.72 0.49 0.00 2.29 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1656831.46 (J) H = -1275968.05 (J) S = 265.75 (J/K) V = 41.08 (cc) Cp = 131.82 (J/K)

Oxygen delta moles = 4.16591e-05 delta grams = 0.00133304
G = -13.72 (J) H = 1.59 (J) S = 0.01 (J/K) V = 4.96 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1150.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.03 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -1654181.11 (J) H = -1277288.41 (J) S = 264.83 (J/K) V = 41.06 (cc) Cp = 131.79 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.49 0.00 2.29 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.60 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1654181.11 (J) H = -1277288.41 (J) S = 264.83 (J/K) V = 41.06 (cc) Cp = 131.79 (J/K)

Oxygen delta moles = 4.65332e-05 delta grams = 0.00148901
G = -15.20 (J) H = 1.76 (J) S = 0.01 (J/K) V = 5.51 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1140.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.18 COH = 2.01 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1651540.18 (J) H = -1278608.58 (J) S = 263.90 (J/K) V = 41.03 (cc) Cp = 131.76 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.49 0.00 2.29 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.67 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1651540.18 (J) H = -1278608.58 (J) S = 263.90 (J/K) V = 41.03 (cc) Cp = 131.76 (J/K)

Oxygen delta moles = 5.1705e-05 delta grams = 0.0016545
G = -16.76 (J) H = 1.93 (J) S = 0.01 (J/K) V = 6.07 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1130.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.17 COH = 1.99 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -1648908.72 (J) H = -1279928.57 (J) S = 262.97 (J/K) V = 41.00 (cc) Cp = 131.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.49 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1648908.72 (J) H = -1279928.57 (J) S = 262.97 (J/K) V = 41.00 (cc) Cp = 131.72 (J/K)

Oxygen delta moles = 5.71842e-05 delta grams = 0.00182983
G = -18.39 (J) H = 2.12 (J) S = 0.01 (J/K) V = 6.67 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.83 (log 10 poise) (analysis in wt %)
G = -1646286.82 (J) H = -1281248.35 (J) S = 262.02 (J/K) V = 40.97 (cc) Cp = 131.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1646286.82 (J)  H = -1281248.35 (J)  S = 262.02 (J/K)  V = 40.97 (cc)  Cp = 131.68 (J/K)

Oxygen  delta moles = 6.29816e-05  delta grams = 0.00201533
G = -20.09 (J)  H = 2.31 (J)  S = 0.02 (J/K)  V = 7.30 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1110.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.16  COH = 1.95  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 5.90 (log 10 poise)  (analysis in wt %)
G = -1643674.53 (J)  H = -1282567.93 (J)  S = 261.08 (J/K)  V = 40.94 (cc)  Cp = 131.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.29 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.90 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1643674.53 (J)  H = -1282567.93 (J)  S = 261.08 (J/K)  V = 40.94 (cc)  Cp = 131.65 (J/K)

Oxygen  delta moles = 6.91078e-05  delta grams = 0.00221137
G = -21.87 (J)  H = 2.51 (J)  S = 0.02 (J/K)  V = 7.95 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1100.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.93  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 5.98 (log 10 poise)  (analysis in wt %)
G = -1641071.94 (J)  H = -1283887.30 (J)  S = 260.12 (J/K)  V = 40.92 (cc)  Cp = 131.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.50 | 0.00 | 2.28 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.98 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1641071.94 (J) H = -1283887.30 (J) S = 260.12 (J/K) V = 40.92 (cc) Cp = 131.61 (J/K)

Oxygen delta moles = 7.55746e-05 delta grams = 0.0024183
G = -23.73 (J) H = 2.72 (J) S = 0.02 (J/K) V = 8.63 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1090.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.91 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 99.90 (gm) density = 2.45 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -1636804.00 (J) H = -1283857.81 (J) S = 258.92 (J/K) V = 40.85 (cc) Cp = 131.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.25 | 0.40 | 12.73 | 0.50 | 0.00 | 2.28 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.39 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 0.10 (gm) density = 2.56 (gm/cc)
SiO2
G = -1675.27 (J) H = -1363.76 (J) S = 0.23 (J/K) V = 0.04 (cc) Cp = 0.12 (J/K)

Total solids mass = 0.10 (gm) density = 2.56 (gm/cc)
G = -1675.27 (J) H = -1363.76 (J) S = 0.23 (J/K) V = 0.04 (cc) Cp = 0.12 (J/K)

Viscosity of the System: 6.06 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1638479.27 (J) H = -1285221.57 (J) S = 259.15 (J/K) V = 40.88 (cc) Cp = 131.56 (J/K)

Oxygen delta moles = 8.26769e-05 delta grams = 0.00264556
G = -25.75 (J) H = 2.94 (J) S = 0.02 (J/K) V = 9.37 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1080.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.14 COH = 1.89 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 99.06 (gm) density = 2.45 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -1619994.65 (J) H = -1273693.42 (J) S = 255.92 (J/K) V = 40.46 (cc) Cp = 130.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.02 | 0.40 | 12.84 | 0.51 | 0.00 | 2.30 | 0.06 | 0.49 | 0.00 | 0.00 | 1.16 | 2.70 | 5.43 | 0.06 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 0.94 (gm) density = 2.56 (gm/cc)

SiO2
G = -15903.54 (J)  H = -12975.28 (J)  S = 2.16 (J/K)  V = 0.37 (cc)  Cp = 1.13 (J/K)

Total solids  mass = 0.94 (gm)  density = 2.56 (gm/cc)
G = -15903.54 (J)  H = -12975.28 (J)  S = 2.16 (J/K)  V = 0.37 (cc)  Cp = 1.13 (J/K)

Viscosity of the System: 6.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1635898.18 (J)  H = -1286668.70 (J)  S = 258.09 (J/K)  V = 40.83 (cc)  Cp = 131.50 (J/K)

Oxygen  delta moles = 9.23055e-05  delta grams = 0.00295367
G = -28.51 (J)  H = 3.25 (J)  S = 0.02 (J/K)  V = 10.38 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1070.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.13  COH = 1.87  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.23 (gm)  density = 2.45 (gm/cc)  viscosity = 6.17 (log 10 poise)  (analysis in wt %)
G = -1603490.44 (J)  H = -1263714.71 (J)  S = 252.97 (J/K)  V = 40.08 (cc)  Cp = 129.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.79 | 0.41 | 12.95 | 0.52 | 0.00 | 2.32 | 0.06 | 0.49 | 0.00 | 0.00 | 1.17 | 2.73 | 5.48 | 0.06 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz  mass = 1.78 (gm)  density = 2.56 (gm/cc)
SiO2
G = -29837.51 (J)  H = -24397.94 (J)  S = 4.05 (J/K)  V = 0.69 (cc)  Cp = 2.12 (J/K)

Total solids  mass = 1.78 (gm)  density = 2.56 (gm/cc)
G = -29837.51 (J)  H = -24397.94 (J)  S = 4.05 (J/K)  V = 0.69 (cc)  Cp = 2.12 (J/K)

Viscosity of the System: 6.20 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1633327.95 (J)  H = -1288112.65 (J)  S = 257.02 (J/K)  V = 40.78 (cc)  Cp = 131.44 (J/K)

Oxygen  delta moles = 0.000102334  delta grams = 0.00327455
G = -31.35 (J)  H = 3.57 (J)  S = 0.03 (J/K)  V = 11.43 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1060.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.13  COH = 1.84  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.41 (gm)  density = 2.45 (gm/cc)  viscosity = 6.22 (log 10 poise)  (analysis in wt %)
G = -1587283.44 (J)  H = -1253916.78 (J)  S = 250.06 (J/K)  V = 39.71 (cc)  Cp = 128.29 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.56 0.41 13.06 0.52 0.00 2.33 0.06 0.49 0.00 0.00 1.18 2.75 5.53 0.06 1.03 0.00 0.00 0.00 0.00

quartz mass = 2.59 (gm) density = 2.56 (gm/cc)
SiO2
G = -43485.19 (J) H = -35636.69 (J) S = 5.89 (J/K) V = 1.01 (cc) Cp = 3.09 (J/K)

Total solids mass = 2.59 (gm) density = 2.56 (gm/cc)
G = -43485.19 (J) H = -35636.69 (J) S = 5.89 (J/K) V = 1.01 (cc) Cp = 3.09 (J/K)

Viscosity of the System: 6.27 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1630768.62 (J) H = -1289553.48 (J) S = 255.95 (J/K) V = 40.72 (cc) Cp = 131.38 (J/K)

Oxygen delta moles = 0.000112776 delta grams = 0.0036087
G = -34.26 (J) H = 3.89 (J) S = 0.03 (J/K) V = 12.50 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1050.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.12 COH = 1.82 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 96.61 (gm) density = 2.46 (gm/cc) viscosity = 6.28 (log 10 poise) (analysis in wt %)
G = -1571365.95 (J) H = -1244294.90 (J) S = 247.19 (J/K) V = 39.35 (cc) Cp = 127.27 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.34 0.42 13.17 0.53 0.00 2.35 0.06 0.50 0.00 0.00 1.19 2.77 5.57 0.06 1.04 0.00 0.00 0.00 0.00

quartz mass = 3.39 (gm) density = 2.56 (gm/cc)
SiO2
G = -56854.32 (J) H = -46696.35 (J) S = 7.68 (J/K) V = 1.33 (cc) Cp = 4.04 (J/K)

Total solids mass = 3.39 (gm) density = 2.56 (gm/cc)
G = -56854.32 (J) H = -46696.35 (J) S = 7.68 (J/K) V = 1.33 (cc) Cp = 4.04 (J/K)

Viscosity of the System: 6.34 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1628220.27 (J) H = -1290991.25 (J) S = 254.87 (J/K) V = 40.67 (cc) Cp = 131.32 (J/K)

Oxygen delta moles = 0.00012365 delta grams = 0.00395664
G = -37.25 (J) H = 4.22 (J) S = 0.03 (J/K) V = 13.60 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1040.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.11 COH = 1.80 IW

= 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 95.35 (gm) density = 2.46 (gm/cc) viscosity = 6.36 (log 10 poise) (analysis in wt %)
G = -1549002.32 (J) H = -1229659.47 (J) S = 243.19 (J/K) V = 38.83 (cc) Cp = 125.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.18 | 0.42 | 13.33 | 0.52 | 0.00 | 2.28 | 0.06 | 0.43 | 0.00 | 0.00 | 1.21 | 2.81 | 5.65 | 0.06 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.40 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.88Mg1.03Fe"'0.03Ti0.00Al0.10Si1.94O6
G = -5557.28 (J) H = -4383.82 (J) S = 0.89 (J/K) V = 0.12 (cc) Cp = 0.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.14 | 97.48 | 88.22 | 3.46 | -3.35 | 5.99 | 0.34 |

quartz mass = 4.25 (gm) density = 2.56 (gm/cc)
SiO2
G = -71095.88 (J) H = -58522.81 (J) S = 9.57 (J/K) V = 1.66 (cc) Cp = 5.06 (J/K)

Total solids mass = 4.65 (gm) density = 2.62 (gm/cc)
G = -76653.17 (J) H = -62906.63 (J) S = 10.47 (J/K) V = 1.78 (cc) Cp = 5.53 (J/K)

Viscosity of the System: 6.44 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1625655.49 (J) H = -1292566.10 (J) S = 253.66 (J/K) V = 40.60 (cc) Cp = 131.13 (J/K)

Oxygen delta moles = 8.24633e-05 delta grams = 0.00263873
G = -24.63 (J) H = 2.79 (J) S = 0.02 (J/K) V = 9.00 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1030.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.10 COH = 1.78 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 94.27 (gm) density = 2.46 (gm/cc) viscosity = 6.44 (log 10 poise) (analysis in wt %)
G = -1529336.18 (J) H = -1217050.55 (J) S = 239.64 (J/K) V = 38.37 (cc) Cp = 124.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.01 | 0.43 | 13.48 | 0.52 | 0.00 | 2.23 | 0.06 | 0.39 | 0.00 | 0.00 | 1.22 | 2.84 | 5.71 | 0.06 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.68 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg0.99Fe"'0.03Ti0.00Al0.10Si1.94O6
G = -9204.24 (J) H = -7269.51 (J) S = 1.48 (J/K) V = 0.19 (cc) Cp = 0.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.56 | 97.42 | 91.33 | 3.68 | -3.56 | 6.35 | 0.35 |

quartz mass = 5.06 (gm) density = 2.56 (gm/cc)

SiO2
G = -84569.66 (J)  H = -69767.70 (J)  S = 11.36 (J/K)  V = 1.98 (cc)  Cp = 6.02 (J/K)

Total solids  mass = 5.74 (gm)  density = 2.64 (gm/cc)
G = -93773.91 (J)  H = -77037.21 (J)  S = 12.84 (J/K)  V = 2.17 (cc)  Cp = 6.80 (J/K)

Viscosity of the System: 6.54 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1623110.09 (J)  H = -1294087.76 (J)  S = 252.48 (J/K)  V = 40.54 (cc)  Cp = 130.98 (J/K)

Oxygen  delta moles = 5.55687e-05  delta grams = 0.00177813
G = -16.46 (J)  H = 1.86 (J)  S = 0.01 (J/K)  V = 6.02 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1020.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.10  COH = 1.76  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.20 (gm)  density = 2.46 (gm/cc)  viscosity = 6.51 (log 10 poise)  (analysis in wt %)
G = -1510135.93 (J)  H = -1204751.29 (J)  S = 236.16 (J/K)  V = 37.92 (cc)  Cp = 122.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.83 | 0.43 | 13.63 | 0.51 | 0.00 | 2.17 | 0.06 | 0.35 | 0.00 | 0.00 | 1.23 | 2.87 | 5.78 | 0.06 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.95 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.94Mg0.96Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -12755.24 (J)  H = -10086.58 (J)  S = 2.06 (J/K)  V = 0.27 (cc)  Cp = 1.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.98 | 97.36 | 94.42 | 3.91 | -3.79 | 6.73 | 0.36 |

quartz  mass = 5.85 (gm)  density = 2.56 (gm/cc)
SiO2
G = -97684.24 (J)  H = -80764.62 (J)  S = 13.08 (J/K)  V = 2.29 (cc)  Cp = 6.96 (J/K)

Total solids  mass = 6.80 (gm)  density = 2.66 (gm/cc)
G = -110439.48 (J)  H = -90851.20 (J)  S = 15.15 (J/K)  V = 2.56 (cc)  Cp = 8.05 (J/K)

Viscosity of the System: 6.63 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1620575.41 (J)  H = -1295602.48 (J)  S = 251.30 (J/K)  V = 40.48 (cc)  Cp = 130.84 (J/K)

Oxygen  delta moles = 2.66915e-05  delta grams = 0.000854096
G = -7.84 (J)  H = 0.88 (J)  S = 0.01 (J/K)  V = 2.87 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1010.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.09  COH = 1.73

IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 92.16 (gm) density = 2.46 (gm/cc) viscosity = 6.59 (log 10 poise) (analysis in wt %)
G = -1491378.42 (J) H = -1192744.96 (J) S = 232.73 (J/K) V = 37.48 (cc) Cp = 121.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.67 | 0.43 | 13.77 | 0.50 | 0.00 | 2.11 | 0.07 | 0.31 | 0.00 | 0.00 | 1.24 | 2.90 | 5.84 | 0.07 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.21 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.97Mg0.92Fe"'0.03Ti0.00Al0.12Si1.93O6
G = -16219.05 (J) H = -12842.05 (J) S = 2.63 (J/K) V = 0.34 (cc) Cp = 1.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.38 | 97.30 | 97.46 | 4.15 | -4.04 | 7.12 | 0.37 |

quartz mass = 6.63 (gm) density = 2.56 (gm/cc)
SiO2
G = -110454.02 (J) H = -91523.55 (J) S = 14.75 (J/K) V = 2.59 (cc) Cp = 7.87 (J/K)

Total solids mass = 7.84 (gm) density = 2.67 (gm/cc)
G = -126673.07 (J) H = -104365.60 (J) S = 17.38 (J/K) V = 2.93 (cc) Cp = 9.27 (J/K)

Viscosity of the System: 6.73 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1618051.49 (J) H = -1297110.56 (J) S = 250.12 (J/K) V = 40.42 (cc) Cp = 130.69 (J/K)

Oxygen delta moles = -4.18329e-06 delta grams = -0.00013386
G = 1.22 (J) H = -0.14 (J) S = -0.00 (J/K) V = -0.45 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 91.14 (gm) density = 2.46 (gm/cc) viscosity = 6.67 (log 10 poise) (analysis in wt %)
G = -1473043.85 (J) H = -1181017.21 (J) S = 229.37 (J/K) V = 37.06 (cc) Cp = 120.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.50 | 0.44 | 13.92 | 0.49 | 0.00 | 2.04 | 0.07 | 0.28 | 0.00 | 0.00 | 1.26 | 2.94 | 5.91 | 0.07 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.48 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.89Fe"'0.03Ti0.00Al0.12Si1.92O6
G = -19602.02 (J) H = -15541.17 (J) S = 3.19 (J/K) V = 0.42 (cc) Cp = 1.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.73 | 97.25 | 100.44 | 4.41 | -4.29 | 7.53 | 0.38 |

quartz mass = 7.38 (gm) density = 2.56 (gm/cc)

SiO2
G = -122892.52 (J)  H = -102053.81 (J)  S = 16.37 (J/K)  V = 2.89 (cc)  Cp = 8.76 (J/K)

Total solids  mass = 8.86 (gm)  density = 2.68 (gm/cc)
G = -142494.54 (J)  H = -117594.98 (J)  S = 19.56 (J/K)  V = 3.30 (cc)  Cp = 10.46 (J/K)

Viscosity of the System: 6.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1615538.38 (J)  H = -1298612.19 (J)  S = 248.93 (J/K)  V = 40.36 (cc)  Cp = 130.55 (J/K)

Oxygen  delta moles = -3.70369e-05  delta grams = -0.00118514
G = 10.69 (J)  H = -1.20 (J)  S = -0.01 (J/K)  V = -3.92 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 990.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.68  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 85.22 (gm)  density = 2.46 (gm/cc)  viscosity = 6.69 (log 10 poise)  (analysis in wt %)
G = -1375189.78 (J)  H = -1104884.24 (J)  S = 213.99 (J/K)  V = 34.66 (cc)  Cp = 112.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.35 | 0.47 | 13.95 | 0.49 | 0.00 | 2.03 | 0.07 | 0.24 | 0.00 | 0.00 | 1.27 | 2.83 | 6.05 | 0.07 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.90 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.84Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -24812.82 (J)  H = -19684.21 (J)  S = 4.06 (J/K)  V = 0.53 (cc)  Cp = 2.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.68 | 97.27 | 104.99 | 4.55 | -4.42 | 7.92 | 0.37 |

feldspar  mass = 3.86 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.33Na0.59Ca0.07Al1.07Si2.93O8
G = -63038.33 (J)  H = -51661.71 (J)  S = 9.01 (J/K)  V = 1.51 (cc)  Cp = 4.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.15 | 7.36 | 33.48 |

quartz  mass = 9.02 (gm)  density = 2.56 (gm/cc)
SiO2
G = -149979.70 (J)  H = -124820.65 (J)  S = 19.92 (J/K)  V = 3.53 (cc)  Cp = 10.70 (J/K)

Total solids  mass = 14.77 (gm)  density = 2.65 (gm/cc)
G = -237830.85 (J)  H = -196166.57 (J)  S = 32.98 (J/K)  V = 5.57 (cc)  Cp = 17.53 (J/K)

Viscosity of the System: 6.98 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1613020.63 (J)  H = -1301050.81 (J)  S = 246.98 (J/K)  V = 40.23 (cc)  Cp = 129.80 (J/K)

Oxygen  delta moles = -0.000106351  delta grams = -0.0034031

G = 30.42 (J)  H = -3.40 (J)  S = -0.03 (J/K)  V = -11.17 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 980.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.66  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 78.03 (gm)  density = 2.46 (gm/cc)  viscosity = 6.69 (log 10 poise)  (analysis in wt %)
G = -1257324.88 (J)  H = -1012133.33 (J)  S = 195.66 (J/K)  V = 31.75 (cc)  Cp = 102.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.19 | 0.51 | 13.95 | 0.49 | 0.00 | 2.03 | 0.08 | 0.21 | 0.00 | 0.00 | 1.31 | 2.72 | 6.14 | 0.08 | 1.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.33 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.79Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -30115.76 (J)  H = -23905.64 (J)  S = 4.96 (J/K)  V = 0.65 (cc)  Cp = 2.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.60 | 97.27 | 109.53 | 4.68 | -4.54 | 8.30 | 0.36 |

feldspar  mass = 8.80 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.39Na0.55Ca0.06Al1.06Si2.94O8
G = -143138.30 (J)  H = -117558.69 (J)  S = 20.41 (J/K)  V = 3.45 (cc)  Cp = 10.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 54.94 | 6.33 | 38.72 |

quartz  mass = 10.84 (gm)  density = 2.56 (gm/cc)
SiO2
G = -179939.70 (J)  H = -150082.07 (J)  S = 23.83 (J/K)  V = 4.24 (cc)  Cp = 12.84 (J/K)

Total solids  mass = 21.96 (gm)  density = 2.63 (gm/cc)
G = -353193.76 (J)  H = -291546.39 (J)  S = 49.19 (J/K)  V = 8.34 (cc)  Cp = 26.10 (J/K)

Viscosity of the System: 7.16 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.49 (gm/cc)
G = -1610518.64 (J)  H = -1303679.72 (J)  S = 244.85 (J/K)  V = 40.09 (cc)  Cp = 128.91 (J/K)

Oxygen  delta moles = -0.000185998  delta grams = -0.0059517
G = 52.74 (J)  H = -5.89 (J)  S = -0.05 (J/K)  V = -19.38 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 970.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.06  COH = 1.64  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 71.46 (gm)  density = 2.46 (gm/cc)  viscosity = 6.68 (log 10 poise)  (analysis in wt %)
G = -1150049.62 (J)  H = -927533.91 (J)  S = 178.99 (J/K)  V = 29.09 (cc)  Cp = 94.18 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.03 0.56 13.96 0.50 0.00 2.02 0.08 0.19 0.00 0.00 1.36 2.62 6.18 0.08 1.40 0.00 0.00 0.00 0.00

orthopyroxene mass = 2.74 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.75Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -34920.91 (J) H = -27744.05 (J) S = 5.77 (J/K) V = 0.76 (cc) Cp = 3.07 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-119.96 97.25 113.55 4.81 -4.65 8.66 0.35

feldspar mass = 13.31 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.42Na0.52Ca0.06Al1.06Si2.94O8
G = -216030.47 (J) H = -177827.58 (J) S = 30.73 (J/K) V = 5.23 (cc) Cp = 16.05 (J/K)
albite anorthite sanidine
52.39 5.93 41.67

quartz mass = 12.48 (gm) density = 2.56 (gm/cc)
SiO2
G = -207037.67 (J) H = -173060.01 (J) S = 27.33 (J/K) V = 4.88 (cc) Cp = 14.79 (J/K)

Total solids mass = 28.53 (gm) density = 2.63 (gm/cc)
G = -457989.05 (J) H = -378631.63 (J) S = 63.84 (J/K) V = 10.87 (cc) Cp = 33.90 (J/K)

Viscosity of the System: 7.36 (log 10 poise)

System mass = 99.99 (gm) density = 2.50 (gm/cc)
G = -1608038.66 (J) H = -1306165.54 (J) S = 242.83 (J/K) V = 39.96 (cc) Cp = 128.08 (J/K)

Oxygen delta moles = -0.000263433 delta grams = -0.00842953
G = 74.04 (J) H = -8.24 (J) S = -0.07 (J/K) V = -27.23 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 960.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.05 COH = 1.61 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 65.60 (gm) density = 2.45 (gm/cc) viscosity = 6.67 (log 10 poise) (analysis in wt %)
G = -1054767.51 (J) H = -852292.52 (J) S = 164.19 (J/K) V = 26.72 (cc) Cp = 86.51 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.88 0.61 13.98 0.49 0.00 2.00 0.09 0.17 0.00 0.00 1.41 2.54 6.20 0.09 1.53 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.11 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.17Mg0.71Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -39257.75 (J) H = -31224.64 (J) S = 6.51 (J/K) V = 0.86 (cc) Cp = 3.46 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-123.78 97.22 117.08 4.94 -4.76 8.97 0.34

feldspar mass = 17.33 (gm) density = 2.55 (gm/cc) (analysis in mole %)

K0.44Na0.51Ca0.06Al1.06Si2.94O8
G = -280453.87 (J) H = -231390.84 (J) S = 39.79 (J/K) V = 6.80 (cc) Cp = 20.85 (J/K)
albite anorthite sanidine
50.65 5.78 43.56

quartz mass = 13.95 (gm) density = 2.56 (gm/cc)
SiO2
G = -231101.16 (J) H = -193594.34 (J) S = 30.42 (J/K) V = 5.46 (cc) Cp = 16.51 (J/K)

Total solids mass = 34.39 (gm) density = 2.62 (gm/cc)
G = -550812.77 (J) H = -456209.82 (J) S = 76.72 (J/K) V = 13.12 (cc) Cp = 40.82 (J/K)

Viscosity of the System: 7.60 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1605580.28 (J) H = -1308502.34 (J) S = 240.91 (J/K) V = 39.84 (cc) Cp = 127.33 (J/K)

Oxygen delta moles = -0.000337479 delta grams = -0.0107989
G = 94.00 (J) H = -10.44 (J) S = -0.08 (J/K) V = -34.60 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 950.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.04 COH = 1.58 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 60.41 (gm) density = 2.45 (gm/cc) viscosity = 6.65 (log 10 poise) (analysis in wt %)
G = -970409.58 (J) H = -785602.83 (J) S = 151.09 (J/K) V = 24.63 (cc) Cp = 79.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.73 | 0.66 | 14.00 | 0.49 | 0.00 | 1.96 | 0.10 | 0.15 | 0.00 | 0.00 | 1.46 | 2.47 | 6.21 | 0.10 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.45 (gm) density = 3.64 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.20Mg0.67Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -43163.61 (J) H = -34377.96 (J) S = 7.18 (J/K) V = 0.95 (cc) Cp = 3.82 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-127.10 97.18 120.15 5.06 -4.86 9.24 0.33

feldspar mass = 20.87 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.45Na0.49Ca0.06Al1.06Si2.94O8
G = -337128.22 (J) H = -278795.17 (J) S = 47.69 (J/K) V = 8.20 (cc) Cp = 25.08 (J/K)
albite anorthite sanidine
49.36 5.74 44.89

quartz mass = 15.26 (gm) density = 2.56 (gm/cc)
SiO2
G = -252441.31 (J) H = -211929.66 (J) S = 33.12 (J/K) V = 5.97 (cc) Cp = 18.04 (J/K)

Total solids mass = 39.58 (gm) density = 2.62 (gm/cc)
G = -632733.14 (J) H = -525102.80 (J) S = 87.99 (J/K) V = 15.11 (cc) Cp = 46.95 (J/K)

Viscosity of the System: 7.89 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1603142.72 (J) H = -1310705.62 (J) S = 239.09 (J/K) V = 39.74 (cc) Cp = 126.65 (J/K)

Oxygen delta moles = -0.000407688 delta grams = -0.0130455
G = 112.53 (J) H = -12.46 (J) S = -0.10 (J/K) V = -41.46 (cc) Cp = -0.01 (J/K)

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Title: akosite

T = 940.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.03 COH = 1.56 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 55.79 (gm) density = 2.45 (gm/cc) viscosity = 6.63 (log 10 poise) (analysis in wt %)
G = -895562.69 (J) H = -726368.03 (J) S = 139.47 (J/K) V = 22.76 (cc) Cp = 73.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.58 | 0.72 | 14.02 | 0.48 | 0.00 | 1.91 | 0.11 | 0.14 | 0.00 | 0.00 | 1.51 | 2.41 | 6.21 | 0.11 | 1.80 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.76 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.23Mg0.64Fe'"0.05Ti0.00Al0.15Si1.90O6
G = -46671.65 (J) H = -37230.49 (J) S = 7.78 (J/K) V = 1.03 (cc) Cp = 4.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -129.95 | 97.14 | 122.80 | 5.17 | -4.95 | 9.46 | 0.33 |

feldspar mass = 24.01 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.46Na0.48Ca0.06Al1.06Si2.94O8
G = -387064.23 (J) H = -320833.34 (J) S = 54.59 (J/K) V = 9.43 (cc) Cp = 28.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.34 | 5.76 | 45.90 |

quartz mass = 16.43 (gm) density = 2.56 (gm/cc)
SiO2
G = -271426.63 (J) H = -228361.11 (J) S = 35.50 (J/K) V = 6.43 (cc) Cp = 19.41 (J/K)

Total solids mass = 44.20 (gm) density = 2.62 (gm/cc)
G = -705162.52 (J) H = -586424.94 (J) S = 97.88 (J/K) V = 16.88 (cc) Cp = 52.37 (J/K)

Viscosity of the System: 8.29 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1600725.21 (J) H = -1312792.97 (J) S = 237.34 (J/K) V = 39.64 (cc) Cp = 126.03 (J/K)

Oxygen delta moles = -0.000473848 delta grams = -0.0151626
G = 129.61 (J) H = -14.32 (J) S = -0.12 (J/K) V = -47.79 (cc) Cp = -0.02 (J/K)

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Title: akosite

T = 930.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.02 COH = 1.53 IW

= 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 51.65 (gm) density = 2.45 (gm/cc) viscosity = 6.61 (log 10 poise) (analysis in wt %)
G = -828697.73 (J) H = -673383.11 (J) S = 129.09 (J/K) V = 21.10 (cc) Cp = 68.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.44 | 0.77 | 14.03 | 0.47 | 0.00 | 1.86 | 0.12 | 0.12 | 0.00 | 0.00 | 1.55 | 2.36 | 6.21 | 0.12 | 1.94 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.04 (gm) density = 3.66 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.25Mg0.62Fe"'0.05Ti0.00Al0.15Si1.90O6
G = -49820.25 (J) H = -39811.88 (J) S = 8.32 (J/K) V = 1.10 (cc) Cp = 4.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -132.42 | 97.11 | 125.12 | 5.28 | -5.04 | 9.63 | 0.32 |

feldspar mass = 25.77 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.48Na0.47Ca0.06Al1.06Si2.94O8
G = -414578.47 (J) H = -344428.87 (J) S = 58.30 (J/K) V = 10.12 (cc) Cp = 30.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 46.82 | 5.55 | 47.64 |

feldspar mass = 1.02 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.22Na0.64Ca0.14Al1.14Si2.86O8
G = -16690.29 (J) H = -13884.68 (J) S = 2.33 (J/K) V = 0.40 (cc) Cp = 1.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.89 | 14.39 | 21.71 |

quartz mass = 17.49 (gm) density = 2.56 (gm/cc)
SiO2
G = -288540.17 (J) H = -243283.07 (J) S = 37.62 (J/K) V = 6.84 (cc) Cp = 20.64 (J/K)

Total solids mass = 48.33 (gm) density = 2.62 (gm/cc)
G = -769629.17 (J) H = -641408.50 (J) S = 106.57 (J/K) V = 18.46 (cc) Cp = 57.21 (J/K)

Viscosity of the System: 8.97 (log 10 poise)

System mass = 99.98 (gm) density = 2.53 (gm/cc)
G = -1598326.90 (J) H = -1314791.60 (J) S = 235.66 (J/K) V = 39.56 (cc) Cp = 125.46 (J/K)

Oxygen delta moles = -0.000536124 delta grams = -0.0171553
G = 145.30 (J) H = -16.01 (J) S = -0.13 (J/K) V = -53.63 (cc) Cp = -0.02 (J/K)

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Title: akosite

T = 920.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.02 COH = 1.50 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 47.91 (gm) density = 2.45 (gm/cc) viscosity = 6.59 (log 10 poise) (analysis in wt %)
G = -768273.21 (J) H = -625421.51 (J) S = 119.73 (J/K) V = 19.59 (cc) Cp = 63.35 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.31 0.83 14.04 0.46 0.00 1.79 0.13 0.11 0.00 0.00 1.57 2.32 6.22 0.13 2.09 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.30 (gm) density = 3.67 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.27Mg0.60Fe'"0.05Ti0.00Al0.15Si1.90O6
G = -52639.88 (J) H = -42145.05 (J) S = 8.80 (J/K) V = 1.17 (cc) Cp = 4.70 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-134.61 97.12 127.16 5.36 -5.10 9.75 0.32

feldspar mass = 26.13 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.51Na0.44Ca0.05Al1.05Si2.95O8
G = -419108.23 (J) H = -348983.96 (J) S = 58.77 (J/K) V = 10.27 (cc) Cp = 31.25 (J/K)
albite anorthite sanidine
44.46 4.99 50.55

feldspar mass = 3.17 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.20Na0.65Ca0.16Al1.16Si2.84O8
G = -51688.62 (J) H = -43107.84 (J) S = 7.19 (J/K) V = 1.23 (cc) Cp = 3.84 (J/K)
albite anorthite sanidine
64.68 15.66 19.66

quartz mass = 18.47 (gm) density = 2.56 (gm/cc)
SiO2
G = -304237.28 (J) H = -257070.05 (J) S = 39.53 (J/K) V = 7.22 (cc) Cp = 21.78 (J/K)

Total solids mass = 52.07 (gm) density = 2.62 (gm/cc)
G = -827674.01 (J) H = -691306.90 (J) S = 114.29 (J/K) V = 19.89 (cc) Cp = 61.57 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.98 (gm) density = 2.53 (gm/cc)
G = -1595947.22 (J) H = -1316728.41 (J) S = 234.02 (J/K) V = 39.48 (cc) Cp = 124.93 (J/K)

Oxygen delta moles = -0.00059478 delta grams = -0.0190322
G = 159.71 (J) H = -17.55 (J) S = -0.15 (J/K) V = -59.00 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 910.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.01 COH = 1.48 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 43.98 (gm) density = 2.44 (gm/cc) viscosity = 6.55 (log 10 poise) (analysis in wt %)
G = -705337.17 (J) H = -575207.18 (J) S = 109.99 (J/K) V = 18.02 (cc) Cp = 58.21 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.29 0.75 14.07 0.44 0.00 1.70 0.13 0.11 0.00 0.00 1.60 2.29 6.21 0.14 2.28 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.43 (gm) density = 3.68 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.28Mg0.59Fe'"0.05Ti0.00Al0.16Si1.90O6
G = -54013.98 (J) H = -43350.50 (J) S = 9.01 (J/K) V = 1.20 (cc) Cp = 4.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -135.55 | 97.10 | 128.11 | 5.44 | -5.19 | 9.78 | 0.31 |

feldspar mass = 27.08 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.53Na0.42Ca0.05Al1.05Si2.95O8
G = -433066.39 (J) H = -361432.74 (J) S = 60.54 (J/K) V = 10.65 (cc) Cp = 32.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 42.18 | 4.53 | 53.30 |

feldspar mass = 4.81 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.18Na0.65Ca0.17Al1.17Si2.83O8
G = -78455.71 (J) H = -65595.43 (J) S = 10.87 (J/K) V = 1.86 (cc) Cp = 5.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.16 | 16.99 | 17.85 |

quartz mass = 19.53 (gm) density = 2.56 (gm/cc)
SiO2
G = -321259.06 (J) H = -272035.36 (J) S = 41.60 (J/K) V = 7.64 (cc) Cp = 23.00 (J/K)

rhm-oxide mass = 0.15 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.74Mg0.06Fe'"0.25Al0.11Ti0.82O3
G = -1475.81 (J) H = -1128.63 (J) S = 0.29 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 5.97 | 12.44 | 74.19 | 1.89 | 5.50 |

Total solids mass = 56.00 (gm) density = 2.62 (gm/cc)
G = -888270.95 (J) H = -743542.66 (J) S = 122.32 (J/K) V = 21.38 (cc) Cp = 66.14 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1593608.12 (J) H = -1318749.83 (J) S = 232.31 (J/K) V = 39.40 (cc) Cp = 124.35 (J/K)

Oxygen delta moles = -0.000608995 delta grams = -0.0194871
G = 162.01 (J) H = -17.75 (J) S = -0.15 (J/K) V = -59.91 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 40.55 (gm) density = 2.44 (gm/cc) viscosity = 6.51 (log 10 poise) (analysis in wt %)
G = -650333.88 (J) H = -531266.58 (J) S = 101.49 (J/K) V = 16.65 (cc) Cp = 53.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.23 | 0.70 | 14.08 | 0.42 | 0.00 | 1.62 | 0.14 | 0.10 | 0.00 | 0.00 | 1.61 | 2.28 | 6.19 | 0.15 | 2.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.56 (gm) density = 3.68 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.29Mg0.58Fe'"0.05Ti0.00Al0.16Si1.90O6
G = -55388.67 (J) H = -44561.67 (J) S = 9.23 (J/K) V = 1.24 (cc) Cp = 4.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -136.54 | 97.11 | 129.08 | 5.52 | -5.28 | 9.81 | 0.30 |

feldspar mass = 28.04 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.56Na0.40Ca0.04Al1.04Si2.96O8
G = -447272.53 (J) H = -374146.27 (J) S = 62.33 (J/K) V = 11.03 (cc) Cp = 33.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.29 | 4.16 | 55.55 |

feldspar mass = 6.12 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.65Ca0.18Al1.18Si2.82O8
G = -99655.00 (J) H = -83524.66 (J) S = 13.75 (J/K) V = 2.36 (cc) Cp = 7.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.49 | 18.08 | 16.44 |

quartz mass = 20.46 (gm) density = 2.56 (gm/cc)
SiO2
G = -336145.68 (J) H = -285250.15 (J) S = 43.38 (J/K) V = 8.00 (cc) Cp = 24.08 (J/K)

rhm-oxide mass = 0.26 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.75Mg0.06Fe'"0.24Al0.11Ti0.82O3
G = -2485.07 (J) H = -1906.88 (J) S = 0.49 (J/K) V = 0.06 (cc) Cp = 0.25 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 5.83 | 12.23 | 74.52 | 1.97 | 5.44 |

Total solids mass = 59.43 (gm) density = 2.62 (gm/cc)
G = -940946.96 (J) H = -789389.63 (J) S = 129.19 (J/K) V = 22.68 (cc) Cp = 70.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1591280.84 (J) H = -1320656.21 (J) S = 230.68 (J/K) V = 39.33 (cc) Cp = 123.83 (J/K)

Oxygen delta moles = -0.000632095 delta grams = -0.0202263
G = 166.58 (J) H = -18.20 (J) S = -0.16 (J/K) V = -61.65 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 890.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.01 COH = 1.42 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 37.45 (gm) density = 2.43 (gm/cc) viscosity = 6.46 (log 10 poise) (analysis in wt %)
G = -600742.19 (J) H = -491574.81 (J) S = 93.85 (J/K) V = 15.41 (cc) Cp = 49.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.17 | 0.65 | 14.10 | 0.41 | 0.00 | 1.54 | 0.15 | 0.09 | 0.00 | 0.00 | 1.62 | 2.27 | 6.16 | 0.16 | 2.68 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.67 (gm) density = 3.69 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.30Mg0.57Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -56582.84 (J) H = -45635.40 (J) S = 9.41 (J/K) V = 1.27 (cc) Cp = 5.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -137.42 | 97.13 | 129.93 | 5.61 | -5.38 | 9.84 | 0.30 |

feldspar mass = 28.97 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.58Na0.39Ca0.04Al1.04Si2.96O8
G = -460988.24 (J) H = -386505.53 (J) S = 64.04 (J/K) V = 11.40 (cc) Cp = 34.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.65 | 3.84 | 57.50 |

feldspar mass = 7.23 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.15Na0.66Ca0.19Al1.19Si2.81O8
G = -117658.63 (J) H = -98853.42 (J) S = 16.17 (J/K) V = 2.78 (cc) Cp = 8.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.73 | 19.01 | 15.26 |

quartz mass = 21.31 (gm) density = 2.56 (gm/cc)
SiO2
G = -349654.80 (J) H = -297347.05 (J) S = 44.97 (J/K) V = 8.33 (cc) Cp = 25.05 (J/K)

rhm-oxide mass = 0.35 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.75Mg0.06Fe'"0.24Al0.11Ti0.83O3
G = -3342.53 (J) H = -2573.53 (J) S = 0.66 (J/K) V = 0.07 (cc) Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 5.71 | 12.00 | 74.86 | 2.06 | 5.38 |

Total solids mass = 62.53 (gm) density = 2.62 (gm/cc)
G = -988227.04 (J) H = -830914.94 (J) S = 135.25 (J/K) V = 23.85 (cc) Cp = 73.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1588969.23 (J) H = -1322489.75 (J) S = 229.10 (J/K) V = 39.27 (cc) Cp = 123.36 (J/K)

Oxygen delta moles = -0.000655968 delta grams = -0.0209902
G = 171.24 (J) H = -18.65 (J) S = -0.16 (J/K) V = -63.44 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 880.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.02 COH = 1.39 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 34.19 (gm) density = 2.42 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -548639.61 (J) H = -449516.95 (J) S = 85.96 (J/K) V = 14.12 (cc) Cp = 45.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.30 | 0.61 | 13.82 | 0.38 | 0.00 | 1.41 | 0.16 | 0.10 | 0.00 | 0.00 | 1.63 | 2.43 | 6.04 | 0.18 | 2.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.82 (gm) density = 4.00 (gm/cc) (analysis in mole %)

(Ca0.16Fe"0.67Mg0.17)3Al2Si3O12
G = -24015.13 (J) H = -19897.93 (J) S = 3.57 (J/K) V = 0.46 (cc) Cp = 1.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 67.22 | 15.63 | 17.16 |

orthopyroxene mass = 3.55 (gm) density = 3.67 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.27Mg0.61Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -43352.05 (J) H = -35117.01 (J) S = 7.14 (J/K) V = 0.97 (cc) Cp = 3.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -133.31 | 97.07 | 126.63 | 5.39 | -5.17 | 9.10 | 0.30 |

feldspar mass = 31.40 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.58Na0.38Ca0.04Al1.04Si2.96O8
G = -498856.22 (J) H = -419204.16 (J) S = 69.07 (J/K) V = 12.35 (cc) Cp = 37.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.34 | 3.59 | 58.07 |

feldspar mass = 6.14 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.15Na0.66Ca0.19Al1.19Si2.81O8
G = -99846.20 (J) H = -84075.56 (J) S = 13.68 (J/K) V = 2.36 (cc) Cp = 7.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.46 | 18.65 | 14.90 |

quartz mass = 22.44 (gm) density = 2.56 (gm/cc)
SiO2
G = -367819.07 (J) H = -313459.60 (J) S = 47.14 (J/K) V = 8.78 (cc) Cp = 26.36 (J/K)

rhm-oxide mass = 0.43 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.75Mg0.06Fe'"0.23Al0.10Ti0.84O3
G = -4096.40 (J) H = -3167.70 (J) S = 0.81 (J/K) V = 0.09 (cc) Cp = 0.40 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.13 | 11.27 | 75.21 | 2.23 | 5.17 |

Total solids mass = 65.79 (gm) density = 2.63 (gm/cc)
G = -1037985.07 (J) H = -874921.96 (J) S = 141.41 (J/K) V = 25.01 (cc) Cp = 77.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1586624.68 (J) H = -1324438.90 (J) S = 227.36 (J/K) V = 39.13 (cc) Cp = 122.76 (J/K)

Oxygen delta moles = -0.000773941 delta grams = -0.0247652
G = 200.11 (J) H = -21.74 (J) S = -0.19 (J/K) V = -74.20 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36
IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 31.39 (gm) density = 2.41 (gm/cc) viscosity = 6.25 (log 10 poise) (analysis in wt %)
G = -503920.85 (J) H = -413412.43 (J) S = 79.17 (J/K) V = 13.01 (cc) Cp = 41.74 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.36 0.56 13.60 0.36 0.00 1.30 0.17 0.10 0.00 0.00 1.64 2.57 5.94 0.19 3.19 0.00 0.00 0.00 0.00

garnet mass = 3.02 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.66Mg0.18)3Al2Si3O12
G = -39835.49 (J) H = -33099.36 (J) S = 5.89 (J/K) V = 0.76 (cc) Cp = 3.23 (J/K)
almandine grossular pyrope
66.46 15.95 17.58

orthopyroxene mass = 2.85 (gm) density = 3.66 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.24Mg0.64Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -34930.22 (J) H = -28407.69 (J) S = 5.71 (J/K) V = 0.78 (cc) Cp = 3.12 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-130.12 97.03 124.03 5.23 -5.03 8.55 0.31

feldspar mass = 33.12 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.59Na0.38Ca0.03Al1.03Si2.97O8
G = -525201.89 (J) H = -442345.49 (J) S = 72.48 (J/K) V = 13.03 (cc) Cp = 39.35 (J/K)
albite anorthite sanidine
37.78 3.34 58.88

feldspar mass = 5.72 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.67Ca0.19Al1.19Si2.81O8
G = -92892.90 (J) H = -78397.46 (J) S = 12.68 (J/K) V = 2.20 (cc) Cp = 6.92 (J/K)
albite anorthite sanidine
67.08 18.51 14.41

quartz mass = 23.39 (gm) density = 2.56 (gm/cc)
SiO2
G = -382821.19 (J) H = -326936.83 (J) S = 48.89 (J/K) V = 9.15 (cc) Cp = 27.45 (J/K)

rhm-oxide mass = 0.49 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.75Mg0.06Fe'"0.21Al0.10Ti0.84O3
G = -4713.63 (J) H = -3659.94 (J) S = 0.92 (J/K) V = 0.11 (cc) Cp = 0.46 (J/K)
geikielite hematite ilmenite pyrophanite corundum
6.44 10.68 75.50 2.38 5.00

Total solids mass = 68.59 (gm) density = 2.64 (gm/cc)
G = -1080395.32 (J) H = -912846.76 (J) S = 146.57 (J/K) V = 26.02 (cc) Cp = 80.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1584316.17 (J) H = -1326259.19 (J) S = 225.74 (J/K) V = 39.03 (cc) Cp = 122.26 (J/K)

Oxygen delta moles = -0.000855196 delta grams = -0.0273652
G = 218.99 (J) H = -23.71 (J) S = -0.21 (J/K) V = -81.28 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33

IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 28.88 (gm) density = 2.40 (gm/cc) viscosity = 6.13 (log 10 poise) (analysis in wt %)
G = -463868.22 (J) H = -381022.72 (J) S = 73.11 (J/K) V = 12.01 (cc) Cp = 38.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.39 | 0.52 | 13.40 | 0.34 | 0.00 | 1.20 | 0.19 | 0.11 | 0.00 | 0.00 | 1.64 | 2.71 | 5.83 | 0.21 | 3.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.02 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.66Mg0.18)3Al2Si3O12
G = -53147.63 (J) H = -44284.17 (J) S = 7.82 (J/K) V = 1.01 (cc) Cp = 4.30 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.73 | 16.26 | 18.01 |

orthopyroxene mass = 2.26 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.21Mg0.67Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -27923.55 (J) H = -22799.20 (J) S = 4.52 (J/K) V = 0.62 (cc) Cp = 2.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -126.91 | 97.00 | 121.37 | 5.08 | -4.88 | 8.04 | 0.31 |

feldspar mass = 34.55 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.60Na0.37Ca0.03Al1.03Si2.97O8
G = -546835.76 (J) H = -461610.74 (J) S = 75.21 (J/K) V = 13.59 (cc) Cp = 41.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.22 | 3.10 | 59.67 |

feldspar mass = 5.47 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.68Ca0.18Al1.18Si2.82O8
G = -88749.21 (J) H = -75069.23 (J) S = 12.07 (J/K) V = 2.11 (cc) Cp = 6.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.71 | 18.35 | 13.94 |

quartz mass = 24.24 (gm) density = 2.56 (gm/cc)
SiO2
G = -396278.24 (J) H = -339145.42 (J) S = 50.42 (J/K) V = 9.48 (cc) Cp = 28.42 (J/K)

rhm-oxide mass = 0.55 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.07Fe'"0.20Al0.10Ti0.85O3
G = -5227.86 (J) H = -4075.60 (J) S = 1.02 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.76 | 10.12 | 75.74 | 2.53 | 4.85 |

Total solids mass = 71.09 (gm) density = 2.64 (gm/cc)
G = -1118162.25 (J) H = -946984.35 (J) S = 151.06 (J/K) V = 26.92 (cc) Cp = 83.34 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1582030.48 (J) H = -1328007.07 (J) S = 224.17 (J/K) V = 38.93 (cc) Cp = 121.80 (J/K)

Oxygen delta moles = -0.000923536 delta grams = -0.029552

G = 234.20 (J)  H = -25.28 (J)  S = -0.23 (J/K)  V = -87.01 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 850.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.84  delta HM = -5.08  NNO = 0.00  QFM = -0.05  COH = 1.30
IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid  mass = 26.61 (gm)  density = 2.40 (gm/cc)  viscosity = 6.01 (log 10 poise)  (analysis in wt %)
G = -427655.71 (J)  H = -351684.97 (J)  S = 67.64 (J/K)  V = 11.10 (cc)  Cp = 35.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.38 | 0.48 | 13.21 | 0.32 | 0.00 | 1.10 | 0.20 | 0.11 | 0.00 | 0.00 | 1.65 | 2.86 | 5.71 | 0.23 | 3.77 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 4.87 (gm)  density = 3.98 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.65Mg0.18)3Al2Si3O12
G = -64410.27 (J)  H = -53817.47 (J)  S = 9.43 (J/K)  V = 1.22 (cc)  Cp = 5.21 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.01 | 16.54 | 18.44 |

orthopyroxene  mass = 1.78 (gm)  density = 3.64 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.19Mg0.70Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -22058.67 (J)  H = -18081.12 (J)  S = 3.54 (J/K)  V = 0.49 (cc)  Cp = 1.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -123.71 | 96.98 | 118.68 | 4.93 | -4.74 | 7.56 | 0.31 |

feldspar  mass = 35.74 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.60Na0.37Ca0.03Al1.03Si2.97O8
G = -564680.28 (J)  H = -477753.37 (J)  S = 77.40 (J/K)  V = 14.06 (cc)  Cp = 42.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.65 | 2.88 | 60.47 |

feldspar  mass = 5.36 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.13Na0.68Ca0.18Al1.18Si2.82O8
G = -86833.58 (J)  H = -73613.93 (J)  S = 11.77 (J/K)  V = 2.06 (cc)  Cp = 6.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.34 | 18.18 | 13.48 |

quartz  mass = 25.02 (gm)  density = 2.56 (gm/cc)
SiO2
G = -408468.75 (J)  H = -350315.77 (J)  S = 51.78 (J/K)  V = 9.78 (cc)  Cp = 29.30 (J/K)

rhm-oxide  mass = 0.59 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.76Mg0.07Fe'"0.19Al0.09Ti0.86O3
G = -5658.52 (J)  H = -4428.90 (J)  S = 1.09 (J/K)  V = 0.13 (cc)  Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.09 | 9.59 | 75.94 | 2.67 | 4.71 |

Total solids  mass = 73.35 (gm)  density = 2.64 (gm/cc)
G = -1152110.07 (J)  H = -978010.56 (J)  S = 155.01 (J/K)  V = 27.74 (cc)  Cp = 85.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1579765.78 (J) H = -1329695.52 (J) S = 222.65 (J/K) V = 38.85 (cc) Cp = 121.39 (J/K)

Oxygen delta moles = -0.000981465 delta grams = -0.0314057
G = 246.46 (J) H = -26.52 (J) S = -0.24 (J/K) V = -91.65 (cc) Cp = -0.03 (J/K)

**********_____**********
Title: akosite

T = 840.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.06 COH = 1.27 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 24.55 (gm) density = 2.39 (gm/cc) viscosity = 5.88 (log 10 poise) (analysis in wt %)
G = -394624.68 (J) H = -324870.13 (J) S = 62.66 (J/K) V = 10.28 (cc) Cp = 32.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.32 | 0.44 | 13.02 | 0.30 | 0.00 | 1.01 | 0.21 | 0.11 | 0.00 | 0.00 | 1.65 | 3.02 | 5.58 | 0.25 | 4.08 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.59 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.64Mg0.19)3Al2Si3O12
G = -73991.94 (J) H = -61993.27 (J) S = 10.78 (J/K) V = 1.40 (cc) Cp = 5.98 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.32 | 16.81 | 18.87 |

orthopyroxene mass = 1.37 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.16Mg0.73Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -17118.36 (J) H = -14085.87 (J) S = 2.72 (J/K) V = 0.38 (cc) Cp = 1.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -120.54 | 96.96 | 115.98 | 4.78 | -4.60 | 7.11 | 0.31 |

feldspar mass = 36.74 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.03Al1.03Si2.97O8
G = -579457.92 (J) H = -491364.26 (J) S = 79.14 (J/K) V = 14.46 (cc) Cp = 43.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.07 | 2.67 | 61.25 |

feldspar mass = 5.35 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.69Ca0.18Al1.18Si2.82O8
G = -86688.56 (J) H = -73655.62 (J) S = 11.71 (J/K) V = 2.06 (cc) Cp = 6.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.96 | 18.00 | 13.04 |

quartz mass = 25.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -419618.48 (J) H = -360634.98 (J) S = 52.99 (J/K) V = 10.06 (cc) Cp = 30.11 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.07Fe'"0.18Al0.09Ti0.86O3
G = -6020.70 (J) H = -4730.86 (J) S = 1.16 (J/K) V = 0.13 (cc) Cp = 0.58 (J/K)

geikielite hematite ilmenite pyrophanite corundum
7.41 9.09 76.11 2.80 4.58

Total solids mass = 75.42 (gm) density = 2.65 (gm/cc)
G = -1182895.96 (J) H = -1006464.85 (J) S = 158.50 (J/K) V = 28.50 (cc) Cp = 88.20 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1577520.63 (J) H = -1331334.99 (J) S = 221.16 (J/K) V = 38.77 (cc) Cp = 121.01 (J/K)

Oxygen delta moles = -0.00103095 delta grams = -0.0329892
G = 256.33 (J) H = -27.49 (J) S = -0.25 (J/K) V = -95.42 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 22.65 (gm) density = 2.38 (gm/cc) viscosity = 5.73 (log 10 poise) (analysis in wt %)
G = -364239.67 (J) H = -300147.44 (J) S = 58.10 (J/K) V = 9.52 (cc) Cp = 30.33 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.23 0.40 12.84 0.28 0.00 0.93 0.22 0.12 0.00 0.00 1.65 3.18 5.45 0.27 4.43 0.00 0.00 0.00 0.00

garnet mass = 6.20 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.64Mg0.19)3Al2Si3O12
G = -82190.99 (J) H = -69050.17 (J) S = 11.91 (J/K) V = 1.56 (cc) Cp = 6.63 (J/K)
almandine grossular pyrope
63.65 17.05 19.30

orthopyroxene mass = 1.03 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.13Mg0.77Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -12928.78 (J) H = -10678.98 (J) S = 2.04 (J/K) V = 0.29 (cc) Cp = 1.14 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-117.41 96.94 113.30 4.62 -4.46 6.68 0.32

feldspar mass = 37.59 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.62Na0.35Ca0.02Al1.02Si2.98O8
G = -591741.80 (J) H = -502912.89 (J) S = 80.52 (J/K) V = 14.79 (cc) Cp = 44.51 (J/K)
albite anorthite sanidine
35.49 2.48 62.04

feldspar mass = 5.44 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.70Ca0.18Al1.18Si2.82O8
G = -87952.12 (J) H = -74896.13 (J) S = 11.84 (J/K) V = 2.09 (cc) Cp = 6.58 (J/K)
albite anorthite sanidine
69.58 17.82 12.61

quartz mass = 26.40 (gm) density = 2.56 (gm/cc)

SiO2
G = -429914.29 (J)  H = -370258.22 (J)  S = 54.08 (J/K)  V = 10.32 (cc)  Cp = 30.85 (J/K)

rhm-oxide  mass = 0.66 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.76Mg0.08Fe'"0.17Al0.09Ti0.87O3
G = -6326.26 (J)  H = -4990.17 (J)  S = 1.21 (J/K)  V = 0.14 (cc)  Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.74 | 8.63 | 76.25 | 2.93 | 4.46 |

Total solids  mass = 77.32 (gm)  density = 2.65 (gm/cc)
G = -1211054.25 (J)  H = -1032786.56 (J)  S = 161.60 (J/K)  V = 29.19 (cc)  Cp = 90.33 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.58 (gm/cc)
G = -1575293.91 (J)  H = -1332934.00 (J)  S = 219.70 (J/K)  V = 38.70 (cc)  Cp = 120.67 (J/K)

Oxygen  delta moles = -0.00107354  delta grams = -0.034352
G = 264.27 (J)  H = -28.25 (J)  S = -0.27 (J/K)  V = -98.46 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 820.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = -0.08  COH = 1.21
IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 20.89 (gm)  density = 2.37 (gm/cc)  viscosity = 5.57 (log 10 poise)  (analysis in wt %)
G = -336055.52 (J)  H = -277157.96 (J)  S = 53.88 (J/K)  V = 8.81 (cc)  Cp = 28.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.08 | 0.37 | 12.67 | 0.26 | 0.00 | 0.86 | 0.24 | 0.12 | 0.00 | 0.00 | 1.65 | 3.36 | 5.30 | 0.29 | 4.80 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 6.73 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.63Mg0.20)3Al2Si3O12
G = -89249.96 (J)  H = -75182.61 (J)  S = 12.87 (J/K)  V = 1.69 (cc)  Cp = 7.20 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.01 | 17.28 | 19.71 |

orthopyroxene  mass = 0.74 (gm)  density = 3.61 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.11Mg0.80Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -9350.32 (J)  H = -7752.16 (J)  S = 1.46 (J/K)  V = 0.21 (cc)  Cp = 0.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.35 | 96.93 | 110.65 | 4.47 | -4.31 | 6.29 | 0.32 |

feldspar  mass = 38.31 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -601991.21 (J)  H = -512776.13 (J)  S = 81.61 (J/K)  V = 15.07 (cc)  Cp = 45.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.89 | 2.29 | 62.82 |

feldspar  mass = 5.59 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.12Na0.70Ca0.18Al1.18Si2.82O8
G = -90338.66 (J) H = -77099.70 (J) S = 12.11 (J/K) V = 2.15 (cc) Cp = 6.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.20 | 17.62 | 12.19 |

quartz mass = 27.02 (gm) density = 2.56 (gm/cc)
SiO2
G = -439514.50 (J) H = -379317.41 (J) S = 55.07 (J/K) V = 10.57 (cc) Cp = 31.55 (J/K)

rhm-oxide mass = 0.69 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.08Fe'"0.16Al0.09Ti0.87O3
G = -6584.56 (J) H = -5213.72 (J) S = 1.25 (J/K) V = 0.15 (cc) Cp = 0.63 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.06 | 8.18 | 76.35 | 3.05 | 4.34 |

Total solids mass = 79.08 (gm) density = 2.65 (gm/cc)
G = -1237029.21 (J) H = -1057341.75 (J) S = 164.38 (J/K) V = 29.83 (cc) Cp = 92.31 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1573084.73 (J) H = -1334499.71 (J) S = 218.25 (J/K) V = 38.64 (cc) Cp = 120.35 (J/K)

Oxygen delta moles = -0.00111047 delta grams = -0.0355338
G = 270.62 (J) H = -28.83 (J) S = -0.27 (J/K) V = -100.93 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 810.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.09 COH = 1.18 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 19.24 (gm) density = 2.36 (gm/cc) viscosity = 5.39 (log 10 poise) (analysis in wt %)
G = -309691.80 (J) H = -255593.91 (J) S = 49.94 (J/K) V = 8.14 (cc) Cp = 25.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.87 | 0.33 | 12.50 | 0.25 | 0.00 | 0.80 | 0.26 | 0.12 | 0.00 | 0.00 | 1.66 | 3.55 | 5.14 | 0.31 | 5.21 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.19 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.62Mg0.20)3Al2Si3O12
G = -95366.55 (J) H = -80549.53 (J) S = 13.68 (J/K) V = 1.81 (cc) Cp = 7.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.39 | 17.48 | 20.13 |

orthopyroxene mass = 0.50 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.83Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -6270.52 (J) H = -5217.89 (J) S = 0.97 (J/K) V = 0.14 (cc) Cp = 0.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.35 | 96.92 | 108.05 | 4.32 | -4.16 | 5.91 | 0.32 |

feldspar mass = 38.92 (gm) density = 2.54 (gm/cc) (analysis in mole %)

K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -610577.94 (J) H = -521259.64 (J) S = 82.46 (J/K) V = 15.31 (cc) Cp = 46.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.29 | 2.12 | 63.60 |

feldspar mass = 5.80 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.71Ca0.17Al1.17Si2.83O8
G = -93625.21 (J) H = -80082.05 (J) S = 12.50 (J/K) V = 2.23 (cc) Cp = 7.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.81 | 17.41 | 11.78 |

quartz mass = 27.61 (gm) density = 2.56 (gm/cc)
SiO2
G = -448557.28 (J) H = -387928.22 (J) S = 55.97 (J/K) V = 10.80 (cc) Cp = 32.20 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.08Fe'"0.16Al0.08Ti0.88O3
G = -6803.08 (J) H = -5407.02 (J) S = 1.29 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.39 | 7.77 | 76.44 | 3.17 | 4.24 |

Total solids mass = 80.73 (gm) density = 2.65 (gm/cc)
G = -1261200.58 (J) H = -1080444.35 (J) S = 166.88 (J/K) V = 30.44 (cc) Cp = 94.16 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1570892.38 (J) H = -1336038.25 (J) S = 216.83 (J/K) V = 38.58 (cc) Cp = 120.05 (J/K)

Oxygen delta moles = -0.00114274 delta grams = -0.0365662
G = 275.66 (J) H = -29.27 (J) S = -0.28 (J/K) V = -102.91 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 17.68 (gm) density = 2.35 (gm/cc) viscosity = 5.19 (log 10 poise) (analysis in wt %)
G = -284811.28 (J) H = -235181.08 (J) S = 46.25 (J/K) V = 7.52 (cc) Cp = 23.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.60 | 0.30 | 12.33 | 0.23 | 0.00 | 0.74 | 0.28 | 0.12 | 0.00 | 0.00 | 1.66 | 3.76 | 4.97 | 0.34 | 5.67 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.59 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.21)3Al2Si3O12
G = -100702.42 (J) H = -85281.19 (J) S = 14.37 (J/K) V = 1.91 (cc) Cp = 8.11 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.80 | 17.67 | 20.53 |

orthopyroxene mass = 0.28 (gm) density = 3.59 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.05Mg0.85Fe'''0.02Ti0.00Al0.10Si1.94O6
G = -3598.51 (J) H = -3005.26 (J) S = 0.55 (J/K) V = 0.08 (cc) Cp = 0.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.44 | 96.92 | 105.49 | 4.16 | -4.02 | 5.57 | 0.32 |

feldspar mass = 39.45 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -617806.89 (J) H = -528614.71 (J) S = 83.11 (J/K) V = 15.52 (cc) Cp = 46.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.67 | 1.95 | 64.38 |

feldspar mass = 6.06 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.71Ca0.17Al1.17Si2.83O8
G = -97641.20 (J) H = -83702.06 (J) S = 12.99 (J/K) V = 2.33 (cc) Cp = 7.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.42 | 17.20 | 11.38 |

quartz mass = 28.18 (gm) density = 2.56 (gm/cc)
SiO2
G = -457168.14 (J) H = -396196.29 (J) S = 56.82 (J/K) V = 11.02 (cc) Cp = 32.82 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.09Fe'''0.15Al0.08Ti0.88O3
G = -6987.90 (J) H = -5574.53 (J) S = 1.32 (J/K) V = 0.16 (cc) Cp = 0.67 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.72 | 7.37 | 76.50 | 3.27 | 4.14 |

Total solids mass = 82.28 (gm) density = 2.65 (gm/cc)
G = -1283905.06 (J) H = -1102374.04 (J) S = 169.16 (J/K) V = 31.01 (cc) Cp = 95.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1568716.34 (J) H = -1337555.12 (J) S = 215.40 (J/K) V = 38.53 (cc) Cp = 119.78 (J/K)

Oxygen delta moles = -0.00117113 delta grams = -0.0374746
G = 279.63 (J) H = -29.58 (J) S = -0.29 (J/K) V = -104.49 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 790.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.11 COH = 1.11 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 16.19 (gm) density = 2.34 (gm/cc) viscosity = 4.97 (log 10 poise) (analysis in wt %)
G = -261006.93 (J) H = -215585.84 (J) S = 42.72 (J/K) V = 6.91 (cc) Cp = 21.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.22 | 0.26 | 12.19 | 0.22 | 0.00 | 0.69 | 0.30 | 0.12 | 0.00 | 0.00 | 1.66 | 4.00 | 4.78 | 0.37 | 6.19 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.95 (gm) density = 3.96 (gm/cc) (analysis in mole %)

(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -105564.38 (J) H = -89626.01 (J) S = 14.99 (J/K) V = 2.01 (cc) Cp = 8.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.36 | 17.64 | 21.00 |

orthopyroxene mass = 0.04 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.88Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -541.48 (J) H = -453.80 (J) S = 0.08 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.79 | 96.96 | 103.09 | 4.04 | -3.91 | 5.28 | 0.33 |

clinopyroxene mass = 0.07 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.38Mg0.54Fe'"0.05Ti0.04Al0.21Si1.87O6
G = -962.45 (J) H = -823.82 (J) S = 0.13 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.20 | 9.60 | 38.23 | 7.94 | 0.65 | 4.45 | 8.94 |

feldspar mass = 40.00 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -625250.72 (J) H = -536180.18 (J) S = 83.78 (J/K) V = 15.73 (cc) Cp = 47.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.16 | 1.79 | 65.04 |

feldspar mass = 6.24 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.72Ca0.17Al1.17Si2.83O8
G = -100516.88 (J) H = -86356.20 (J) S = 13.32 (J/K) V = 2.40 (cc) Cp = 7.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.11 | 16.85 | 11.04 |

quartz mass = 28.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -465587.28 (J) H = -404327.79 (J) S = 57.62 (J/K) V = 11.23 (cc) Cp = 33.43 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.09Fe'"0.14Al0.08Ti0.89O3
G = -7127.40 (J) H = -5706.70 (J) S = 1.34 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.03 | 7.00 | 76.55 | 3.36 | 4.06 |

Total solids mass = 83.77 (gm) density = 2.65 (gm/cc)
G = -1305550.60 (J) H = -1123474.50 (J) S = 171.26 (J/K) V = 31.56 (cc) Cp = 97.59 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1566557.53 (J) H = -1339060.34 (J) S = 213.98 (J/K) V = 38.48 (cc) Cp = 119.53 (J/K)

Oxygen delta moles = -0.00119375 delta grams = -0.0381986
G = 282.10 (J) H = -29.73 (J) S = -0.29 (J/K) V = -105.52 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 780.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.12 COH = 1.07

IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 14.78 (gm) density = 2.33 (gm/cc) viscosity = 4.74 (log 10 poise) (analysis in wt %)
G = -238501.00 (J) H = -197010.14 (J) S = 39.40 (J/K) V = 6.34 (cc) Cp = 20.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.71 | 0.23 | 12.09 | 0.21 | 0.00 | 0.64 | 0.32 | 0.12 | 0.00 | 0.00 | 1.67 | 4.22 | 4.59 | 0.41 | 6.78 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.09 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -107294.01 (J) H = -91319.88 (J) S = 15.17 (J/K) V = 2.04 (cc) Cp = 8.63 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.14 | 17.83 | 21.03 |

clinopyroxene mass = 0.07 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.82Fe"0.37Mg0.55Fe'"0.05Ti0.05Al0.22Si1.87O6
G = -949.79 (J) H = -815.36 (J) S = 0.13 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.39 | 8.79 | 36.53 | 8.37 | 0.74 | 4.08 | 9.08 |

feldspar mass = 40.26 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -628250.35 (J) H = -539959.17 (J) S = 83.84 (J/K) V = 15.83 (cc) Cp = 47.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.40 | 1.65 | 65.95 |

feldspar mass = 6.79 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.73Ca0.17Al1.17Si2.83O8
G = -109122.65 (J) H = -93957.86 (J) S = 14.40 (J/K) V = 2.61 (cc) Cp = 8.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.63 | 16.77 | 10.60 |

quartz mass = 29.23 (gm) density = 2.56 (gm/cc)
SiO2
G = -473043.72 (J) H = -411650.66 (J) S = 58.29 (J/K) V = 11.43 (cc) Cp = 33.97 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.77Mg0.09Fe'"0.13Al0.08Ti0.89O3
G = -7252.16 (J) H = -5826.85 (J) S = 1.35 (J/K) V = 0.16 (cc) Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.15 | 6.66 | 76.77 | 3.43 | 4.00 |

Total solids mass = 85.18 (gm) density = 2.65 (gm/cc)
G = -1325912.69 (J) H = -1143529.78 (J) S = 173.18 (J/K) V = 32.09 (cc) Cp = 99.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1564413.69 (J) H = -1340539.93 (J) S = 212.58 (J/K) V = 38.43 (cc) Cp = 119.33 (J/K)

Oxygen delta moles = -0.00121486 delta grams = -0.038874

G = 284.10 (J)  H = -29.83 (J)  S = -0.30 (J/K)  V = -106.38 (cc)  Cp = -0.04 (J/K)

**********_____**********
Title: akosite

T = 770.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.54  delta HM = -5.16  NNO = 0.00  QFM = -0.14  COH = 1.04
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid  mass = 13.40 (gm)  density = 2.32 (gm/cc)  viscosity = 4.46 (log 10 poise)  (analysis in wt %)
G = -216413.86 (J)  H = -178701.60 (J)  S = 36.15 (J/K)  V = 5.78 (cc)  Cp = 18.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.06 | 0.20 | 11.99 | 0.21 | 0.00 | 0.61 | 0.36 | 0.12 | 0.00 | 0.00 | 1.69 | 4.48 | 4.36 | 0.45 | 7.48 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 8.18 (gm)  density = 3.96 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -108444.87 (J)  H = -92522.25 (J)  S = 15.26 (J/K)  V = 2.06 (cc)  Cp = 8.72 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.02 | 17.98 | 20.99 |

clinopyroxene  mass = 0.08 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.29Mg0.30Fe'"0.04Ti0.39Al0.72Si1.26O6
G = -1177.10 (J)  H = -1017.30 (J)  S = 0.15 (J/K)  V = 0.02 (cc)  Cp = 0.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.32 | 1.59 | 28.70 | 69.26 | 9.61 | -5.19 | 8.34 |

feldspar  mass = 40.53 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -631338.62 (J)  H = -543825.77 (J)  S = 83.89 (J/K)  V = 15.94 (cc)  Cp = 47.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.67 | 1.52 | 66.81 |

feldspar  mass = 7.30 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -117174.23 (J)  H = -101113.62 (J)  S = 15.40 (J/K)  V = 2.80 (cc)  Cp = 8.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.17 | 16.65 | 10.18 |

quartz  mass = 29.73 (gm)  density = 2.56 (gm/cc)
SiO2
G = -480572.41 (J)  H = -419062.10 (J)  S = 58.97 (J/K)  V = 11.62 (cc)  Cp = 34.51 (J/K)

rhm-oxide  mass = 0.75 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.77Mg0.09Fe'"0.13Al0.08Ti0.90O3
G = -7162.42 (J)  H = -5774.32 (J)  S = 1.33 (J/K)  V = 0.16 (cc)  Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.22 | 6.34 | 77.01 | 3.49 | 3.94 |

Total solids  mass = 86.56 (gm)  density = 2.65 (gm/cc)
G = -1345869.65 (J)  H = -1163315.35 (J)  S = 175.00 (J/K)  V = 32.61 (cc)  Cp = 100.82 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1562283.51 (J) H = -1342016.95 (J) S = 211.16 (J/K) V = 38.39 (cc) Cp = 119.16 (J/K)

Oxygen delta moles = -0.00123686 delta grams = -0.039578
G = 286.21 (J) H = -29.94 (J) S = -0.30 (J/K) V = -107.27 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 12.02 (gm) density = 2.30 (gm/cc) viscosity = 4.14 (log 10 poise) (analysis in wt %)
G = -194539.38 (J) H = -160496.22 (J) S = 32.95 (J/K) V = 5.22 (cc) Cp = 16.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.16 | 0.17 | 11.96 | 0.20 | 0.00 | 0.58 | 0.40 | 0.11 | 0.00 | 0.00 | 1.70 | 4.76 | 4.11 | 0.50 | 8.34 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.21 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -108581.22 (J) H = -92849.05 (J) S = 15.23 (J/K) V = 2.07 (cc) Cp = 8.74 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.21 | 17.91 | 20.88 |

clinopyroxene mass = 0.16 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.28Mg0.30Fe'"0.04Ti0.41Al0.74Si1.24O6
G = -2286.73 (J) H = -1981.47 (J) S = 0.30 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.63 | 1.46 | 28.16 | 71.65 | 9.51 | -5.50 | 8.34 |

feldspar mass = 40.80 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -634350.65 (J) H = -547637.95 (J) S = 83.93 (J/K) V = 16.04 (cc) Cp = 48.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.98 | 1.40 | 67.62 |

feldspar mass = 7.81 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -125314.55 (J) H = -108376.19 (J) S = 16.39 (J/K) V = 3.00 (cc) Cp = 9.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.73 | 16.46 | 9.80 |

quartz mass = 30.23 (gm) density = 2.56 (gm/cc)
SiO2
G = -488060.35 (J) H = -426463.66 (J) S = 59.62 (J/K) V = 11.82 (cc) Cp = 35.04 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.09Fe'"0.12Al0.08Ti0.90O3
G = -7036.71 (J) H = -5691.82 (J) S = 1.30 (J/K) V = 0.16 (cc) Cp = 0.67 (J/K)

geikielite hematite ilmenite pyrophanite corundum
9.18 6.03 77.34 3.52 3.92

Total solids mass = 87.94 (gm) density = 2.65 (gm/cc)
G = -1365630.21 (J) H = -1183000.14 (J) S = 176.77 (J/K) V = 33.13 (cc) Cp = 102.45 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1560169.59 (J) H = -1343496.36 (J) S = 209.72 (J/K) V = 38.35 (cc) Cp = 119.03 (J/K)

Oxygen delta moles = -0.00125511 delta grams = -0.040162
G = 287.36 (J) H = -29.94 (J) S = -0.31 (J/K) V = -107.81 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 750.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.16 COH = 0.97 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 10.62 (gm) density = 2.28 (gm/cc) viscosity = 3.74 (log 10 poise) (analysis in wt %)
G = -172237.69 (J) H = -141842.46 (J) S = 29.71 (J/K) V = 4.65 (cc) Cp = 14.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.94 | 0.14 | 11.94 | 0.20 | 0.00 | 0.56 | 0.45 | 0.10 | 0.00 | 0.00 | 1.73 | 5.12 | 3.81 | 0.57 | 9.44 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.23 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -108662.43 (J) H = -93128.41 (J) S = 15.18 (J/K) V = 2.07 (cc) Cp = 8.75 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.41 | 17.81 | 20.78 |

clinopyroxene mass = 0.23 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.28Mg0.30Fe'"0.04Ti0.42Al0.76Si1.23O6
G = -3333.74 (J) H = -2896.12 (J) S = 0.43 (J/K) V = 0.06 (cc) Cp = 0.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.70 | 1.34 | 27.67 | 73.70 | 9.41 | -5.77 | 8.35 |

feldspar mass = 41.05 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -637213.13 (J) H = -551332.95 (J) S = 83.94 (J/K) V = 16.14 (cc) Cp = 48.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.28 | 1.28 | 68.44 |

feldspar mass = 8.35 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.16Al1.16Si2.84O8
G = -133797.25 (J) H = -115966.81 (J) S = 17.43 (J/K) V = 3.20 (cc) Cp = 10.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.29 | 16.28 | 9.43 |

quartz mass = 30.75 (gm) density = 2.56 (gm/cc)

SiO2
G = -495925.59 (J)  H = -434221.04 (J)  S = 60.31 (J/K)  V = 12.03 (cc)  Cp = 35.61 (J/K)

rhm-oxide  mass = 0.72 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.78Mg0.09Fe'"0.11Al0.08Ti0.90O3
G = -6900.62 (J)  H = -5600.20 (J)  S = 1.27 (J/K)  V = 0.15 (cc)  Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.15 | 5.73 | 77.69 | 3.52 | 3.91 |

Total solids  mass = 89.34 (gm)  density = 2.65 (gm/cc)
G = -1385832.75 (J)  H = -1203145.53 (J)  S = 178.55 (J/K)  V = 33.66 (cc)  Cp = 104.17 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.61 (gm/cc)
G = -1558070.44 (J)  H = -1344987.99 (J)  S = 208.26 (J/K)  V = 38.31 (cc)  Cp = 118.95 (J/K)

Oxygen  delta moles = -0.00127277  delta grams = -0.0407272
G = 288.30 (J)  H = -29.92 (J)  S = -0.31 (J/K)  V = -108.27 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 740.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = -0.17  COH = 0.93
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 9.17 (gm)  density = 2.26 (gm/cc)  viscosity = 3.25 (log 10 poise)  (analysis in wt %)
G = -149209.02 (J)  H = -122503.39 (J)  S = 26.36 (J/K)  V = 4.06 (cc)  Cp = 12.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.25 | 0.12 | 11.91 | 0.20 | 0.00 | 0.55 | 0.52 | 0.09 | 0.00 | 0.00 | 1.79 | 5.56 | 3.45 | 0.66 | 10.90 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 8.20 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -107885.28 (J)  H = -92661.41 (J)  S = 15.03 (J/K)  V = 2.06 (cc)  Cp = 8.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.92 | 17.87 | 20.21 |

clinopyroxene  mass = 0.25 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.28Mg0.29Fe'"0.03Ti0.42Al0.78Si1.21O6
G = -3561.69 (J)  H = -3101.58 (J)  S = 0.45 (J/K)  V = 0.07 (cc)  Cp = 0.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -16.19 | 1.23 | 27.66 | 75.67 | 9.28 | -5.95 | 8.30 |

biotite  mass = 0.06 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -972.34 (J)  H = -838.40 (J)  S = 0.13 (J/K)  V = 0.02 (cc)  Cp = 0.08 (J/K)

| annite | phlogopite |
|---|---|
| 5.70 | 94.30 |

feldspar  mass = 41.16 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)

K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -637688.03 (J) H = -552971.45 (J) S = 83.62 (J/K) V = 16.18 (cc) Cp = 48.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.46 | 1.18 | 69.37 |

feldspar mass = 9.09 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.75Ca0.16Al1.16Si2.84O8
G = -145556.87 (J) H = -126438.66 (J) S = 18.87 (J/K) V = 3.49 (cc) Cp = 11.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.73 | 16.25 | 9.01 |

quartz mass = 31.30 (gm) density = 2.59 (gm/cc)
SiO2
G = -504208.42 (J) H = -443099.82 (J) S = 60.32 (J/K) V = 12.07 (cc) Cp = 42.20 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.78Mg0.09Fe'''0.11Al0.08Ti0.91O3
G = -6899.94 (J) H = -5617.03 (J) S = 1.27 (J/K) V = 0.16 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.87 | 5.45 | 78.31 | 3.47 | 3.90 |

Total solids mass = 90.79 (gm) density = 2.67 (gm/cc)
G = -1406772.59 (J) H = -1224728.34 (J) S = 179.68 (J/K) V = 34.05 (cc) Cp = 112.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1555981.60 (J) H = -1347231.73 (J) S = 206.04 (J/K) V = 38.11 (cc) Cp = 124.95 (J/K)

Oxygen delta moles = -0.0012881 delta grams = -0.0412175
G = 288.62 (J) H = -29.83 (J) S = -0.31 (J/K) V = -108.50 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 730.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.18 COH = 0.89
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 7.46 (gm) density = 2.22 (gm/cc) viscosity = 2.51 (log 10 poise) (analysis in wt %)
G = -121931.55 (J) H = -99438.64 (J) S = 22.42 (J/K) V = 3.36 (cc) Cp = 10.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.18 | 0.08 | 11.90 | 0.21 | 0.00 | 0.56 | 0.65 | 0.08 | 0.00 | 0.00 | 1.92 | 6.29 | 2.94 | 0.81 | 13.37 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.15 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.63Mg0.20)3Al2Si3O12
G = -106874.90 (J) H = -91988.22 (J) S = 14.84 (J/K) V = 2.05 (cc) Cp = 8.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.51 | 17.93 | 19.56 |

clinopyroxene mass = 0.24 (gm) density = 3.60 (gm/cc) (analysis in mole %)

cpx Na0.08Ca0.91Fe"0.28Mg0.28Fe'"0.03Ti0.43Al0.80Si1.19O6
G = -3461.59 (J) H = -3021.56 (J) S = 0.44 (J/K) V = 0.07 (cc) Cp = 0.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -17.81 | 1.12 | 27.75 | 77.71 | 9.08 | -6.06 | 8.20 |

biotite mass = 0.14 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -2168.56 (J) H = -1873.96 (J) S = 0.29 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

| annite | phlogopite |
|---|---|
| 5.88 | 94.12 |

feldspar mass = 41.28 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -638402.28 (J) H = -554822.42 (J) S = 83.32 (J/K) V = 16.22 (cc) Cp = 49.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.55 | 1.08 | 70.37 |

feldspar mass = 9.97 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.75Ca0.16Al1.16Si2.84O8
G = -159354.52 (J) H = -138732.45 (J) S = 20.56 (J/K) V = 3.82 (cc) Cp = 12.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.08 | 16.35 | 8.57 |

quartz mass = 32.00 (gm) density = 2.60 (gm/cc)
SiO2
G = -514770.65 (J) H = -453351.36 (J) S = 61.23 (J/K) V = 12.32 (cc) Cp = 42.76 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.79Mg0.09Fe'"0.10Al0.08Ti0.91O3
G = -6957.60 (J) H = -5681.51 (J) S = 1.27 (J/K) V = 0.16 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.53 | 5.17 | 79.04 | 3.33 | 3.93 |

Total solids mass = 92.50 (gm) density = 2.67 (gm/cc)
G = -1431990.09 (J) H = -1249471.47 (J) S = 181.95 (J/K) V = 34.69 (cc) Cp = 114.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1553921.64 (J) H = -1348910.11 (J) S = 204.37 (J/K) V = 38.05 (cc) Cp = 124.83 (J/K)

Oxygen delta moles = -0.00130318 delta grams = -0.0417003
G = 288.82 (J) H = -29.73 (J) S = -0.32 (J/K) V = -108.69 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: akosite

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.58 (log 10 poise)  (analysis in wt %)
G = -1690778.01 (J)  H = -1253029.60 (J)  S = 278.26 (J/K)  V = 41.17 (cc)  Cp = 140.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.58 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1690778.01 (J)  H = -1253029.60 (J)  S = 278.26 (J/K)  V = 41.17 (cc)  Cp = 140.15 (J/K)

Oxygen  delta moles = -1.63064e-16  delta grams = -5.21785e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.64 (log 10 poise)  (analysis in wt %)
G = -1688000.55 (J)  H = -1254431.61 (J)  S = 277.37 (J/K)  V = 41.14 (cc)  Cp = 140.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.64 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1688000.55 (J)  H = -1254431.61 (J)  S = 277.37 (J/K)  V = 41.14 (cc)  Cp = 140.14 (J/K)

Oxygen  delta moles = 1.31173e-06  delta grams = 4.19739e-05
G = -0.48 (J)  H = 0.06 (J)  S = 0.00 (J/K)  V = 0.17 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.71 (log 10 poise)  (analysis in wt %)
G = -1685232.15 (J)  H = -1255833.61 (J)  S = 276.47 (J/K)  V = 41.11 (cc)  Cp = 140.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1685232.15 (J)  H = -1255833.61 (J)  S = 276.47 (J/K)  V = 41.11 (cc)  Cp = 140.13 (J/K)

Oxygen  delta moles = 2.81076e-06  delta grams = 8.99411e-05
G = -1.01 (J)  H = 0.12 (J)  S = 0.00 (J/K)  V = 0.36 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.77 (log 10 poise)  (analysis in wt %)
G = -1682472.88 (J)  H = -1257235.61 (J)  S = 275.56 (J/K)  V = 41.08 (cc)  Cp = 140.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1682472.88 (J)  H = -1257235.61 (J)  S = 275.56 (J/K)  V = 41.08 (cc)  Cp = 140.12 (J/K)

Oxygen  delta moles = 4.50229e-06  delta grams = 0.000144068
G = -1.61 (J)  H = 0.19 (J)  S = 0.00 (J/K)  V = 0.58 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.83 (log 10 poise)  (analysis in wt %)
G = -1679722.79 (J)  H = -1258637.60 (J)  S = 274.65 (J/K)  V = 41.05 (cc)  Cp = 140.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1679722.79 (J)  H = -1258637.60 (J)  S = 274.65 (J/K)  V = 41.05 (cc)  Cp = 140.11 (J/K)

Oxygen  delta moles = 6.39174e-06  delta grams = 0.000204528
G = -2.27 (J)  H = 0.27 (J)  S = 0.00 (J/K)  V = 0.81 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.90 (log 10 poise)  (analysis in wt %)
G = -1676981.94 (J)  H = -1260039.60 (J)  S = 273.74 (J/K)  V = 41.02 (cc)  Cp = 140.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.90 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1676981.94 (J)  H = -1260039.60 (J)  S = 273.74 (J/K)  V = 41.02 (cc)  Cp = 140.10 (J/K)

Oxygen  delta moles = 8.48476e-06  delta grams = 0.000271502
G = -2.99 (J)  H = 0.35 (J)  S = 0.00 (J/K)  V = 1.07 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1240.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.17  COH = 2.08  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.96 (log 10 poise) (analysis in wt %)
G = -1674250.40 (J) H = -1261441.61 (J) S = 272.81 (J/K) V = 41.00 (cc) Cp = 140.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.96 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1674250.40 (J) H = -1261441.61 (J) S = 272.81 (J/K) V = 41.00 (cc) Cp = 140.09 (J/K)

Oxygen delta moles = 1.07872e-05 delta grams = 0.000345179
G = -3.77 (J) H = 0.44 (J) S = 0.00 (J/K) V = 1.36 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1230.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.16 COH = 2.06 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.03 (log 10 poise) (analysis in wt %)
G = -1671528.23 (J) H = -1262843.63 (J) S = 271.89 (J/K) V = 40.97 (cc) Cp = 140.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.03 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1671528.23 (J) H = -1262843.63 (J) S = 271.89 (J/K) V = 40.97 (cc) Cp = 140.08 (J/K)

Oxygen delta moles = 1.33053e-05 delta grams = 0.000425754
G = -4.62 (J) H = 0.54 (J) S = 0.00 (J/K) V = 1.66 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.10 (log 10 poise) (analysis in wt %)
G = -1668815.49 (J) H = -1264245.67 (J) S = 270.95 (J/K) V = 40.94 (cc) Cp = 140.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.46 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1668815.49 (J) H = -1264245.67 (J) S = 270.95 (J/K) V = 40.94 (cc) Cp = 140.07 (J/K)

Oxygen delta moles = 1.60454e-05 delta grams = 0.000513434
G = -5.53 (J) H = 0.65 (J) S = 0.00 (J/K) V = 1.99 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.17 (log 10 poise) (analysis in wt %)
G = -1666112.26 (J) H = -1265647.74 (J) S = 270.01 (J/K) V = 40.91 (cc) Cp = 140.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.47 | 0.00 | 2.31 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.17 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1666112.26 (J) H = -1265647.74 (J) S = 270.01 (J/K) V = 40.91 (cc) Cp = 140.06 (J/K)

Oxygen delta moles = 1.90142e-05 delta grams = 0.000608431
G = -6.51 (J) H = 0.76 (J) S = 0.00 (J/K) V = 2.34 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -1663418.46 (J) H = -1266994.04 (J) S = 269.10 (J/K) V = 40.88 (cc) Cp = 131.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.47 | 0.00 | 2.31 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.24 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1663418.46 (J) H = -1266994.04 (J) S = 269.10 (J/K) V = 40.88 (cc) Cp = 131.91 (J/K)

Oxygen delta moles = 2.22187e-05 delta grams = 0.00071097
G = -7.54 (J) H = 0.88 (J) S = 0.01 (J/K) V = 2.72 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.31 (log 10 poise) (analysis in wt %)
G = -1660733.77 (J) H = -1268314.57 (J) S = 268.20 (J/K) V = 40.85 (cc) Cp = 131.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.47 | 0.00 | 2.31 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1660733.77 (J) H = -1268314.57 (J) S = 268.20 (J/K) V = 40.85 (cc) Cp = 131.88 (J/K)

Oxygen delta moles = 2.56661e-05 delta grams = 0.000821284
G = -8.65 (J) H = 1.01 (J) S = 0.01 (J/K) V = 3.12 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1180.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.13 COH = 1.97 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1658058.21 (J) H = -1269634.92 (J) S = 267.30 (J/K) V = 40.83 (cc) Cp = 131.85 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.47 0.00 2.31 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1658058.21 (J) H = -1269634.92 (J) S = 267.30 (J/K) V = 40.83 (cc) Cp = 131.85 (J/K)

Oxygen delta moles = 2.93641e-05 delta grams = 0.000939617
G = -9.82 (J) H = 1.14 (J) S = 0.01 (J/K) V = 3.55 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1170.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.12 COH = 1.95 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.45 (log 10 poise) (analysis in wt %)
G = -1655391.87 (J) H = -1270955.10 (J) S = 266.39 (J/K) V = 40.80 (cc) Cp = 131.82 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.47 0.00 2.31 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1655391.87 (J) H = -1270955.10 (J) S = 266.39 (J/K) V = 40.80 (cc) Cp = 131.82 (J/K)

Oxygen delta moles = 3.33207e-05 delta grams = 0.00106622
G = -11.06 (J) H = 1.28 (J) S = 0.01 (J/K) V = 4.00 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1160.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.12 COH = 1.93 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -1652734.80 (J) H = -1272275.09 (J) S = 265.47 (J/K) V = 40.77 (cc) Cp = 131.78 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

73.28 0.40 12.72 0.47 0.00 2.31 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1652734.80 (J) H = -1272275.09 (J) S = 265.47 (J/K) V = 40.77 (cc) Cp = 131.78 (J/K)

Oxygen delta moles = 3.75442e-05 delta grams = 0.00120137
G = -12.36 (J) H = 1.43 (J) S = 0.01 (J/K) V = 4.47 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1150.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.11 COH = 1.91 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -1650087.06 (J) H = -1273594.90 (J) S = 264.55 (J/K) V = 40.74 (cc) Cp = 131.75 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.47 0.00 2.31 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.60 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1650087.06 (J) H = -1273594.90 (J) S = 264.55 (J/K) V = 40.74 (cc) Cp = 131.75 (J/K)

Oxygen delta moles = 4.20432e-05 delta grams = 0.00134533
G = -13.74 (J) H = 1.59 (J) S = 0.01 (J/K) V = 4.97 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1140.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.89 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1647448.72 (J) H = -1274914.51 (J) S = 263.62 (J/K) V = 40.71 (cc) Cp = 131.72 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
73.28 0.40 12.72 0.47 0.00 2.31 0.06 0.48 0.00 0.00 1.15 2.68 5.38 0.06 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.67 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1647448.72 (J) H = -1274914.51 (J) S = 263.62 (J/K) V = 40.71 (cc) Cp = 131.72 (J/K)

Oxygen delta moles = 4.6827e-05 delta grams = 0.00149841
G = -15.18 (J) H = 1.75 (J) S = 0.01 (J/K) V = 5.50 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1130.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.87 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -1644819.86 (J) H = -1276233.91 (J) S = 262.68 (J/K) V = 40.68 (cc) Cp = 131.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.31 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1644819.86 (J) H = -1276233.91 (J) S = 262.68 (J/K) V = 40.68 (cc) Cp = 131.68 (J/K)

Oxygen delta moles = 5.19049e-05 delta grams = 0.0016609
G = -16.69 (J) H = 1.92 (J) S = 0.01 (J/K) V = 6.06 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.83 (log 10 poise) (analysis in wt %)
G = -1642200.54 (J) H = -1277553.10 (J) S = 261.74 (J/K) V = 40.66 (cc) Cp = 131.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.28 | 0.40 | 12.72 | 0.48 | 0.00 | 2.30 | 0.06 | 0.48 | 0.00 | 0.00 | 1.15 | 2.68 | 5.38 | 0.06 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1642200.54 (J)  H = -1277553.10 (J)  S = 261.74 (J/K)  V = 40.66 (cc)  Cp = 131.64 (J/K)

Oxygen  delta moles = 5.72871e-05  delta grams = 0.00183312
G = -18.28 (J)  H = 2.10 (J)  S = 0.01 (J/K)  V = 6.64 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1110.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.08  COH = 1.83  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.29 (gm)  density = 2.46 (gm/cc)  viscosity = 5.88 (log 10 poise)  (analysis in wt %)
G = -1627578.71 (J)  H = -1269250.48 (J)  S = 259.07 (J/K)  V = 40.33 (cc)  Cp = 130.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 73.09 | 0.40 | 12.81 | 0.48 | 0.00 | 2.32 | 0.06 | 0.48 | 0.00 | 0.00 | 1.16 | 2.70 | 5.42 | 0.06 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz  mass = 0.71 (gm)  density = 2.56 (gm/cc)
SiO2
G = -12013.53 (J)  H = -9730.68 (J)  S = 1.65 (J/K)  V = 0.28 (cc)  Cp = 0.85 (J/K)

Total solids  mass = 0.71 (gm)  density = 2.56 (gm/cc)
G = -12013.53 (J)  H = -9730.68 (J)  S = 1.65 (J/K)  V = 0.28 (cc)  Cp = 0.85 (J/K)

Viscosity of the System: 5.89 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1639592.24 (J)  H = -1278981.16 (J)  S = 260.72 (J/K)  V = 40.61 (cc)  Cp = 131.59 (J/K)

Oxygen  delta moles = 6.4955e-05  delta grams = 0.00207848
G = -20.56 (J)  H = 2.36 (J)  S = 0.02 (J/K)  V = 7.47 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1100.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.07  COH = 1.81  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.48 (gm)  density = 2.46 (gm/cc)  viscosity = 5.93 (log 10 poise)  (analysis in wt %)
G = -1611278.51 (J)  H = -1259547.70 (J)  S = 256.15 (J/K)  V = 39.96 (cc)  Cp = 129.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.86 | 0.41 | 12.92 | 0.49 | 0.00 | 2.33 | 0.06 | 0.49 | 0.00 | 0.00 | 1.17 | 2.72 | 5.47 | 0.06 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 1.53 (gm) density = 2.56 (gm/cc)
SiO2
G = -25716.18 (J) H = -20876.38 (J) S = 3.52 (J/K) V = 0.60 (cc) Cp = 1.83 (J/K)

Total solids mass = 1.53 (gm) density = 2.56 (gm/cc)
G = -25716.18 (J) H = -20876.38 (J) S = 3.52 (J/K) V = 0.60 (cc) Cp = 1.83 (J/K)

Viscosity of the System: 5.96 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1636994.69 (J) H = -1280424.08 (J) S = 259.67 (J/K) V = 40.55 (cc) Cp = 131.53 (J/K)

Oxygen delta moles = 7.32849e-05 delta grams = 0.00234503
G = -23.01 (J) H = 2.64 (J) S = 0.02 (J/K) V = 8.37 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 97.67 (gm) density = 2.47 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -1595263.68 (J) H = -1250015.47 (J) S = 253.27 (J/K) V = 39.59 (cc) Cp = 128.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.64 | 0.41 | 13.03 | 0.50 | 0.00 | 2.35 | 0.06 | 0.49 | 0.00 | 0.00 | 1.18 | 2.74 | 5.51 | 0.06 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 2.33 (gm) density = 2.56 (gm/cc)
SiO2
G = -39144.11 (J) H = -31848.52 (J) S = 5.35 (J/K) V = 0.91 (cc) Cp = 2.78 (J/K)

Total solids mass = 2.33 (gm) density = 2.56 (gm/cc)
G = -39144.11 (J) H = -31848.52 (J) S = 5.35 (J/K) V = 0.91 (cc) Cp = 2.78 (J/K)

Viscosity of the System: 6.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1634407.79 (J) H = -1281863.99 (J) S = 258.62 (J/K) V = 40.50 (cc) Cp = 131.47 (J/K)

Oxygen delta moles = 8.19705e-05 delta grams = 0.00262296
G = -25.53 (J) H = 2.92 (J) S = 0.02 (J/K) V = 9.29 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1080.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.06 COH = 1.76 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 96.89 (gm) density = 2.47 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -1579527.11 (J) H = -1240649.51 (J) S = 250.44 (J/K) V = 39.24 (cc) Cp = 127.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.42 | 0.41 | 13.13 | 0.50 | 0.00 | 2.37 | 0.06 | 0.50 | 0.00 | 0.00 | 1.19 | 2.76 | 5.56 | 0.06 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 3.12 (gm) density = 2.56 (gm/cc)
SiO2
G = -52304.49 (J) H = -42651.45 (J) S = 7.13 (J/K) V = 1.22 (cc) Cp = 3.72 (J/K)

Total solids mass = 3.12 (gm) density = 2.56 (gm/cc)
G = -52304.49 (J) H = -42651.45 (J) S = 7.13 (J/K) V = 1.22 (cc) Cp = 3.72 (J/K)

Viscosity of the System: 6.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1631831.60 (J) H = -1283300.96 (J) S = 257.57 (J/K) V = 40.45 (cc) Cp = 131.41 (J/K)

Oxygen delta moles = 9.10251e-05 delta grams = 0.00291269
G = -28.11 (J) H = 3.21 (J) S = 0.02 (J/K) V = 10.24 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1070.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.05 COH = 1.74 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 96.11 (gm) density = 2.47 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -1564061.90 (J) H = -1231445.63 (J) S = 247.64 (J/K) V = 38.89 (cc) Cp = 126.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.20 | 0.42 | 13.24 | 0.51 | 0.00 | 2.38 | 0.06 | 0.50 | 0.00 | 0.00 | 1.20 | 2.79 | 5.60 | 0.06 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz mass = 3.89 (gm) density = 2.56 (gm/cc)
SiO2
G = -65204.27 (J) H = -53289.41 (J) S = 8.87 (J/K) V = 1.52 (cc) Cp = 4.64 (J/K)

Total solids mass = 3.89 (gm) density = 2.56 (gm/cc)
G = -65204.27 (J) H = -53289.41 (J) S = 8.87 (J/K) V = 1.52 (cc) Cp = 4.64 (J/K)

Viscosity of the System: 6.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1629266.17 (J) H = -1284735.04 (J) S = 256.51 (J/K) V = 40.40 (cc) Cp = 131.35 (J/K)

Oxygen delta moles = 0.000100463 delta grams = 0.00321468
G = -30.77 (J) H = 3.50 (J) S = 0.03 (J/K) V = 11.22 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1060.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.04  COH = 1.72  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.35 (gm)  density = 2.47 (gm/cc)  viscosity = 6.14 (log 10 poise)  (analysis in wt %)
G = -1548861.39 (J)  H = -1222399.80 (J)  S = 244.88 (J/K)  V = 38.54 (cc)  Cp = 125.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.97 | 0.42 | 13.34 | 0.52 | 0.00 | 2.40 | 0.06 | 0.50 | 0.00 | 0.00 | 1.21 | 2.81 | 5.65 | 0.06 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

quartz  mass = 4.65 (gm)  density = 2.56 (gm/cc)
SiO2
G = -77850.19 (J)  H = -63766.48 (J)  S = 10.56 (J/K)  V = 1.82 (cc)  Cp = 5.54 (J/K)

Total solids  mass = 4.65 (gm)  density = 2.56 (gm/cc)
G = -77850.19 (J)  H = -63766.48 (J)  S = 10.56 (J/K)  V = 1.82 (cc)  Cp = 5.54 (J/K)

Viscosity of the System: 6.23 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1626711.58 (J)  H = -1286166.28 (J)  S = 255.44 (J/K)  V = 40.36 (cc)  Cp = 131.29 (J/K)

Oxygen  delta moles = 0.000110298  delta grams = 0.00352939
G = -33.51 (J)  H = 3.81 (J)  S = 0.03 (J/K)  V = 12.23 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1050.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.04  COH = 1.70  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.01 (gm)  density = 2.47 (gm/cc)  viscosity = 6.23 (log 10 poise)  (analysis in wt %)
G = -1525526.49 (J)  H = -1207067.12 (J)  S = 240.68 (J/K)  V = 38.00 (cc)  Cp = 123.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.84 | 0.43 | 13.52 | 0.50 | 0.00 | 2.30 | 0.06 | 0.41 | 0.00 | 0.00 | 1.22 | 2.85 | 5.73 | 0.06 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.51 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.88Mg1.02Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -6997.62 (J)  H = -5502.55 (J)  S = 1.13 (J/K)  V = 0.15 (cc)  Cp = 0.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.50 | 97.35 | 88.42 | 3.72 | -3.62 | 6.23 | 0.39 |

quartz  mass = 5.48 (gm)  density = 2.56 (gm/cc)
SiO2
G = -91611.04 (J)  H = -75204.95 (J)  S = 12.40 (J/K)  V = 2.14 (cc)  Cp = 6.53 (J/K)

Total solids  mass = 5.99 (gm)  density = 2.62 (gm/cc)

G = -98608.66 (J)  H = -80707.50 (J)  S = 13.53 (J/K)  V = 2.29 (cc)  Cp = 7.12 (J/K)

Viscosity of the System: 6.34 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1624135.15 (J)  H = -1287774.62 (J)  S = 254.21 (J/K)  V = 40.29 (cc)  Cp = 131.08 (J/K)

Oxygen  delta moles = 5.73326e-05  delta grams = 0.00183457
G = -17.27 (J)  H = 1.96 (J)  S = 0.01 (J/K)  V = 6.31 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1040.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.03  COH = 1.67  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 92.98 (gm)  density = 2.48 (gm/cc)  viscosity = 6.31 (log 10 poise)  (analysis in wt %)
G = -1506704.46 (J)  H = -1195146.22 (J)  S = 237.26 (J/K)  V = 37.57 (cc)  Cp = 122.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.67 | 0.43 | 13.66 | 0.50 | 0.00 | 2.25 | 0.06 | 0.37 | 0.00 | 0.00 | 1.24 | 2.88 | 5.79 | 0.06 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.77 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg0.99Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -10542.21 (J)  H = -8300.03 (J)  S = 1.71 (J/K)  V = 0.22 (cc)  Cp = 0.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.88 | 97.28 | 91.49 | 3.96 | -3.84 | 6.59 | 0.40 |

quartz  mass = 6.25 (gm)  density = 2.56 (gm/cc)
SiO2
G = -104338.00 (J)  H = -85842.98 (J)  S = 14.08 (J/K)  V = 2.44 (cc)  Cp = 7.44 (J/K)

Total solids  mass = 7.02 (gm)  density = 2.64 (gm/cc)
G = -114880.21 (J)  H = -94143.01 (J)  S = 15.79 (J/K)  V = 2.66 (cc)  Cp = 8.34 (J/K)

Viscosity of the System: 6.43 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1621584.67 (J)  H = -1289289.24 (J)  S = 253.05 (J/K)  V = 40.23 (cc)  Cp = 130.93 (J/K)

Oxygen  delta moles = 3.14601e-05  delta grams = 0.00100669
G = -9.40 (J)  H = 1.06 (J)  S = 0.01 (J/K)  V = 3.43 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1030.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.02  COH = 1.65  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 91.96 (gm) density = 2.48 (gm/cc) viscosity = 6.38 (log 10 poise) (analysis in wt %)
G = -1488309.47 (J) H = -1183505.44 (J) S = 233.90 (J/K) V = 37.14 (cc) Cp = 121.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.51 | 0.44 | 13.81 | 0.49 | 0.00 | 2.19 | 0.07 | 0.34 | 0.00 | 0.00 | 1.25 | 2.91 | 5.85 | 0.07 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.04 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.95Mg0.95Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -13998.57 (J) H = -11035.14 (J) S = 2.27 (J/K) V = 0.29 (cc) Cp = 1.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.26 | 97.22 | 94.53 | 4.20 | -4.08 | 6.98 | 0.41 |

quartz mass = 7.00 (gm) density = 2.56 (gm/cc)
SiO2
G = -116736.79 (J) H = -96256.83 (J) S = 15.72 (J/K) V = 2.73 (cc) Cp = 8.33 (J/K)

Total solids mass = 8.04 (gm) density = 2.65 (gm/cc)
G = -130735.36 (J) H = -107291.97 (J) S = 17.99 (J/K) V = 3.03 (cc) Cp = 9.53 (J/K)

Viscosity of the System: 6.53 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1619044.84 (J) H = -1290797.41 (J) S = 251.89 (J/K) V = 40.17 (cc) Cp = 130.79 (J/K)

Oxygen delta moles = 3.74904e-06 delta grams = 0.000119965
G = -1.11 (J) H = 0.13 (J) S = 0.00 (J/K) V = 0.41 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: akosite

T = 1020.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.01 COH = 1.63 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 90.96 (gm) density = 2.48 (gm/cc) viscosity = 6.46 (log 10 poise) (analysis in wt %)
G = -1470320.66 (J) H = -1172129.76 (J) S = 230.59 (J/K) V = 36.72 (cc) Cp = 119.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.34 | 0.44 | 13.95 | 0.48 | 0.00 | 2.13 | 0.07 | 0.30 | 0.00 | 0.00 | 1.26 | 2.94 | 5.92 | 0.07 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.30 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.98Mg0.92Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -17374.85 (J) H = -13714.42 (J) S = 2.83 (J/K) V = 0.37 (cc) Cp = 1.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.61 | 97.16 | 97.53 | 4.46 | -4.34 | 7.38 | 0.43 |

quartz mass = 7.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -128820.18 (J) H = -106455.24 (J) S = 17.29 (J/K) V = 3.02 (cc) Cp = 9.20 (J/K)

Total solids mass = 9.04 (gm) density = 2.67 (gm/cc)

G = -146195.03 (J)  H = -120169.66 (J)  S = 20.13 (J/K)  V = 3.39 (cc)  Cp = 10.69 (J/K)

Viscosity of the System: 6.62 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1616515.69 (J)  H = -1292299.42 (J)  S = 250.72 (J/K)  V = 40.11 (cc)  Cp = 130.65 (J/K)

Oxygen  delta moles = -2.58124e-05  delta grams = -0.000825966
G = 7.58 (J)  H = -0.85 (J)  S = -0.01 (J/K)  V = -2.78 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 1010.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.00  COH = 1.60
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.98 (gm)  density = 2.48 (gm/cc)  viscosity = 6.54 (log 10 poise)  (analysis in wt %)
G = -1452720.29 (J)  H = -1161006.35 (J)  S = 227.34 (J/K)  V = 36.32 (cc)  Cp = 118.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.19 | 0.45 | 14.09 | 0.47 | 0.00 | 2.06 | 0.07 | 0.27 | 0.00 | 0.00 | 1.27 | 2.97 | 5.98 | 0.07 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.56 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.88Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -20676.87 (J)  H = -16342.70 (J)  S = 3.38 (J/K)  V = 0.44 (cc)  Cp = 1.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.91 | 97.10 | 100.45 | 4.73 | -4.60 | 7.79 | 0.44 |

quartz  mass = 8.45 (gm)  density = 2.56 (gm/cc)
SiO2
G = -140600.14 (J)  H = -116446.37 (J)  S = 18.82 (J/K)  V = 3.30 (cc)  Cp = 10.04 (J/K)

Total solids  mass = 10.01 (gm)  density = 2.68 (gm/cc)
G = -161277.01 (J)  H = -132789.08 (J)  S = 22.20 (J/K)  V = 3.74 (cc)  Cp = 11.83 (J/K)

Viscosity of the System: 6.72 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1613997.30 (J)  H = -1293795.43 (J)  S = 249.54 (J/K)  V = 40.06 (cc)  Cp = 130.51 (J/K)

Oxygen  delta moles = -5.72057e-05  delta grams = -0.00183051
G = 16.65 (J)  H = -1.87 (J)  S = -0.01 (J/K)  V = -6.10 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 1000.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = -0.00  COH = 1.58
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 85.12 (gm) density = 2.48 (gm/cc) viscosity = 6.57 (log 10 poise) (analysis in wt %)
G = -1372092.70 (J) H = -1098981.13 (J) S = 214.52 (J/K) V = 34.36 (cc) Cp = 112.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.04 | 0.47 | 14.14 | 0.47 | 0.00 | 2.04 | 0.07 | 0.24 | 0.00 | 0.00 | 1.28 | 2.89 | 6.11 | 0.07 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.94 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.84Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -25400.57 (J) H = -20091.65 (J) S = 4.17 (J/K) V = 0.54 (cc) Cp = 2.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.47 | 97.10 | 104.62 | 4.90 | -4.77 | 8.18 | 0.44 |

feldspar mass = 3.10 (gm) density = 2.56 (gm/cc) (analysis in mole %)
K0.33Na0.59Ca0.07Al1.07Si2.93O8
G = -50579.61 (J) H = -41337.84 (J) S = 7.26 (J/K) V = 1.21 (cc) Cp = 3.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.30 | 7.46 | 33.24 |

quartz mass = 9.84 (gm) density = 2.56 (gm/cc)
SiO2
G = -163404.73 (J) H = -135631.23 (J) S = 21.81 (J/K) V = 3.84 (cc) Cp = 11.68 (J/K)

Total solids mass = 14.88 (gm) density = 2.66 (gm/cc)
G = -239384.92 (J) H = -197060.73 (J) S = 33.24 (J/K) V = 5.60 (cc) Cp = 17.64 (J/K)

Viscosity of the System: 6.86 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1611477.62 (J) H = -1296041.85 (J) S = 247.76 (J/K) V = 39.96 (cc) Cp = 129.89 (J/K)

Oxygen delta moles = -0.000116507 delta grams = -0.00372809
G = 33.62 (J) H = -3.77 (J) S = -0.03 (J/K) V = -12.33 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: akosite

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 78.05 (gm) density = 2.48 (gm/cc) viscosity = 6.57 (log 10 poise) (analysis in wt %)
G = -1256255.68 (J) H = -1008164.46 (J) S = 196.41 (J/K) V = 31.52 (cc) Cp = 102.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.88 | 0.51 | 14.14 | 0.47 | 0.00 | 2.04 | 0.08 | 0.21 | 0.00 | 0.00 | 1.32 | 2.78 | 6.20 | 0.08 | 1.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.37 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.79Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -30607.35 (J) H = -24225.05 (J) S = 5.05 (J/K) V = 0.66 (cc) Cp = 2.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.36 | 97.11 | 109.13 | 5.04 | -4.90 | 8.56 | 0.42 |

feldspar mass = 8.02 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.39Na0.55Ca0.06Al1.06Si2.94O8
G = -130376.57 (J) H = -106783.92 (J) S = 18.68 (J/K) V = 3.14 (cc) Cp = 9.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.00 | 6.40 | 38.60 |

quartz mass = 11.56 (gm) density = 2.56 (gm/cc)
SiO2
G = -191730.36 (J) H = -159491.87 (J) S = 25.52 (J/K) V = 4.51 (cc) Cp = 13.71 (J/K)

Total solids mass = 21.94 (gm) density = 2.64 (gm/cc)
G = -352714.28 (J) H = -290500.84 (J) S = 49.25 (J/K) V = 8.32 (cc) Cp = 26.08 (J/K)

Viscosity of the System: 7.04 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1608969.96 (J) H = -1298665.30 (J) S = 245.66 (J/K) V = 39.83 (cc) Cp = 129.00 (J/K)

Oxygen delta moles = -0.000191814 delta grams = -0.00613783
G = 54.87 (J) H = -6.14 (J) S = -0.05 (J/K) V = -20.14 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 980.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = -0.02 COH = 1.53 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 71.54 (gm) density = 2.48 (gm/cc) viscosity = 6.56 (log 10 poise) (analysis in wt %)
G = -1150050.88 (J) H = -924702.40 (J) S = 179.83 (J/K) V = 28.90 (cc) Cp = 94.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.73 | 0.56 | 14.15 | 0.47 | 0.00 | 2.03 | 0.08 | 0.18 | 0.00 | 0.00 | 1.37 | 2.68 | 6.25 | 0.08 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.77 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.13Mg0.75Fe"'0.04Ti0.00Al0.15Si1.91O6
G = -35339.62 (J) H = -27994.99 (J) S = 5.86 (J/K) V = 0.77 (cc) Cp = 3.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -119.70 | 97.09 | 113.14 | 5.18 | -5.02 | 8.91 | 0.41 |

feldspar mass = 12.56 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.42Na0.52Ca0.06Al1.06Si2.94O8
G = -203585.42 (J) H = -167124.53 (J) S = 29.10 (J/K) V = 4.92 (cc) Cp = 15.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 52.37 | 5.97 | 41.65 |

quartz mass = 13.13 (gm) density = 2.56 (gm/cc)
SiO2
G = -217508.03 (J) H = -181331.50 (J) S = 28.87 (J/K) V = 5.13 (cc) Cp = 15.56 (J/K)

Total solids mass = 28.45 (gm) density = 2.63 (gm/cc)

G = -456433.08 (J)  H = -376451.02 (J)  S = 63.82 (J/K)  V = 10.82 (cc)  Cp = 33.81 (J/K)

Viscosity of the System: 7.25 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.52 (gm/cc)
G = -1606483.96 (J)  H = -1301153.43 (J)  S = 243.65 (J/K)  V = 39.72 (cc)  Cp = 128.18 (J/K)

Oxygen  delta moles = -0.000265222  delta grams = -0.00848678
G = 75.21 (J)  H = -8.39 (J)  S = -0.07 (J/K)  V = -27.63 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 970.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = -0.03  COH = 1.50  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 65.72 (gm)  density = 2.47 (gm/cc)  viscosity = 6.55 (log 10 poise)  (analysis in wt %)
G = -1055456.72 (J)  H = -850260.68 (J)  S = 165.06 (J/K)  V = 26.57 (cc)  Cp = 86.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.58 | 0.61 | 14.16 | 0.47 | 0.00 | 2.01 | 0.09 | 0.16 | 0.00 | 0.00 | 1.42 | 2.60 | 6.27 | 0.09 | 1.53 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.13 (gm)  density = 3.62 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.17Mg0.71Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -39619.67 (J)  H = -31420.88 (J)  S = 6.60 (J/K)  V = 0.86 (cc)  Cp = 3.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -123.50 | 97.06 | 116.65 | 5.32 | -5.14 | 9.23 | 0.40 |

feldspar  mass = 16.60 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.44Na0.51Ca0.06Al1.06Si2.94O8
G = -268483.19 (J)  H = -220909.64 (J)  S = 38.27 (J/K)  V = 6.51 (cc)  Cp = 19.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 50.60 | 5.81 | 43.59 |

quartz  mass = 14.53 (gm)  density = 2.56 (gm/cc)
SiO2
G = -240459.68 (J)  H = -200903.80 (J)  S = 31.82 (J/K)  V = 5.68 (cc)  Cp = 17.21 (J/K)

Total solids  mass = 34.27 (gm)  density = 2.63 (gm/cc)
G = -548562.54 (J)  H = -453234.32 (J)  S = 76.68 (J/K)  V = 13.05 (cc)  Cp = 40.70 (J/K)

Viscosity of the System: 7.48 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.52 (gm/cc)
G = -1604019.26 (J)  H = -1303494.99 (J)  S = 241.74 (J/K)  V = 39.62 (cc)  Cp = 127.43 (J/K)

Oxygen  delta moles = -0.000335506  delta grams = -0.0107358
G = 94.29 (J)  H = -10.50 (J)  S = -0.08 (J/K)  V = -34.68 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 960.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = -0.04  COH = 1.47  IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 60.55 (gm)  density = 2.47 (gm/cc)  viscosity = 6.53 (log 10 poise)  (analysis in wt %)
G = -971588.53 (J)  H = -784184.02 (J)  S = 151.97 (J/K)  V = 24.49 (cc)  Cp = 79.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.43 | 0.66 | 14.18 | 0.47 | 0.00 | 1.97 | 0.10 | 0.15 | 0.00 | 0.00 | 1.47 | 2.54 | 6.28 | 0.10 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.47 (gm)  density = 3.64 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.20Mg0.67Fe"'0.04Ti0.00Al0.15Si1.90O6
G = -43481.90 (J)  H = -34530.83 (J)  S = 7.26 (J/K)  V = 0.95 (cc)  Cp = 3.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -126.80 | 97.02 | 119.71 | 5.45 | -5.25 | 9.50 | 0.39 |

feldspar  mass = 20.18 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.45Na0.49Ca0.06Al1.06Si2.94O8
G = -325660.55 (J)  H = -268579.04 (J)  S = 46.29 (J/K)  V = 7.91 (cc)  Cp = 24.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.29 | 5.76 | 44.95 |

quartz  mass = 15.79 (gm)  density = 2.56 (gm/cc)
SiO2
G = -260844.14 (J)  H = -218410.02 (J)  S = 34.41 (J/K)  V = 6.17 (cc)  Cp = 18.68 (J/K)

Total solids  mass = 39.44 (gm)  density = 2.62 (gm/cc)
G = -629986.60 (J)  H = -521519.89 (J)  S = 87.96 (J/K)  V = 15.03 (cc)  Cp = 46.79 (J/K)

Viscosity of the System: 7.78 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.53 (gm/cc)
G = -1601575.12 (J)  H = -1305703.91 (J)  S = 239.93 (J/K)  V = 39.53 (cc)  Cp = 126.75 (J/K)

Oxygen  delta moles = -0.000402221  delta grams = -0.0128706
G = 112.03 (J)  H = -12.44 (J)  S = -0.10 (J/K)  V = -41.24 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: akosite

T = 950.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = -0.05  COH = 1.45  IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 55.95 (gm)  density = 2.47 (gm/cc)  viscosity = 6.52 (log 10 poise)  (analysis in wt %)
G = -897107.39 (J)  H = -725438.90 (J)  S = 140.35 (J/K)  V = 22.65 (cc)  Cp = 73.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.29 | 0.71 | 14.20 | 0.46 | 0.00 | 1.92 | 0.11 | 0.13 | 0.00 | 0.00 | 1.52 | 2.47 | 6.28 | 0.11 | 1.79 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.78 (gm) density = 3.65 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.22Mg0.64Fe"'0.04Ti0.00Al0.16Si1.90O6
G = -46957.37 (J) H = -37349.59 (J) S = 7.85 (J/K) V = 1.04 (cc) Cp = 4.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -129.65 | 96.98 | 122.36 | 5.57 | -5.36 | 9.72 | 0.38 |

feldspar mass = 23.35 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.46Na0.48Ca0.06Al1.06Si2.94O8
G = -376088.12 (J) H = -310890.25 (J) S = 53.30 (J/K) V = 9.16 (cc) Cp = 28.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.26 | 5.77 | 45.96 |

quartz mass = 16.91 (gm) density = 2.56 (gm/cc)
SiO2
G = -278997.90 (J) H = -234118.42 (J) S = 36.69 (J/K) V = 6.60 (cc) Cp = 19.99 (J/K)

Total solids mass = 44.04 (gm) density = 2.62 (gm/cc)
G = -702043.38 (J) H = -582358.27 (J) S = 97.85 (J/K) V = 16.80 (cc) Cp = 52.20 (J/K)

Viscosity of the System: 8.17 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1599150.77 (J) H = -1307797.16 (J) S = 238.20 (J/K) V = 39.44 (cc) Cp = 126.13 (J/K)

Oxygen delta moles = -0.000465164 delta grams = -0.0148847
G = 128.40 (J) H = -14.22 (J) S = -0.12 (J/K) V = -47.31 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 940.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = -0.06 COH = 1.42 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 51.84 (gm) density = 2.47 (gm/cc) viscosity = 6.50 (log 10 poise) (analysis in wt %)
G = -830722.57 (J) H = -673021.34 (J) S = 129.99 (J/K) V = 21.00 (cc) Cp = 68.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.14 | 0.77 | 14.22 | 0.45 | 0.00 | 1.87 | 0.12 | 0.12 | 0.00 | 0.00 | 1.57 | 2.42 | 6.28 | 0.12 | 1.93 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.06 (gm) density = 3.66 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.25Mg0.62Fe"'0.04Ti0.00Al0.16Si1.90O6
G = -50074.74 (J) H = -39899.41 (J) S = 8.39 (J/K) V = 1.11 (cc) Cp = 4.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -132.09 | 96.93 | 124.65 | 5.69 | -5.45 | 9.90 | 0.38 |

feldspar mass = 26.17 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.47Na0.47Ca0.06Al1.06Si2.94O8
G = -420711.50 (J) H = -348587.45 (J) S = 59.45 (J/K) V = 10.26 (cc) Cp = 31.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 47.42 | 5.82 | 46.76 |

quartz mass = 17.92 (gm) density = 2.56 (gm/cc)
SiO2
G = -295236.69 (J) H = -248282.29 (J) S = 38.70 (J/K) V = 7.00 (cc) Cp = 21.16 (J/K)

Total solids mass = 48.15 (gm) density = 2.62 (gm/cc)
G = -766022.92 (J) H = -636769.14 (J) S = 106.54 (J/K) V = 18.36 (cc) Cp = 57.01 (J/K)

Viscosity of the System: 8.85 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1596745.49 (J) H = -1309790.49 (J) S = 236.54 (J/K) V = 39.37 (cc) Cp = 125.56 (J/K)

Oxygen delta moles = -0.00052426 delta grams = -0.0167757
G = 143.40 (J) H = -15.84 (J) S = -0.13 (J/K) V = -52.88 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 930.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = -0.07 COH = 1.39 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 48.13 (gm) density = 2.47 (gm/cc) viscosity = 6.47 (log 10 poise) (analysis in wt %)
G = -770830.72 (J) H = -625655.61 (J) S = 120.66 (J/K) V = 19.52 (cc) Cp = 63.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.01 | 0.83 | 14.23 | 0.44 | 0.00 | 1.80 | 0.13 | 0.11 | 0.00 | 0.00 | 1.59 | 2.38 | 6.28 | 0.13 | 2.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.31 (gm) density = 3.67 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.27Mg0.60Fe'"0.05Ti0.00Al0.16Si1.90O6
G = -52873.26 (J) H = -42209.66 (J) S = 8.86 (J/K) V = 1.18 (cc) Cp = 4.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -134.25 | 96.92 | 126.67 | 5.79 | -5.53 | 10.03 | 0.37 |

feldspar mass = 26.60 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.49Na0.45Ca0.05Al1.05Si2.95O8
G = -426354.43 (J) H = -354069.83 (J) S = 60.08 (J/K) V = 10.43 (cc) Cp = 31.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.28 | 5.34 | 49.38 |

feldspar mass = 2.10 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.21Na0.64Ca0.15Al1.15Si2.85O8
G = -34159.83 (J) H = -28408.15 (J) S = 4.78 (J/K) V = 0.81 (cc) Cp = 2.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.80 | 14.72 | 21.47 |

quartz mass = 18.84 (gm) density = 2.56 (gm/cc)
SiO2
G = -310140.21 (J) H = -261379.67 (J) S = 40.53 (J/K) V = 7.36 (cc) Cp = 22.24 (J/K)

Total solids mass = 51.85 (gm) density = 2.62 (gm/cc)

G = -823527.73 (J)  H = -686067.31 (J)  S = 114.25 (J/K)  V = 19.78 (cc)  Cp = 61.35 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.98 (gm)  density = 2.54 (gm/cc)
G = -1594358.45 (J)  H = -1311722.92 (J)  S = 234.91 (J/K)  V = 39.30 (cc)  Cp = 125.03 (J/K)

Oxygen  delta moles = -0.000579986  delta grams = -0.0185588
G = 157.19 (J)  H = -17.32 (J)  S = -0.15 (J/K)  V = -58.02 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: akosite

T = 920.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = -0.08  COH = 1.36
IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 44.25 (gm)  density = 2.46 (gm/cc)  viscosity = 6.41 (log 10 poise)  (analysis in wt %)
G = -708621.29 (J)  H = -576078.43 (J)  S = 111.09 (J/K)  V = 17.98 (cc)  Cp = 58.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.90 | 14.01 | 0.41 | 0.00 | 1.68 | 0.14 | 0.11 | 0.00 | 0.00 | 1.60 | 2.47 | 6.22 | 0.14 | 2.27 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 1.62 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.15Fe"0.67Mg0.18)3Al2Si3O12
G = -21548.87 (J)  H = -17673.20 (J)  S = 3.25 (J/K)  V = 0.41 (cc)  Cp = 1.75 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 66.93 | 14.77 | 18.30 |

orthopyroxene  mass = 3.47 (gm)  density = 3.66 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.25Mg0.62Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -42576.12 (J)  H = -34111.68 (J)  S = 7.09 (J/K)  V = 0.95 (cc)  Cp = 3.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -132.18 | 96.86 | 125.15 | 5.63 | -5.35 | 9.51 | 0.38 |

feldspar  mass = 29.44 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.51Na0.44Ca0.05Al1.05Si2.95O8
G = -471044.48 (J)  H = -392074.28 (J)  S = 66.19 (J/K)  V = 11.55 (cc)  Cp = 35.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 44.47 | 4.92 | 50.61 |

feldspar  mass = 1.16 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)
K0.21Na0.65Ca0.15Al1.15Si2.85O8
G = -18805.41 (J)  H = -15675.61 (J)  S = 2.62 (J/K)  V = 0.45 (cc)  Cp = 1.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.63 | 14.80 | 20.57 |

quartz  mass = 20.04 (gm)  density = 2.56 (gm/cc)
SiO2
G = -329349.69 (J)  H = -278167.77 (J)  S = 42.90 (J/K)  V = 7.83 (cc)  Cp = 23.63 (J/K)

Total solids  mass = 55.73 (gm)  density = 2.63 (gm/cc)

G = -883324.57 (J)  H = -737702.54 (J)  S = 122.05 (J/K)  V = 21.18 (cc)  Cp = 65.78 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.98 (gm)  density = 2.55 (gm/cc)
G = -1591945.85 (J)  H = -1313780.97 (J)  S = 233.13 (J/K)  V = 39.16 (cc)  Cp = 124.37 (J/K)

Oxygen  delta moles = -0.00071577  delta grams = -0.0229038
G = 192.20 (J)  H = -21.12 (J)  S = -0.18 (J/K)  V = -71.01 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 910.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = -0.09  COH = 1.34
IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid  mass = 40.15 (gm)  density = 2.45 (gm/cc)  viscosity = 6.34 (log 10 poise)  (analysis in wt %)
G = -643494.52 (J)  H = -523920.80 (J)  S = 101.06 (J/K)  V = 16.38 (cc)  Cp = 53.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.24 | 0.79 | 13.80 | 0.38 | 0.00 | 1.53 | 0.15 | 0.12 | 0.00 | 0.00 | 1.62 | 2.60 | 6.14 | 0.15 | 2.50 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 3.10 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.15Fe"0.66Mg0.19)3Al2Si3O12
G = -41199.59 (J)  H = -33891.42 (J)  S = 6.18 (J/K)  V = 0.78 (cc)  Cp = 3.33 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.91 | 15.21 | 18.88 |

orthopyroxene  mass = 2.57 (gm)  density = 3.65 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.22Mg0.65Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -31809.27 (J)  H = -25595.57 (J)  S = 5.25 (J/K)  V = 0.70 (cc)  Cp = 2.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -128.28 | 96.76 | 122.00 | 5.44 | -5.18 | 8.87 | 0.38 |

feldspar  mass = 32.07 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.52Na0.43Ca0.05Al1.05Si2.95O8
G = -511966.96 (J)  H = -427108.46 (J)  S = 71.72 (J/K)  V = 12.59 (cc)  Cp = 38.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 43.38 | 4.52 | 52.10 |

feldspar  mass = 0.58 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)
K0.20Na0.65Ca0.15Al1.15Si2.85O8
G = -9450.85 (J)  H = -7896.54 (J)  S = 1.31 (J/K)  V = 0.22 (cc)  Cp = 0.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.40 | 15.07 | 19.52 |

quartz  mass = 21.32 (gm)  density = 2.56 (gm/cc)
SiO2
G = -349889.55 (J)  H = -296151.42 (J)  S = 45.42 (J/K)  V = 8.33 (cc)  Cp = 25.11 (J/K)

rhm-oxide  mass = 0.18 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)

Mn0.02Fe"0.75Mg0.07Fe'"0.21Al0.11Ti0.84O3
G = -1773.00 (J) H = -1359.66 (J) S = 0.35 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.76 | 10.57 | 74.82 | 2.23 | 5.62 |

Total solids mass = 59.83 (gm) density = 2.64 (gm/cc)
G = -946089.22 (J) H = -792003.07 (J) S = 130.23 (J/K) V = 22.66 (cc) Cp = 70.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1589583.74 (J) H = -1315923.87 (J) S = 231.30 (J/K) V = 39.04 (cc) Cp = 123.68 (J/K)

Oxygen delta moles = -0.000791662 delta grams = -0.0253322
G = 210.60 (J) H = -23.08 (J) S = -0.20 (J/K) V = -77.88 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 900.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.10 COH = 1.31 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 36.78 (gm) density = 2.44 (gm/cc) viscosity = 6.26 (log 10 poise) (analysis in wt %)
G = -589706.32 (J) H = -480833.70 (J) S = 92.80 (J/K) V = 15.05 (cc) Cp = 48.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.35 | 0.74 | 13.60 | 0.36 | 0.00 | 1.40 | 0.15 | 0.12 | 0.00 | 0.00 | 1.63 | 2.72 | 6.05 | 0.16 | 2.73 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.29 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.65Mg0.19)3Al2Si3O12
G = -57126.90 (J) H = -47130.09 (J) S = 8.52 (J/K) V = 1.08 (cc) Cp = 4.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.06 | 15.59 | 19.35 |

orthopyroxene mass = 1.90 (gm) density = 3.64 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.19Mg0.69Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -23588.10 (J) H = -19057.94 (J) S = 3.86 (J/K) V = 0.52 (cc) Cp = 2.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -124.86 | 96.69 | 119.23 | 5.26 | -5.02 | 8.31 | 0.39 |

feldspar mass = 34.02 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.53Na0.42Ca0.04Al1.04Si2.96O8
G = -541930.98 (J) H = -453137.22 (J) S = 75.69 (J/K) V = 13.35 (cc) Cp = 40.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 42.49 | 4.17 | 53.34 |

feldspar mass = 0.33 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.19Na0.66Ca0.15Al1.15Si2.85O8
G = -5368.11 (J) H = -4495.71 (J) S = 0.74 (J/K) V = 0.13 (cc) Cp = 0.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.15 | 15.19 | 18.66 |

quartz mass = 22.37 (gm) density = 2.56 (gm/cc)
SiO2
G = -366800.45 (J) H = -311131.12 (J) S = 47.45 (J/K) V = 8.74 (cc) Cp = 26.34 (J/K)

rhm-oxide mass = 0.28 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.75Mg0.07Fe'"0.20Al0.11Ti0.85O3
G = -2718.90 (J) H = -2093.68 (J) S = 0.53 (J/K) V = 0.06 (cc) Cp = 0.27 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.13 | 10.00 | 75.03 | 2.40 | 5.44 |

Total solids mass = 63.20 (gm) density = 2.65 (gm/cc)
G = -997533.44 (J) H = -837045.76 (J) S = 136.80 (J/K) V = 23.88 (cc) Cp = 74.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1587239.76 (J) H = -1317879.46 (J) S = 229.60 (J/K) V = 38.93 (cc) Cp = 123.10 (J/K)

Oxygen delta moles = -0.000865982 delta grams = -0.0277104
G = 228.22 (J) H = -24.93 (J) S = -0.22 (J/K) V = -84.47 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 33.79 (gm) density = 2.44 (gm/cc) viscosity = 6.17 (log 10 poise) (analysis in wt %)
G = -542084.74 (J) H = -442631.01 (J) S = 85.50 (J/K) V = 13.87 (cc) Cp = 44.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.42 | 0.69 | 13.41 | 0.33 | 0.00 | 1.28 | 0.16 | 0.12 | 0.00 | 0.00 | 1.63 | 2.85 | 5.96 | 0.18 | 2.97 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.28 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.64Mg0.20)3Al2Si3O12
G = -70312.92 (J) H = -58175.46 (J) S = 10.43 (J/K) V = 1.33 (cc) Cp = 5.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.24 | 15.93 | 19.82 |

orthopyroxene mass = 1.35 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.16Mg0.72Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -16871.54 (J) H = -13686.42 (J) S = 2.74 (J/K) V = 0.37 (cc) Cp = 1.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -121.46 | 96.62 | 116.43 | 5.08 | -4.85 | 7.79 | 0.39 |

feldspar mass = 35.56 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.55Na0.42Ca0.04Al1.04Si2.96O8
G = -565227.40 (J) H = -473694.28 (J) S = 78.69 (J/K) V = 13.96 (cc) Cp = 42.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.63 | 3.85 | 54.52 |

feldspar mass = 0.32 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.18Na0.67Ca0.15Al1.15Si2.85O8
G = -5134.11 (J) H = -4309.71 (J) S = 0.71 (J/K) V = 0.12 (cc) Cp = 0.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.87 | 15.26 | 17.87 |

quartz mass = 23.32 (gm) density = 2.56 (gm/cc)
SiO2
G = -381777.73 (J) H = -324528.13 (J) S = 49.22 (J/K) V = 9.11 (cc) Cp = 27.42 (J/K)

rhm-oxide mass = 0.36 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.07Fe'''0.19Al0.11Ti0.85O3
G = -3510.56 (J) H = -2714.32 (J) S = 0.68 (J/K) V = 0.08 (cc) Cp = 0.34 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.49 | 9.47 | 75.19 | 2.57 | 5.27 |

Total solids mass = 66.18 (gm) density = 2.65 (gm/cc)
G = -1042834.26 (J) H = -877108.32 (J) S = 142.48 (J/K) V = 24.97 (cc) Cp = 77.69 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1584919.00 (J) H = -1319739.32 (J) S = 227.98 (J/K) V = 38.84 (cc) Cp = 122.58 (J/K)

Oxygen delta moles = -0.00092787 delta grams = -0.0296907
G = 242.21 (J) H = -26.39 (J) S = -0.23 (J/K) V = -89.73 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 31.12 (gm) density = 2.43 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -499503.67 (J) H = -408416.31 (J) S = 78.99 (J/K) V = 12.82 (cc) Cp = 41.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.47 | 0.64 | 13.22 | 0.31 | 0.00 | 1.17 | 0.18 | 0.13 | 0.00 | 0.00 | 1.63 | 2.98 | 5.86 | 0.19 | 3.22 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.10 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.63Mg0.20)3Al2Si3O12
G = -81309.78 (J) H = -67465.37 (J) S = 12.01 (J/K) V = 1.54 (cc) Cp = 6.56 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.45 | 16.26 | 20.29 |

orthopyroxene mass = 0.90 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.14Mg0.75Fe'''0.03Ti0.00Al0.13Si1.92O6
G = -11339.34 (J) H = -9235.31 (J) S = 1.82 (J/K) V = 0.25 (cc) Cp = 1.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.11 | 96.56 | 113.63 | 4.91 | -4.69 | 7.30 | 0.40 |

feldspar mass = 36.78 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.56Na0.41Ca0.04Al1.04Si2.96O8
G = -583561.32 (J) H = -490173.63 (J) S = 80.98 (J/K) V = 14.44 (cc) Cp = 43.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.80 | 3.55 | 55.64 |

feldspar mass = 0.47 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.17Na0.68Ca0.15Al1.15Si2.85O8
G = -7545.19 (J) H = -6348.24 (J) S = 1.04 (J/K) V = 0.18 (cc) Cp = 0.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.57 | 15.29 | 17.14 |

quartz mass = 24.17 (gm) density = 2.56 (gm/cc)
SiO2
G = -395182.24 (J) H = -336639.22 (J) S = 50.77 (J/K) V = 9.44 (cc) Cp = 28.39 (J/K)

rhm-oxide mass = 0.43 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.18Al0.10Ti0.86O3
G = -4177.86 (J) H = -3243.23 (J) S = 0.81 (J/K) V = 0.09 (cc) Cp = 0.40 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.86 | 8.97 | 75.31 | 2.73 | 5.12 |

Total solids mass = 68.84 (gm) density = 2.65 (gm/cc)
G = -1083115.73 (J) H = -913105.00 (J) S = 147.43 (J/K) V = 25.94 (cc) Cp = 80.71 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1582619.40 (J) H = -1321521.31 (J) S = 226.42 (J/K) V = 38.76 (cc) Cp = 122.11 (J/K)

Oxygen delta moles = -0.000979913 delta grams = -0.031356
G = 253.36 (J) H = -27.52 (J) S = -0.24 (J/K) V = -93.95 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: akosite

T = 870.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.13 COH = 1.22 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 28.72 (gm) density = 2.42 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -461086.00 (J) H = -377491.18 (J) S = 73.13 (J/K) V = 11.87 (cc) Cp = 38.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.48 | 0.60 | 13.05 | 0.29 | 0.00 | 1.07 | 0.19 | 0.13 | 0.00 | 0.00 | 1.63 | 3.12 | 5.75 | 0.21 | 3.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.78 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.63Mg0.21)3Al2Si3O12
G = -90546.37 (J) H = -75340.58 (J) S = 13.30 (J/K) V = 1.71 (cc) Cp = 7.30 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.69 | 16.56 | 20.75 |

orthopyroxene mass = 0.53 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.11Mg0.78Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -6746.00 (J) H = -5515.82 (J) S = 1.08 (J/K) V = 0.15 (cc) Cp = 0.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.82 | 96.50 | 110.85 | 4.73 | -4.52 | 6.85 | 0.40 |

feldspar mass = 37.77 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.57Na0.40Ca0.03Al1.03Si2.97O8
G = -598126.65 (J) H = -503551.82 (J) S = 82.73 (J/K) V = 14.83 (cc) Cp = 44.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.00 | 3.28 | 56.72 |

feldspar mass = 0.73 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.68Ca0.15Al1.15Si2.85O8
G = -11793.35 (J) H = -9945.25 (J) S = 1.62 (J/K) V = 0.28 (cc) Cp = 0.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.26 | 15.29 | 16.45 |

quartz mass = 24.94 (gm) density = 2.56 (gm/cc)
SiO2
G = -407297.41 (J) H = -347697.71 (J) S = 52.14 (J/K) V = 9.74 (cc) Cp = 29.27 (J/K)

rhm-oxide mass = 0.49 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.17Al0.10Ti0.87O3
G = -4743.61 (J) H = -3696.98 (J) S = 0.92 (J/K) V = 0.11 (cc) Cp = 0.46 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.23 | 8.50 | 75.39 | 2.89 | 4.98 |

Total solids mass = 71.25 (gm) density = 2.66 (gm/cc)
G = -1119253.39 (J) H = -945748.17 (J) S = 151.78 (J/K) V = 26.82 (cc) Cp = 83.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1580339.39 (J) H = -1323239.35 (J) S = 224.90 (J/K) V = 38.68 (cc) Cp = 121.68 (J/K)

Oxygen delta moles = -0.00102408 delta grams = -0.0327695
G = 262.24 (J) H = -28.40 (J) S = -0.25 (J/K) V = -97.33 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 26.53 (gm) density = 2.41 (gm/cc) viscosity = 5.85 (log 10 poise) (analysis in wt %)
G = -426136.63 (J) H = -349301.80 (J) S = 67.81 (J/K) V = 11.00 (cc) Cp = 35.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.46 | 0.55 | 12.87 | 0.27 | 0.00 | 0.98 | 0.20 | 0.13 | 0.00 | 0.00 | 1.63 | 3.27 | 5.63 | 0.23 | 3.78 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.36 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.62Mg0.21)3Al2Si3O12
G = -98358.61 (J) H = -82068.50 (J) S = 14.38 (J/K) V = 1.86 (cc) Cp = 7.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.97 | 16.84 | 21.19 |

orthopyroxene mass = 0.23 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.81Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -2901.76 (J) H = -2381.75 (J) S = 0.46 (J/K) V = 0.06 (cc) Cp = 0.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.60 | 96.45 | 108.12 | 4.56 | -4.36 | 6.42 | 0.41 |

feldspar mass = 38.59 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.58Na0.39Ca0.03Al1.03Si2.97O8
G = -609782.53 (J) H = -514532.07 (J) S = 84.06 (J/K) V = 15.15 (cc) Cp = 45.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 39.21 | 3.02 | 57.76 |

feldspar mass = 1.07 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.16Na0.69Ca0.15Al1.15Si2.85O8
G = -17323.04 (J) H = -14641.80 (J) S = 2.37 (J/K) V = 0.41 (cc) Cp = 1.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.93 | 15.26 | 15.81 |

quartz mass = 25.65 (gm) density = 2.56 (gm/cc)
SiO2
G = -418349.70 (J) H = -357890.23 (J) S = 53.36 (J/K) V = 10.02 (cc) Cp = 30.07 (J/K)

rhm-oxide mass = 0.54 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.09Fe'"0.16Al0.10Ti0.87O3
G = -5225.48 (J) H = -4088.39 (J) S = 1.00 (J/K) V = 0.12 (cc) Cp = 0.50 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.60 | 8.06 | 75.44 | 3.04 | 4.85 |

Total solids mass = 73.43 (gm) density = 2.66 (gm/cc)
G = -1151941.13 (J) H = -975602.73 (J) S = 155.62 (J/K) V = 27.62 (cc) Cp = 85.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1578077.76 (J) H = -1324904.53 (J) S = 223.42 (J/K) V = 38.62 (cc) Cp = 121.29 (J/K)

Oxygen delta moles = -0.00106191 delta grams = -0.0339799
G = 269.29 (J) H = -29.07 (J) S = -0.26 (J/K) V = -100.05 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15
IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 24.53 (gm) density = 2.40 (gm/cc) viscosity = 5.72 (log 10 poise) (analysis in wt %)
G = -394177.24 (J) H = -323472.51 (J) S = 62.95 (J/K) V = 10.20 (cc) Cp = 32.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.39 | 0.51 | 12.72 | 0.25 | 0.00 | 0.90 | 0.21 | 0.13 | 0.00 | 0.00 | 1.63 | 3.42 | 5.51 | 0.25 | 4.09 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.81 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.61Mg0.22)3Al2Si3O12
G = -104482.59 (J) H = -87415.93 (J) S = 15.20 (J/K) V = 1.97 (cc) Cp = 8.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.33 | 17.11 | 21.56 |

feldspar mass = 39.21 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.59Na0.38Ca0.03Al1.03Si2.97O8
G = -618420.58 (J) H = -523006.26 (J) S = 84.95 (J/K) V = 15.40 (cc) Cp = 46.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.41 | 2.79 | 58.81 |

feldspar mass = 1.53 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.15Na0.70Ca0.15Al1.15Si2.85O8
G = -24730.82 (J) H = -20950.65 (J) S = 3.37 (J/K) V = 0.59 (cc) Cp = 1.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.59 | 15.24 | 15.18 |

quartz mass = 26.30 (gm) density = 2.56 (gm/cc)
SiO2
G = -428387.52 (J) H = -367252.42 (J) S = 54.43 (J/K) V = 10.27 (cc) Cp = 30.80 (J/K)

rhm-oxide mass = 0.58 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.09Fe'"0.15Al0.09Ti0.88O3
G = -5635.07 (J) H = -4425.64 (J) S = 1.08 (J/K) V = 0.12 (cc) Cp = 0.54 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.93 | 7.65 | 75.50 | 3.18 | 4.73 |

Total solids mass = 75.43 (gm) density = 2.66 (gm/cc)
G = -1181656.58 (J) H = -1003050.90 (J) S = 159.02 (J/K) V = 28.36 (cc) Cp = 88.14 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1575833.82 (J) H = -1326523.40 (J) S = 221.97 (J/K) V = 38.56 (cc) Cp = 120.93 (J/K)

Oxygen delta moles = -0.00109402 delta grams = -0.0350074
G = 274.72 (J) H = -29.56 (J) S = -0.27 (J/K) V = -102.16 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 22.72 (gm) density = 2.40 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -365209.44 (J) H = -300038.89 (J) S = 58.55 (J/K) V = 9.48 (cc) Cp = 30.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.23 | 0.47 | 12.65 | 0.24 | 0.00 | 0.82 | 0.22 | 0.13 | 0.00 | 0.00 | 1.63 | 3.52 | 5.41 | 0.26 | 4.41 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.93 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.61Mg0.21)3Al2Si3O12
G = -105900.74 (J) H = -88825.90 (J) S = 15.34 (J/K) V = 2.00 (cc) Cp = 8.52 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.15 | 17.46 | 21.39 |

feldspar mass = 39.41 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.60Na0.37Ca0.03Al1.03Si2.97O8
G = -620408.67 (J) H = -525880.80 (J) S = 84.92 (J/K) V = 15.48 (cc) Cp = 46.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.40 | 2.57 | 60.04 |

feldspar mass = 2.44 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.70Ca0.15Al1.15Si2.85O8
G = -39388.44 (J) H = -33444.46 (J) S = 5.34 (J/K) V = 0.94 (cc) Cp = 2.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.15 | 15.40 | 14.45 |

quartz mass = 26.85 (gm) density = 2.56 (gm/cc)
SiO2
G = -436729.89 (J) H = -375193.65 (J) S = 55.28 (J/K) V = 10.48 (cc) Cp = 31.41 (J/K)

rhm-oxide mass = 0.61 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.09Fe'"0.15Al0.09Ti0.88O3
G = -5971.06 (J) H = -4706.13 (J) S = 1.14 (J/K) V = 0.13 (cc) Cp = 0.57 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.98 | 7.29 | 75.77 | 3.30 | 4.67 |

Total solids mass = 77.24 (gm) density = 2.66 (gm/cc)
G = -1208398.80 (J) H = -1028050.94 (J) S = 162.02 (J/K) V = 29.04 (cc) Cp = 90.19 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1573608.24 (J) H = -1328089.83 (J) S = 220.56 (J/K) V = 38.52 (cc) Cp = 120.62 (J/K)

Oxygen delta moles = -0.00111848 delta grams = -0.0357902
G = 278.10 (J) H = -29.83 (J) S = -0.28 (J/K) V = -103.52 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 830.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.17 COH = 1.09 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 21.03 (gm) density = 2.39 (gm/cc) viscosity = 5.46 (log 10 poise) (analysis in wt %)
G = -338160.99 (J) H = -278097.85 (J) S = 54.45 (J/K) V = 8.80 (cc) Cp = 28.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.03 | 0.43 | 12.58 | 0.22 | 0.00 | 0.76 | 0.24 | 0.12 | 0.00 | 0.00 | 1.62 | 3.64 | 5.29 | 0.29 | 4.77 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.03 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -107133.42 (J) H = -90085.22 (J) S = 15.45 (J/K) V = 2.03 (cc) Cp = 8.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.98 | 17.78 | 21.24 |

feldspar mass = 39.61 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.02Al1.02Si2.98O8
G = -622332.18 (J) H = -528708.82 (J) S = 84.87 (J/K) V = 15.56 (cc) Cp = 46.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.43 | 2.37 | 61.20 |

feldspar mass = 3.28 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.71Ca0.16Al1.16Si2.84O8
G = -52893.27 (J) H = -45013.92 (J) S = 7.14 (J/K) V = 1.26 (cc) Cp = 3.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.69 | 15.52 | 13.79 |

quartz mass = 27.37 (gm) density = 2.56 (gm/cc)
SiO2
G = -444616.56 (J) H = -382771.96 (J) S = 56.06 (J/K) V = 10.69 (cc) Cp = 31.98 (J/K)

rhm-oxide mass = 0.65 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.09Fe'"0.14Al0.09Ti0.88O3
G = -6261.39 (J) H = -4952.26 (J) S = 1.19 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.03 | 6.94 | 76.03 | 3.40 | 4.60 |

Total solids mass = 78.93 (gm) density = 2.66 (gm/cc)
G = -1233236.82 (J) H = -1051532.18 (J) S = 164.71 (J/K) V = 29.68 (cc) Cp = 92.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1571397.81 (J) H = -1329630.03 (J) S = 219.16 (J/K) V = 38.48 (cc) Cp = 120.33 (J/K)

Oxygen delta moles = -0.00114089 delta grams = -0.0365071
G = 280.85 (J) H = -30.02 (J) S = -0.28 (J/K) V = -104.64 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 19.44 (gm) density = 2.38 (gm/cc) viscosity = 5.31 (log 10 poise) (analysis in wt %)
G = -312742.14 (J) H = -257418.03 (J) S = 50.61 (J/K) V = 8.16 (cc) Cp = 26.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.78 | 0.40 | 12.52 | 0.21 | 0.00 | 0.70 | 0.25 | 0.12 | 0.00 | 0.00 | 1.62 | 3.78 | 5.16 | 0.31 | 5.16 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.12 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -108205.88 (J) H = -91213.93 (J) S = 15.54 (J/K) V = 2.05 (cc) Cp = 8.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.82 | 18.07 | 21.12 |

feldspar mass = 39.81 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.62Na0.36Ca0.02Al1.02Si2.98O8
G = -624122.61 (J) H = -531431.45 (J) S = 84.79 (J/K) V = 15.63 (cc) Cp = 47.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.50 | 2.18 | 62.31 |

feldspar mass = 4.07 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.71Ca0.16Al1.16Si2.84O8
G = -65489.39 (J) H = -55860.28 (J) S = 8.81 (J/K) V = 1.56 (cc) Cp = 4.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.23 | 15.60 | 13.17 |

quartz mass = 27.86 (gm) density = 2.56 (gm/cc)
SiO2
G = -452130.25 (J) H = -390056.15 (J) S = 56.78 (J/K) V = 10.88 (cc) Cp = 32.53 (J/K)

rhm-oxide mass = 0.67 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.09Fe'"0.13Al0.09Ti0.89O3
G = -6512.07 (J) H = -5168.43 (J) S = 1.23 (J/K) V = 0.14 (cc) Cp = 0.62 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.09 | 6.60 | 76.27 | 3.50 | 4.54 |

Total solids mass = 80.52 (gm) density = 2.66 (gm/cc)
G = -1256460.20 (J) H = -1073730.23 (J) S = 167.16 (J/K) V = 30.27 (cc) Cp = 93.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1569202.34 (J) H = -1331148.26 (J) S = 217.77 (J/K) V = 38.44 (cc) Cp = 120.06 (J/K)

Oxygen delta moles = -0.00116146 delta grams = -0.0371654
G = 283.05 (J) H = -30.16 (J) S = -0.29 (J/K) V = -105.56 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 17.93 (gm) density = 2.37 (gm/cc) viscosity = 5.14 (log 10 poise) (analysis in wt %)
G = -288687.47 (J) H = -237786.18 (J) S = 46.99 (J/K) V = 7.56 (cc) Cp = 24.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.47 | 0.36 | 12.45 | 0.19 | 0.00 | 0.65 | 0.27 | 0.11 | 0.00 | 0.00 | 1.62 | 3.92 | 5.02 | 0.34 | 5.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.19 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -109139.08 (J) H = -92228.61 (J) S = 15.61 (J/K) V = 2.07 (cc) Cp = 8.78 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.66 | 18.33 | 21.01 |

feldspar mass = 39.99 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -625753.79 (J) H = -534025.48 (J) S = 84.69 (J/K) V = 15.70 (cc) Cp = 47.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.61 | 2.01 | 63.38 |

feldspar mass = 4.81 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.72Ca0.16Al1.16Si2.84O8
G = -77363.11 (J) H = -66137.43 (J) S = 10.36 (J/K) V = 1.85 (cc) Cp = 5.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.77 | 15.64 | 12.59 |

quartz mass = 28.34 (gm) density = 2.56 (gm/cc)
SiO2
G = -459349.96 (J) H = -397112.40 (J) S = 57.46 (J/K) V = 11.07 (cc) Cp = 33.05 (J/K)

rhm-oxide mass = 0.69 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.09Fe'"0.13Al0.09Ti0.89O3
G = -6728.22 (J) H = -5358.37 (J) S = 1.26 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.14 | 6.29 | 76.50 | 3.59 | 4.48 |

Total solids mass = 82.03 (gm) density = 2.66 (gm/cc)
G = -1278334.16 (J) H = -1094862.28 (J) S = 169.39 (J/K) V = 30.84 (cc) Cp = 95.61 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1567021.63 (J) H = -1332648.46 (J) S = 216.38 (J/K) V = 38.40 (cc) Cp = 119.80 (J/K)

Oxygen delta moles = -0.0011804 delta grams = -0.0377715
G = 284.75 (J) H = -30.23 (J) S = -0.29 (J/K) V = -106.30 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 800.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.20 COH = 0.99 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 16.50 (gm) density = 2.36 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -265744.23 (J) H = -218997.51 (J) S = 43.56 (J/K) V = 6.98 (cc) Cp = 22.33 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.08 | 0.32 | 12.39 | 0.18 | 0.00 | 0.60 | 0.29 | 0.11 | 0.00 | 0.00 | 1.62 | 4.09 | 4.86 | 0.36 | 6.08 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.26 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.61Mg0.21)3Al2Si3O12
G = -109950.29 (J) H = -93142.96 (J) S = 15.66 (J/K) V = 2.09 (cc) Cp = 8.84 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.52 | 18.57 | 20.91 |

feldspar mass = 40.16 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -627226.89 (J) H = -536490.91 (J) S = 84.55 (J/K) V = 15.77 (cc) Cp = 47.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.73 | 1.85 | 64.41 |

feldspar mass = 5.52 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.16Al1.16Si2.84O8
G = -88664.99 (J) H = -75970.08 (J) S = 11.83 (J/K) V = 2.12 (cc) Cp = 6.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.30 | 15.66 | 12.04 |

quartz mass = 28.81 (gm) density = 2.56 (gm/cc)
SiO2
G = -466354.94 (J) H = -404007.69 (J) S = 58.10 (J/K) V = 11.25 (cc) Cp = 33.56 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.09Fe'"0.12Al0.09Ti0.90O3
G = -6914.24 (J) H = -5525.32 (J) S = 1.29 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.20 | 5.98 | 76.73 | 3.67 | 4.42 |

Total solids mass = 83.46 (gm) density = 2.66 (gm/cc)
G = -1299111.34 (J) H = -1115136.97 (J) S = 171.43 (J/K) V = 31.38 (cc) Cp = 97.24 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1564855.57 (J) H = -1334134.48 (J) S = 214.99 (J/K) V = 38.36 (cc) Cp = 119.57 (J/K)

Oxygen delta moles = -0.0011979 delta grams = -0.0383312
G = 286.02 (J) H = -30.26 (J) S = -0.29 (J/K) V = -106.88 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 15.11 (gm) density = 2.35 (gm/cc) viscosity = 4.73 (log 10 poise) (analysis in wt %)
G = -243658.42 (J) H = -200844.20 (J) S = 40.27 (J/K) V = 6.42 (cc) Cp = 20.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.60 | 0.29 | 12.33 | 0.17 | 0.00 | 0.56 | 0.31 | 0.10 | 0.00 | 0.00 | 1.63 | 4.28 | 4.68 | 0.40 | 6.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.33 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -110653.63 (J) H = -93968.16 (J) S = 15.69 (J/K) V = 2.10 (cc) Cp = 8.90 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.38 | 18.79 | 20.83 |

feldspar mass = 40.32 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -628562.81 (J) H = -538844.71 (J) S = 84.39 (J/K) V = 15.83 (cc) Cp = 47.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.88 | 1.71 | 65.42 |

feldspar mass = 6.20 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.16Al1.16Si2.84O8
G = -99525.51 (J) H = -85466.96 (J) S = 13.22 (J/K) V = 2.38 (cc) Cp = 7.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.82 | 15.65 | 11.52 |

quartz mass = 29.27 (gm) density = 2.56 (gm/cc)
SiO2
G = -473229.75 (J) H = -410814.19 (J) S = 58.71 (J/K) V = 11.43 (cc) Cp = 34.06 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.09Fe'"0.11Al0.09Ti0.90O3
G = -7073.94 (J) H = -5672.10 (J) S = 1.32 (J/K) V = 0.16 (cc) Cp = 0.67 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.26 | 5.69 | 76.94 | 3.74 | 4.37 |

Total solids mass = 84.85 (gm) density = 2.66 (gm/cc)
G = -1319045.64 (J) H = -1134766.11 (J) S = 173.33 (J/K) V = 31.91 (cc) Cp = 98.82 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1562704.07 (J) H = -1335610.31 (J) S = 213.60 (J/K) V = 38.33 (cc) Cp = 119.36 (J/K)

Oxygen delta moles = -0.00121411 delta grams = -0.0388501
G = 286.91 (J) H = -30.24 (J) S = -0.30 (J/K) V = -107.32 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 780.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.23 COH = 0.92 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 13.77 (gm) density = 2.34 (gm/cc) viscosity = 4.48 (log 10 poise) (analysis in wt %)
G = -222155.92 (J) H = -183099.31 (J) S = 37.09 (J/K) V = 5.88 (cc) Cp = 18.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.99 | 0.25 | 12.27 | 0.17 | 0.00 | 0.52 | 0.34 | 0.10 | 0.00 | 0.00 | 1.65 | 4.51 | 4.48 | 0.44 | 7.28 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.38 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -111260.29 (J) H = -94712.98 (J) S = 15.71 (J/K) V = 2.12 (cc) Cp = 8.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.25 | 18.98 | 20.77 |

feldspar mass = 40.47 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -629799.42 (J) H = -541118.61 (J) S = 84.21 (J/K) V = 15.89 (cc) Cp = 47.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.04 | 1.57 | 66.40 |

feldspar mass = 6.86 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.73Ca0.16Al1.16Si2.84O8
G = -110069.04 (J) H = -94732.55 (J) S = 14.56 (J/K) V = 2.63 (cc) Cp = 8.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.34 | 15.63 | 11.03 |

quartz mass = 29.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -480071.76 (J) H = -417615.78 (J) S = 59.30 (J/K) V = 11.61 (cc) Cp = 34.55 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.09Fe'"0.11Al0.09Ti0.90O3
G = -7210.67 (J) H = -5801.17 (J) S = 1.34 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.32 | 5.40 | 77.16 | 3.79 | 4.33 |

Total solids mass = 86.19 (gm) density = 2.66 (gm/cc)
G = -1338411.17 (J) H = -1153981.09 (J) S = 175.12 (J/K) V = 32.42 (cc) Cp = 100.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1560567.09 (J) H = -1337080.40 (J) S = 212.21 (J/K) V = 38.29 (cc) Cp = 119.18 (J/K)

Oxygen delta moles = -0.00122921 delta grams = -0.0393333
G = 287.46 (J) H = -30.19 (J) S = -0.30 (J/K) V = -107.63 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 770.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.24 COH = 0.88 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 12.43 (gm) density = 2.33 (gm/cc) viscosity = 4.19 (log 10 poise) (analysis in wt %)
G = -200912.55 (J) H = -165491.36 (J) S = 33.96 (J/K) V = 5.34 (cc) Cp = 17.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.21 | 0.22 | 12.21 | 0.16 | 0.00 | 0.49 | 0.37 | 0.09 | 0.00 | 0.00 | 1.67 | 4.78 | 4.25 | 0.48 | 8.06 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.43 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -111778.54 (J) H = -95383.81 (J) S = 15.72 (J/K) V = 2.13 (cc) Cp = 8.99 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.14 | 19.14 | 20.71 |

feldspar mass = 40.62 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.01Al1.01Si2.99O8
G = -630992.46 (J) H = -543360.09 (J) S = 84.01 (J/K) V = 15.95 (cc) Cp = 48.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.20 | 1.44 | 67.36 |

feldspar mass = 7.52 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.74Ca0.16Al1.16Si2.84O8
G = -120430.47 (J) H = -103881.46 (J) S = 15.86 (J/K) V = 2.88 (cc) Cp = 9.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.85 | 15.60 | 10.55 |

quartz mass = 30.20 (gm) density = 2.56 (gm/cc)
SiO2
G = -487003.25 (J) H = -424518.78 (J) S = 59.90 (J/K) V = 11.79 (cc) Cp = 35.05 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.09Fe'"0.10Al0.09Ti0.91O3
G = -7327.37 (J) H = -5914.76 (J) S = 1.35 (J/K) V = 0.16 (cc) Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.37 | 5.13 | 77.38 | 3.82 | 4.29 |

Total solids mass = 87.53 (gm) density = 2.66 (gm/cc)
G = -1357532.10 (J) H = -1173058.90 (J) S = 176.84 (J/K) V = 32.92 (cc) Cp = 101.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1558444.65 (J) H = -1338550.27 (J) S = 210.80 (J/K) V = 38.26 (cc) Cp = 119.03 (J/K)

Oxygen delta moles = -0.00124335 delta grams = -0.0397858
G = 287.72 (J) H = -30.10 (J) S = -0.30 (J/K) V = -107.84 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 760.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.25 COH = 0.84 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 11.11 (gm) density = 2.31 (gm/cc) viscosity = 3.84 (log 10 poise) (analysis in wt %)
G = -179912.54 (J) H = -148011.62 (J) S = 30.88 (J/K) V = 4.81 (cc) Cp = 15.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.20 | 0.19 | 12.15 | 0.16 | 0.00 | 0.47 | 0.41 | 0.09 | 0.00 | 0.00 | 1.70 | 5.10 | 3.97 | 0.54 | 9.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.47 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -112209.58 (J) H = -95980.86 (J) S = 15.71 (J/K) V = 2.14 (cc) Cp = 9.02 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.05 | 19.28 | 20.67 |

feldspar mass = 40.77 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -632083.31 (J) H = -545518.26 (J) S = 83.79 (J/K) V = 16.00 (cc) Cp = 48.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.37 | 1.32 | 68.30 |

feldspar mass = 8.17 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -130765.97 (J) H = -113047.71 (J) S = 17.15 (J/K) V = 3.13 (cc) Cp = 10.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.35 | 15.55 | 10.10 |

quartz mass = 30.67 (gm) density = 2.60 (gm/cc)
SiO2
G = -493938.14 (J) H = -432250.31 (J) S = 59.71 (J/K) V = 11.79 (cc) Cp = 41.32 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.78Mg0.09Fe'"0.10Al0.09Ti0.91O3
G = -7424.14 (J) H = -6012.76 (J) S = 1.37 (J/K) V = 0.17 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.43 | 4.87 | 77.62 | 3.84 | 4.25 |

Total solids mass = 88.85 (gm) density = 2.67 (gm/cc)
G = -1376421.14 (J) H = -1192809.90 (J) S = 177.72 (J/K) V = 33.24 (cc) Cp = 109.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1556333.68 (J) H = -1340821.52 (J) S = 208.60 (J/K) V = 38.04 (cc) Cp = 124.68 (J/K)

Oxygen delta moles = -0.00125673 delta grams = -0.0402138
G = 287.73 (J) H = -29.98 (J) S = -0.31 (J/K) V = -107.95 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 9.65 (gm) density = 2.29 (gm/cc) viscosity = 3.37 (log 10 poise) (analysis in wt %)
G = -156647.72 (J) H = -128512.25 (J) S = 27.50 (J/K) V = 4.22 (cc) Cp = 13.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.60 | 0.15 | 12.11 | 0.15 | 0.00 | 0.45 | 0.48 | 0.08 | 0.00 | 0.00 | 1.76 | 5.57 | 3.62 | 0.62 | 10.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.51 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -112566.93 (J) H = -96515.47 (J) S = 15.69 (J/K) V = 2.15 (cc) Cp = 9.05 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.97 | 19.38 | 20.65 |

feldspar mass = 40.95 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -633796.50 (J) H = -548220.06 (J) S = 83.64 (J/K) V = 16.07 (cc) Cp = 48.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.52 | 1.22 | 69.26 |

feldspar mass = 8.85 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.75Ca0.16Al1.16Si2.84O8
G = -141434.96 (J) H = -122543.38 (J) S = 18.46 (J/K) V = 3.39 (cc) Cp = 10.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.82 | 15.54 | 9.64 |

quartz mass = 31.22 (gm) density = 2.60 (gm/cc)
SiO2
G = -502288.00 (J) H = -440506.42 (J) S = 60.38 (J/K) V = 11.99 (cc) Cp = 41.71 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.78Mg0.09Fe'"0.09Al0.08Ti0.91O3
G = -7514.65 (J) H = -6106.27 (J) S = 1.38 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.48 | 4.61 | 77.87 | 3.81 | 4.24 |

Total solids mass = 90.31 (gm) density = 2.67 (gm/cc)
G = -1397601.05 (J) H = -1213891.59 (J) S = 179.55 (J/K) V = 33.77 (cc) Cp = 110.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1554248.76 (J) H = -1342403.84 (J) S = 207.05 (J/K) V = 37.99 (cc) Cp = 124.41 (J/K)

Oxygen delta moles = -0.00126946 delta grams = -0.0406211
G = 287.55 (J) H = -29.84 (J) S = -0.31 (J/K) V = -107.99 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 740.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.28 COH = 0.76 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 8.07 (gm) density = 2.26 (gm/cc) viscosity = 2.73 (log 10 poise) (analysis in wt %)
G = -131598.92 (J) H = -107406.52 (J) S = 23.88 (J/K) V = 3.58 (cc) Cp = 11.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.14 | 0.11 | 12.07 | 0.16 | 0.00 | 0.45 | 0.57 | 0.08 | 0.00 | 0.00 | 1.86 | 6.23 | 3.16 | 0.75 | 12.42 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.54 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -112820.93 (J) H = -96960.52 (J) S = 15.65 (J/K) V = 2.16 (cc) Cp = 9.07 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.93 | 19.43 | 20.64 |

feldspar mass = 41.15 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -635708.44 (J) H = -551101.72 (J) S = 83.51 (J/K) V = 16.15 (cc) Cp = 48.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.66 | 1.12 | 70.23 |

feldspar mass = 9.58 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.75Ca0.16Al1.16Si2.84O8
G = -152937.72 (J) H = -132804.93 (J) S = 19.87 (J/K) V = 3.67 (cc) Cp = 11.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.25 | 15.55 | 9.20 |

quartz mass = 31.84 (gm) density = 2.61 (gm/cc)
SiO2
G = -511523.35 (J) H = -449567.39 (J) S = 61.15 (J/K) V = 12.21 (cc) Cp = 42.17 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.78Mg0.10Fe'"0.09Al0.08Ti0.91O3
G = -7590.32 (J) H = -6188.21 (J) S = 1.38 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.52 | 4.34 | 78.16 | 3.73 | 4.25 |

Total solids mass = 91.89 (gm) density = 2.68 (gm/cc)
G = -1420580.75 (J) H = -1236622.77 (J) S = 181.57 (J/K) V = 34.35 (cc) Cp = 112.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.64 (gm/cc)
G = -1552179.67 (J) H = -1344029.29 (J) S = 205.45 (J/K) V = 37.93 (cc) Cp = 124.22 (J/K)

Oxygen delta moles = -0.00128199 delta grams = -0.0410222
G = 287.25 (J) H = -29.69 (J) S = -0.31 (J/K) V = -107.99 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: akosite

T = 730.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.29 COH = 0.72 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 6.41 (gm) density = 2.20 (gm/cc) viscosity = 1.89 (log 10 poise) (analysis in wt %)
G = -105372.52 (J) H = -85222.20 (J) S = 20.09 (J/K) V = 2.91 (cc) Cp = 9.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.18 | 0.08 | 11.97 | 0.16 | 0.00 | 0.46 | 0.72 | 0.07 | 0.00 | 0.00 | 2.03 | 7.19 | 2.57 | 0.94 | 15.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.56 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -112946.13 (J) H = -97292.45 (J) S = 15.60 (J/K) V = 2.16 (cc) Cp = 9.08 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.95 | 19.39 | 20.66 |

feldspar mass = 41.31 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -637027.54 (J) H = -553476.66 (J) S = 83.29 (J/K) V = 16.21 (cc) Cp = 49.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.79 | 1.02 | 71.18 |

feldspar mass = 10.40 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.76Ca0.16Al1.16Si2.84O8
G = -165828.78 (J) H = -144320.15 (J) S = 21.44 (J/K) V = 3.98 (cc) Cp = 13.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.67 | 15.56 | 8.77 |

quartz mass = 32.48 (gm) density = 2.61 (gm/cc)
SiO2
G = -521307.10 (J) H = -459141.13 (J) S = 61.97 (J/K) V = 12.44 (cc) Cp = 42.67 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.79Mg0.10Fe'"0.08Al0.09Ti0.92O3
G = -7644.84 (J) H = -6253.31 (J) S = 1.39 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.55 | 4.08 | 78.53 | 3.57 | 4.27 |

Total solids mass = 93.54 (gm) density = 2.68 (gm/cc)
G = -1444754.39 (J) H = -1260483.71 (J) S = 183.69 (J/K) V = 34.96 (cc) Cp = 114.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.64 (gm/cc)
G = -1550126.91 (J) H = -1345705.91 (J) S = 203.78 (J/K) V = 37.87 (cc) Cp = 124.14 (J/K)

Oxygen delta moles = -0.00129466 delta grams = -0.0414275
G = 286.93 (J) H = -29.53 (J) S = -0.32 (J/K) V = -107.98 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 3.93 (log 10 poise)  (analysis in wt %)
G = -1695782.23 (J)  H = -1251620.49 (J)  S = 282.34 (J/K)  V = 41.08 (cc)  Cp = 143.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.85 | 0.00 | 4.05 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.93 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1695782.23 (J)  H = -1251620.49 (J)  S = 282.34 (J/K)  V = 41.08 (cc)  Cp = 143.19 (J/K)

Oxygen  delta moles = 1.35308e-16  delta grams = 4.32971e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 3.98 (log 10 poise)  (analysis in wt %)
G = -1692965.30 (J)  H = -1253053.99 (J)  S = 281.43 (J/K)  V = 41.05 (cc)  Cp = 143.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.85 | 0.00 | 4.05 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.98 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1692965.30 (J)  H = -1253053.99 (J)  S = 281.43 (J/K)  V = 41.05 (cc)  Cp = 143.19 (J/K)

Oxygen  delta moles = 3.49348e-06  delta grams = 0.000111787
G = -1.27 (J)  H = 0.15 (J)  S = 0.00 (J/K)  V = 0.45 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.04 (log 10 poise)  (analysis in wt %)
G = -1690157.73 (J)  H = -1254487.59 (J)  S = 280.51 (J/K)  V = 41.02 (cc)  Cp = 143.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.86 | 0.00 | 4.05 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.04 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1690157.73 (J)  H = -1254487.59 (J)  S = 280.51 (J/K)  V = 41.02 (cc)  Cp = 143.18 (J/K)

Oxygen  delta moles = 7.34773e-06  delta grams = 0.000235119
G = -2.65 (J)  H = 0.31 (J)  S = 0.00 (J/K)  V = 0.95 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.10 (log 10 poise)  (analysis in wt %)
G = -1687359.57 (J)  H = -1255921.31 (J)  S = 279.58 (J/K)  V = 40.99 (cc)  Cp = 143.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.86 | 0.00 | 4.05 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.10 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1687359.57 (J)  H = -1255921.31 (J)  S = 279.58 (J/K)  V = 40.99 (cc)  Cp = 143.17 (J/K)

Oxygen  delta moles = 1.1573e-05  delta grams = 0.000370321
G = -4.14 (J)  H = 0.49 (J)  S = 0.00 (J/K)  V = 1.48 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.16 (log 10 poise)  (analysis in wt %)
G = -1684570.89 (J)  H = -1257355.15 (J)  S = 278.65 (J/K)  V = 40.96 (cc)  Cp = 143.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.86 | 0.00 | 4.04 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.16 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1684570.89 (J)  H = -1257355.15 (J)  S = 278.65 (J/K)  V = 40.96 (cc)  Cp = 143.17 (J/K)

Oxygen  delta moles = 1.61799e-05  delta grams = 0.000517736
G = -5.74 (J)  H = 0.68 (J)  S = 0.00 (J/K)  V = 2.06 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.22 (log 10 poise)  (analysis in wt %)
G = -1681791.76 (J)  H = -1258789.11 (J)  S = 277.72 (J/K)  V = 40.93 (cc)  Cp = 143.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.86 | 0.00 | 4.04 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.22 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1681791.76 (J)  H = -1258789.11 (J)  S = 277.72 (J/K)  V = 40.93 (cc)  Cp = 143.16 (J/K)

Oxygen  delta moles = 2.11795e-05  delta grams = 0.000677718
G = -7.46 (J)  H = 0.88 (J)  S = 0.01 (J/K)  V = 2.68 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.28 (log 10 poise) (analysis in wt %)
G = -1679022.24 (J) H = -1260223.21 (J) S = 276.77 (J/K) V = 40.90 (cc) Cp = 143.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.86 | 0.00 | 4.04 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.28 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1679022.24 (J) H = -1260223.21 (J) S = 276.77 (J/K) V = 40.90 (cc) Cp = 143.16 (J/K)

Oxygen delta moles = 2.65834e-05 delta grams = 0.000850638
G = -9.30 (J) H = 1.09 (J) S = 0.01 (J/K) V = 3.34 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.34 (log 10 poise) (analysis in wt %)
G = -1676262.41 (J) H = -1261657.45 (J) S = 275.82 (J/K) V = 40.87 (cc) Cp = 143.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.86 | 0.00 | 4.04 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.34 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1676262.41 (J) H = -1261657.45 (J) S = 275.82 (J/K) V = 40.87 (cc) Cp = 143.15 (J/K)

Oxygen delta moles = 3.24038e-05 delta grams = 0.00103688
G = -11.25 (J) H = 1.32 (J) S = 0.01 (J/K) V = 4.05 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1220.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.37 COH = 2.39 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -1673512.32 (J) H = -1263091.84 (J) S = 274.87 (J/K) V = 40.85 (cc) Cp = 143.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.87 | 0.00 | 4.04 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.40 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1673512.32 (J) H = -1263091.84 (J) S = 274.87 (J/K) V = 40.85 (cc) Cp = 143.14 (J/K)

Oxygen delta moles = 3.86531e-05 delta grams = 0.00123685
G = -13.32 (J) H = 1.56 (J) S = 0.01 (J/K) V = 4.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1210.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.37 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.46 (log 10 poise) (analysis in wt %)
G = -1670772.05 (J) H = -1264526.40 (J) S = 273.91 (J/K) V = 40.82 (cc) Cp = 143.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.87 | 0.00 | 4.04 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.46 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1670772.05 (J) H = -1264526.40 (J) S = 273.91 (J/K) V = 40.82 (cc) Cp = 143.14 (J/K)

Oxygen delta moles = 4.53445e-05 delta grams = 0.00145097
G = -15.51 (J) H = 1.81 (J) S = 0.01 (J/K) V = 5.59 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1200.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.35 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.52 (log 10 poise) (analysis in wt %)
G = -1668041.55 (J) H = -1265910.09 (J) S = 272.97 (J/K) V = 40.79 (cc) Cp = 135.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.87 | 0.00 | 4.03 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1668041.55 (J) H = -1265910.09 (J) S = 272.97 (J/K) V = 40.79 (cc) Cp = 135.68 (J/K)

Oxygen delta moles = 5.24917e-05 delta grams = 0.00167967
G = -17.82 (J) H = 2.08 (J) S = 0.01 (J/K) V = 6.43 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1190.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.34 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.59 (log 10 poise) (analysis in wt %)
G = -1665320.54 (J) H = -1267270.35 (J) S = 272.05 (J/K) V = 40.76 (cc) Cp = 135.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.87 | 0.00 | 4.03 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.59 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1665320.54 (J) H = -1267270.35 (J) S = 272.05 (J/K) V = 40.76 (cc) Cp = 135.65 (J/K)

Oxygen delta moles = 6.01092e-05 delta grams = 0.00192342
G = -20.26 (J) H = 2.36 (J) S = 0.02 (J/K) V = 7.31 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.65 (log 10 poise) (analysis in wt %)
G = -1662609.05 (J) H = -1268630.61 (J) S = 271.12 (J/K) V = 40.73 (cc) Cp = 135.63 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.68 0.50 13.96 0.88 0.00 4.03 0.10 1.91 0.00 0.00 2.71 3.72 2.41 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.65 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1662609.05 (J) H = -1268630.61 (J) S = 271.12 (J/K) V = 40.73 (cc) Cp = 135.63 (J/K)

Oxygen delta moles = 6.82117e-05 delta grams = 0.00218269
G = -22.81 (J) H = 2.65 (J) S = 0.02 (J/K) V = 8.24 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1170.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.35 COH = 2.30 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.72 (log 10 poise) (analysis in wt %)
G = -1659907.15 (J) H = -1269990.86 (J) S = 270.18 (J/K) V = 40.70 (cc) Cp = 135.60 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.68 0.50 13.96 0.88 0.00 4.03 0.10 1.91 0.00 0.00 2.71 3.72 2.41 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.72 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1659907.15 (J) H = -1269990.86 (J) S = 270.18 (J/K) V = 40.70 (cc) Cp = 135.60 (J/K)

Oxygen delta moles = 7.68149e-05 delta grams = 0.00245799
G = -25.49 (J) H = 2.96 (J) S = 0.02 (J/K) V = 9.22 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1160.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.35 COH = 2.29 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.79 (log 10 poise) (analysis in wt %)
G = -1657214.92 (J) H = -1271351.10 (J) S = 269.24 (J/K) V = 40.67 (cc) Cp = 135.58 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

68.68 0.50 13.96 0.88 0.00 4.02 0.10 1.91 0.00 0.00 2.71 3.72 2.41 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.79 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1657214.92 (J) H = -1271351.10 (J) S = 269.24 (J/K) V = 40.67 (cc) Cp = 135.58 (J/K)

Oxygen delta moles = 8.59353e-05 delta grams = 0.00274983
G = -28.30 (J) H = 3.28 (J) S = 0.02 (J/K) V = 10.24 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1150.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.34 COH = 2.27 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 99.52 (gm) density = 2.46 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1647165.53 (J) H = -1267146.47 (J) S = 267.03 (J/K) V = 40.48 (cc) Cp = 134.80 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.75 0.50 14.02 0.87 0.00 3.97 0.10 1.79 0.00 0.00 2.72 3.73 2.42 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.48 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.52Mg1.40Fe'"0.02Ti0.00Al0.09Si1.95O6
G = -7350.15 (J) H = -5735.40 (J) S = 1.13 (J/K) V = 0.14 (cc) Cp = 0.59 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-54.08 96.85 51.53 3.21 -3.01 5.26 0.24

Total solids mass = 0.48 (gm) density = 3.32 (gm/cc)
G = -7350.15 (J) H = -5735.40 (J) S = 1.13 (J/K) V = 0.14 (cc) Cp = 0.59 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1654515.68 (J) H = -1272881.87 (J) S = 268.16 (J/K) V = 40.62 (cc) Cp = 135.39 (J/K)

Oxygen delta moles = 6.40387e-05 delta grams = 0.00204916
G = -20.92 (J) H = 2.42 (J) S = 0.02 (J/K) V = 7.58 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1140.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.34 COH = 2.25 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 98.99 (gm) density = 2.46 (gm/cc) viscosity = 4.98 (log 10 poise) (analysis in wt %)
G = -1636429.16 (J) H = -1262394.03 (J) S = 264.68 (J/K) V = 40.27 (cc) Cp = 133.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.84 | 0.51 | 14.08 | 0.87 | 0.00 | 3.90 | 0.10 | 1.67 | 0.00 | 0.00 | 2.73 | 3.75 | 2.44 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.01 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.53Mg1.38Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -15394.87 (J) H = -12032.40 (J) S = 2.38 (J/K) V = 0.30 (cc) Cp = 1.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.96 | 96.71 | 53.42 | 3.30 | -3.09 | 5.38 | 0.24 |

Total solids mass = 1.01 (gm) density = 3.33 (gm/cc)
G = -15394.87 (J) H = -12032.40 (J) S = 2.38 (J/K) V = 0.30 (cc) Cp = 1.24 (J/K)

Viscosity of the System: 4.99 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1651824.03 (J) H = -1274426.43 (J) S = 267.06 (J/K) V = 40.57 (cc) Cp = 135.19 (J/K)

Oxygen delta moles = 3.59403e-05 delta grams = 0.00115005
G = -11.65 (J) H = 1.34 (J) S = 0.01 (J/K) V = 4.22 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1130.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.33 COH = 2.23 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 98.47 (gm) density = 2.46 (gm/cc) viscosity = 5.08 (log 10 poise) (analysis in wt %)
G = -1625980.70 (J) H = -1257830.19 (J) S = 262.37 (J/K) V = 40.06 (cc) Cp = 133.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.92 | 0.51 | 14.15 | 0.86 | 0.00 | 3.83 | 0.10 | 1.55 | 0.00 | 0.00 | 2.74 | 3.77 | 2.45 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.53 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.55Mg1.35Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -23161.45 (J) H = -18132.02 (J) S = 3.58 (J/K) V = 0.46 (cc) Cp = 1.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.89 | 96.56 | 55.37 | 3.39 | -3.18 | 5.51 | 0.25 |

Total solids mass = 1.53 (gm) density = 3.34 (gm/cc)
G = -23161.45 (J) H = -18132.02 (J) S = 3.58 (J/K) V = 0.46 (cc) Cp = 1.87 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1649142.15 (J) H = -1275962.20 (J) S = 265.96 (J/K) V = 40.52 (cc) Cp = 135.00 (J/K)

Oxygen delta moles = 5.53758e-06 delta grams = 0.000177196

G = -1.78 (J)  H = 0.21 (J)  S = 0.00 (J/K)  V = 0.65 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1120.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.53  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.22  IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.96 (gm)  density = 2.46 (gm/cc)  viscosity = 5.18 (log 10 poise)  (analysis in wt %)
G = -1615798.52 (J)  H = -1253439.77 (J)  S = 260.10 (J/K)  V = 39.86 (cc)  Cp = 132.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.01 | 0.51 | 14.21 | 0.84 | 0.00 | 3.75 | 0.10 | 1.44 | 0.00 | 0.00 | 2.75 | 3.79 | 2.46 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.04 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.33Fe'''0.02Ti0.00Al0.09Si1.94O6
G = -30671.47 (J)  H = -24050.00 (J)  S = 4.75 (J/K)  V = 0.61 (cc)  Cp = 2.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.87 | 96.40 | 57.35 | 3.48 | -3.28 | 5.64 | 0.26 |

Total solids  mass = 2.04 (gm)  density = 3.35 (gm/cc)
G = -30671.47 (J)  H = -24050.00 (J)  S = 4.75 (J/K)  V = 0.61 (cc)  Cp = 2.49 (J/K)

Viscosity of the System: 5.20 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1646469.99 (J)  H = -1277489.77 (J)  S = 264.85 (J/K)  V = 40.47 (cc)  Cp = 134.81 (J/K)

Oxygen  delta moles = -2.73069e-05  delta grams = -0.000873787
G = 8.71 (J)  H = -1.00 (J)  S = -0.01 (J/K)  V = -3.16 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1110.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.20  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.46 (gm)  density = 2.46 (gm/cc)  viscosity = 5.28 (log 10 poise)  (analysis in wt %)
G = -1605863.22 (J)  H = -1249209.11 (J)  S = 257.86 (J/K)  V = 39.66 (cc)  Cp = 131.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.10 | 0.51 | 14.27 | 0.83 | 0.00 | 3.67 | 0.10 | 1.34 | 0.00 | 0.00 | 2.76 | 3.81 | 2.47 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.54 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.59Mg1.31Fe'''0.02Ti0.00Al0.10Si1.94O6
G = -37944.31 (J)  H = -29800.58 (J)  S = 5.89 (J/K)  V = 0.76 (cc)  Cp = 3.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.89 | 96.25 | 59.38 | 3.59 | -3.38 | 5.78 | 0.27 |

Total solids mass = 2.54 (gm) density = 3.36 (gm/cc)
G = -37944.31 (J) H = -29800.58 (J) S = 5.89 (J/K) V = 0.76 (cc) Cp = 3.09 (J/K)

Viscosity of the System: 5.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1643807.53 (J) H = -1279009.69 (J) S = 263.74 (J/K) V = 40.42 (cc) Cp = 134.62 (J/K)

Oxygen delta moles = -6.27166e-05 delta grams = -0.00200685
G = 19.85 (J) H = -2.28 (J) S = -0.02 (J/K) V = -7.21 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1100.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.18 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 96.96 (gm) density = 2.46 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1596157.70 (J) H = -1245126.04 (J) S = 255.64 (J/K) V = 39.47 (cc) Cp = 130.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.19 | 0.52 | 14.33 | 0.82 | 0.00 | 3.58 | 0.10 | 1.24 | 0.00 | 0.00 | 2.77 | 3.83 | 2.49 | 0.10 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.03 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.61Mg1.28Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -44997.04 (J) H = -35396.35 (J) S = 6.99 (J/K) V = 0.90 (cc) Cp = 3.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.94 | 96.10 | 61.43 | 3.69 | -3.48 | 5.93 | 0.28 |

Total solids mass = 3.03 (gm) density = 3.37 (gm/cc)
G = -44997.04 (J) H = -35396.35 (J) S = 6.99 (J/K) V = 0.90 (cc) Cp = 3.67 (J/K)

Viscosity of the System: 5.42 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1641154.74 (J) H = -1280522.39 (J) S = 262.63 (J/K) V = 40.37 (cc) Cp = 134.43 (J/K)

Oxygen delta moles = -0.000100797 delta grams = -0.00322539
G = 31.64 (J) H = -3.63 (J) S = -0.03 (J/K) V = -11.51 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1090.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.16 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 96.48 (gm) density = 2.46 (gm/cc) viscosity = 5.48 (log 10 poise) (analysis in wt %)
G = -1586667.21 (J) H = -1241180.03 (J) S = 253.45 (J/K) V = 39.28 (cc) Cp = 130.00 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.28 0.52 14.39 0.81 0.00 3.49 0.10 1.14 0.00 0.00 2.78 3.85 2.50 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.52 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.64Mg1.26Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -51844.41 (J) H = -40848.25 (J) S = 8.07 (J/K) V = 1.04 (cc) Cp = 4.24 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-66.03 95.94 63.51 3.81 -3.60 6.08 0.29

Total solids mass = 3.52 (gm) density = 3.38 (gm/cc)
G = -51844.41 (J) H = -40848.25 (J) S = 8.07 (J/K) V = 1.04 (cc) Cp = 4.24 (J/K)

Viscosity of the System: 5.53 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1638511.62 (J) H = -1282028.28 (J) S = 261.51 (J/K) V = 40.32 (cc) Cp = 134.25 (J/K)

Oxygen delta moles = -0.000141633 delta grams = -0.00453208
G = 44.10 (J) H = -5.04 (J) S = -0.04 (J/K) V = -16.05 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1080.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.30 COH = 2.14 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 96.00 (gm) density = 2.46 (gm/cc) viscosity = 5.59 (log 10 poise) (analysis in wt %)
G = -1577379.41 (J) H = -1237362.15 (J) S = 251.28 (J/K) V = 39.09 (cc) Cp = 129.26 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.37 0.52 14.44 0.79 0.00 3.39 0.10 1.06 0.00 0.00 2.78 3.87 2.51 0.10 1.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.00 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.66Mg1.24Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -58498.78 (J) H = -46165.52 (J) S = 9.11 (J/K) V = 1.18 (cc) Cp = 4.80 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-68.15 95.79 65.60 3.93 -3.72 6.24 0.30

Total solids mass = 4.00 (gm) density = 3.39 (gm/cc)
G = -58498.78 (J) H = -46165.52 (J) S = 9.11 (J/K) V = 1.18 (cc) Cp = 4.80 (J/K)

Viscosity of the System: 5.64 (log 10 poise)

System mass = 99.99 (gm) density = 2.48 (gm/cc)
G = -1635878.19 (J) H = -1283527.67 (J) S = 260.39 (J/K) V = 40.27 (cc) Cp = 134.07 (J/K)

Oxygen delta moles = -0.000185282 delta grams = -0.0059288
G = 57.23 (J) H = -6.53 (J) S = -0.05 (J/K) V = -20.85 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1070.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.30  COH = 2.12  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.52 (gm)  density = 2.46 (gm/cc)  viscosity = 5.70 (log 10 poise)  (analysis in wt %)
G = -1568284.35 (J)  H = -1233665.13 (J)  S = 249.13 (J/K)  V = 38.91 (cc)  Cp = 128.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.47 | 0.52 | 14.50 | 0.77 | 0.00 | 3.29 | 0.11 | 0.98 | 0.00 | 0.00 | 2.79 | 3.89 | 2.52 | 0.11 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.47 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.68Mg1.21Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -64970.13 (J)  H = -51355.66 (J)  S = 10.14 (J/K)  V = 1.31 (cc)  Cp = 5.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.27 | 95.64 | 67.70 | 4.06 | -3.85 | 6.41 | 0.31 |

Total solids  mass = 4.47 (gm)  density = 3.40 (gm/cc)
G = -64970.13 (J)  H = -51355.66 (J)  S = 10.14 (J/K)  V = 1.31 (cc)  Cp = 5.35 (J/K)

Viscosity of the System: 5.76 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.49 (gm/cc)
G = -1633254.49 (J)  H = -1285020.78 (J)  S = 259.27 (J/K)  V = 40.22 (cc)  Cp = 133.89 (J/K)

Oxygen  delta moles = -0.000231773  delta grams = -0.00741647
G = 71.00 (J)  H = -8.09 (J)  S = -0.06 (J/K)  V = -25.88 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1060.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.29  COH = 2.10  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.06 (gm)  density = 2.45 (gm/cc)  viscosity = 5.81 (log 10 poise)  (analysis in wt %)
G = -1559374.53 (J)  H = -1230083.39 (J)  S = 247.00 (J/K)  V = 38.73 (cc)  Cp = 127.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.57 | 0.53 | 14.56 | 0.76 | 0.00 | 3.18 | 0.11 | 0.90 | 0.00 | 0.00 | 2.80 | 3.91 | 2.54 | 0.11 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.93 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.19Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -71266.04 (J)  H = -56424.39 (J)  S = 11.13 (J/K)  V = 1.45 (cc)  Cp = 5.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.41 | 95.50 | 69.79 | 4.19 | -3.98 | 6.58 | 0.32 |

Total solids  mass = 4.93 (gm)  density = 3.41 (gm/cc)

G = -71266.04 (J)  H = -56424.39 (J)  S = 11.13 (J/K)  V = 1.45 (cc)  Cp = 5.88 (J/K)

Viscosity of the System: 5.87 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.49 (gm/cc)
G = -1630640.57 (J)  H = -1286507.79 (J)  S = 258.14 (J/K)  V = 40.17 (cc)  Cp = 133.71 (J/K)

Oxygen  delta moles = -0.000281102  delta grams = -0.00899494
G = 85.39 (J)  H = -9.70 (J)  S = -0.07 (J/K)  V = -31.16 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1050.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.29  COH = 2.08  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 92.34 (gm)  density = 2.45 (gm/cc)  viscosity = 5.92 (log 10 poise)  (analysis in wt %)
G = -1513302.72 (J)  H = -1196935.33 (J)  S = 239.10 (J/K)  V = 37.67 (cc)  Cp = 123.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.91 | 0.54 | 14.40 | 0.74 | 0.00 | 3.10 | 0.11 | 0.82 | 0.00 | 0.00 | 2.73 | 3.85 | 2.60 | 0.11 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.56 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.73Mg1.16Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -79666.53 (J)  H = -63155.37 (J)  S = 12.48 (J/K)  V = 1.63 (cc)  Cp = 6.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.48 | 95.54 | 72.75 | 4.22 | -4.01 | 6.66 | 0.32 |

feldspar  mass = 2.08 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.03Na0.65Ca0.31Al1.31Si2.69O8
G = -35050.50 (J)  H = -28479.77 (J)  S = 4.97 (J/K)  V = 0.80 (cc)  Cp = 2.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.48 | 31.48 | 3.04 |

Total solids  mass = 7.64 (gm)  density = 3.15 (gm/cc)
G = -114717.03 (J)  H = -91635.14 (J)  S = 17.44 (J/K)  V = 2.42 (cc)  Cp = 9.15 (J/K)

Viscosity of the System: 6.03 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.49 (gm/cc)
G = -1628019.75 (J)  H = -1288570.48 (J)  S = 256.55 (J/K)  V = 40.09 (cc)  Cp = 133.10 (J/K)

Oxygen  delta moles = -0.000367092  delta grams = -0.0117465
G = 110.58 (J)  H = -12.54 (J)  S = -0.09 (J/K)  V = -40.38 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1040.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.28  COH = 2.06  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 88.83 (gm) density = 2.45 (gm/cc) viscosity = 6.03 (log 10 poise) (analysis in wt %)
G = -1454153.09 (J) H = -1153194.67 (J) S = 229.19 (J/K) V = 36.29 (cc) Cp = 118.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.37 | 0.56 | 14.16 | 0.73 | 0.00 | 3.02 | 0.11 | 0.74 | 0.00 | 0.00 | 2.63 | 3.76 | 2.68 | 0.11 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.23 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.76Mg1.13Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -88460.13 (J) H = -70207.07 (J) S = 13.90 (J/K) V = 1.81 (cc) Cp = 7.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -78.91 | 95.68 | 76.02 | 4.20 | -3.99 | 6.69 | 0.32 |

feldspar mass = 4.92 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.66Ca0.31Al1.31Si2.69O8
G = -82793.62 (J) H = -67418.96 (J) S = 11.71 (J/K) V = 1.89 (cc) Cp = 6.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.20 | 30.59 | 3.21 |

Total solids mass = 11.16 (gm) density = 3.01 (gm/cc)
G = -171253.75 (J) H = -137626.04 (J) S = 25.61 (J/K) V = 3.70 (cc) Cp = 13.38 (J/K)

Viscosity of the System: 6.20 (log 10 poise)

System mass = 99.98 (gm) density = 2.50 (gm/cc)
G = -1625406.84 (J) H = -1290820.71 (J) S = 254.80 (J/K) V = 40.00 (cc) Cp = 132.35 (J/K)

Oxygen delta moles = -0.000470768 delta grams = -0.015064
G = 140.62 (J) H = -15.91 (J) S = -0.12 (J/K) V = -51.40 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1030.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.27 COH = 2.04 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 85.53 (gm) density = 2.44 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -1398908.51 (J) H = -1112344.15 (J) S = 219.90 (J/K) V = 35.01 (cc) Cp = 114.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.82 | 0.58 | 13.93 | 0.71 | 0.00 | 2.92 | 0.12 | 0.67 | 0.00 | 0.00 | 2.54 | 3.66 | 2.77 | 0.12 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.87 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.79Mg1.10Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -96604.54 (J) H = -76764.69 (J) S = 15.22 (J/K) V = 1.99 (cc) Cp = 8.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.21 | 95.81 | 79.17 | 4.19 | -3.98 | 6.71 | 0.31 |

feldspar mass = 7.58 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.03Na0.67Ca0.30Al1.30Si2.70O8
G = -127297.21 (J) H = -103885.05 (J) S = 17.97 (J/K) V = 2.91 (cc) Cp = 9.32 (J/K)
albite anorthite sanidine
66.84 29.79 3.36

Total solids mass = 14.45 (gm) density = 2.95 (gm/cc)
G = -223901.75 (J) H = -180649.74 (J) S = 33.19 (J/K) V = 4.90 (cc) Cp = 17.41 (J/K)

Viscosity of the System: 6.38 (log 10 poise)

System mass = 99.98 (gm) density = 2.51 (gm/cc)
G = -1622810.26 (J) H = -1292993.90 (J) S = 253.09 (J/K) V = 39.91 (cc) Cp = 131.73 (J/K)

Oxygen delta moles = -0.000576328 delta grams = -0.0184418
G = 170.69 (J) H = -19.27 (J) S = -0.15 (J/K) V = -62.44 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1020.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.27 COH = 2.02 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 82.44 (gm) density = 2.44 (gm/cc) viscosity = 6.25 (log 10 poise) (analysis in wt %)
G = -1347338.21 (J) H = -1074216.55 (J) S = 211.21 (J/K) V = 33.80 (cc) Cp = 109.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.27 | 0.61 | 13.70 | 0.68 | 0.00 | 2.80 | 0.12 | 0.61 | 0.00 | 0.00 | 2.46 | 3.55 | 2.85 | 0.12 | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.47 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.07Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -104140.96 (J) H = -82861.65 (J) S = 16.46 (J/K) V = 2.16 (cc) Cp = 8.75 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-85.36 95.93 82.18 4.17 -3.96 6.73 0.30

feldspar mass = 10.07 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.67Ca0.29Al1.29Si2.71O8
G = -168750.90 (J) H = -138017.56 (J) S = 23.77 (J/K) V = 3.87 (cc) Cp = 12.37 (J/K)
albite anorthite sanidine
67.41 29.08 3.52

Total solids mass = 17.54 (gm) density = 2.91 (gm/cc)
G = -272891.86 (J) H = -220879.20 (J) S = 40.22 (J/K) V = 6.02 (cc) Cp = 21.12 (J/K)

Viscosity of the System: 6.56 (log 10 poise)

System mass = 99.98 (gm) density = 2.51 (gm/cc)
G = -1620230.07 (J) H = -1295095.76 (J) S = 251.43 (J/K) V = 39.82 (cc) Cp = 131.09 (J/K)

Oxygen delta moles = -0.000682875 delta grams = -0.0218512
G = 200.52 (J) H = -22.59 (J) S = -0.17 (J/K) V = -73.42 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1010.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.26  COH = 2.00
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 79.55 (gm)  density = 2.43 (gm/cc)  viscosity = 6.36 (log 10 poise)  (analysis in wt %)
G = -1299240.95 (J)  H = -1038666.83 (J)  S = 203.07 (J/K)  V = 32.67 (cc)  Cp = 105.92 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.72 0.63 13.49 0.66 0.00 2.68 0.13 0.55 0.00 0.00 2.39 3.44 2.93 0.13 1.26 0.00 0.00 0.00 0.00

orthopyroxene  mass = 8.04 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.85Mg1.04Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -111098.63 (J)  H = -88521.76 (J)  S = 17.59 (J/K)  V = 2.31 (cc)  Cp = 9.38 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-88.32 96.06 85.03 4.16 -3.95 6.73 0.30

feldspar  mass = 12.39 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -207326.80 (J)  H = -169942.01 (J)  S = 29.14 (J/K)  V = 4.76 (cc)  Cp = 15.20 (J/K)
albite anorthite sanidine
67.91 28.43 3.66

Total solids  mass = 20.42 (gm)  density = 2.89 (gm/cc)
G = -318425.43 (J)  H = -258463.76 (J)  S = 46.73 (J/K)  V = 7.07 (cc)  Cp = 24.58 (J/K)

Viscosity of the System: 6.75 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.52 (gm/cc)
G = -1617666.38 (J)  H = -1297130.60 (J)  S = 249.80 (J/K)  V = 39.74 (cc)  Cp = 130.50 (J/K)

Oxygen  delta moles = -0.000789451  delta grams = -0.0252615
G = 229.83 (J)  H = -25.83 (J)  S = -0.20 (J/K)  V = -84.22 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1000.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.25  COH = 1.98
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 74.66 (gm)  density = 2.43 (gm/cc)  viscosity = 6.41 (log 10 poise)  (analysis in wt %)
G = -1217953.48 (J)  H = -975809.77 (J)  S = 190.19 (J/K)  V = 30.71 (cc)  Cp = 99.32 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.78 0.67 13.42 0.64 0.00 2.59 0.13 0.50 0.00 0.00 2.33 3.36 3.09 0.13 1.35 0.00 0.00 0.00 0.00

orthopyroxene  mass = 8.65 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)

opx Na0.00Ca0.04Fe"0.88Mg1.01Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -118542.65 (J) H = -94587.37 (J) S = 18.82 (J/K) V = 2.48 (cc) Cp = 10.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.30 | 96.16 | 87.80 | 4.20 | -3.97 | 6.82 | 0.29 |

feldspar mass = 15.27 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -255307.36 (J) H = -209735.42 (J) S = 35.79 (J/K) V = 5.87 (cc) Cp = 18.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.11 | 27.98 | 3.91 |

quartz mass = 1.39 (gm) density = 2.55 (gm/cc)
SiO2
G = -23313.54 (J) H = -19378.80 (J) S = 3.09 (J/K) V = 0.55 (cc) Cp = 1.65 (J/K)

Total solids mass = 25.31 (gm) density = 2.85 (gm/cc)
G = -397163.54 (J) H = -323701.59 (J) S = 57.70 (J/K) V = 8.89 (cc) Cp = 30.43 (J/K)

Viscosity of the System: 6.92 (log 10 poise)

System mass = 99.97 (gm) density = 2.52 (gm/cc)
G = -1615117.03 (J) H = -1299511.35 (J) S = 247.89 (J/K) V = 39.60 (cc) Cp = 129.76 (J/K)

Oxygen delta moles = -0.000901685 delta grams = -0.0288528
G = 260.23 (J) H = -29.18 (J) S = -0.23 (J/K) V = -95.45 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 990.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.25 COH = 1.96 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 69.60 (gm) density = 2.43 (gm/cc) viscosity = 6.42 (log 10 poise) (analysis in wt %)
G = -1134091.33 (J) H = -910466.58 (J) S = 177.04 (J/K) V = 28.67 (cc) Cp = 92.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.72 | 0.72 | 13.40 | 0.63 | 0.00 | 2.51 | 0.14 | 0.46 | 0.00 | 0.00 | 2.28 | 3.28 | 3.27 | 0.14 | 1.44 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.22 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg0.99Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -125501.60 (J) H = -100293.01 (J) S = 19.96 (J/K) V = 2.63 (cc) Cp = 10.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.07 | 96.26 | 90.36 | 4.25 | -4.01 | 6.93 | 0.28 |

feldspar mass = 18.09 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -301824.60 (J) H = -248500.88 (J) S = 42.21 (J/K) V = 6.95 (cc) Cp = 22.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.19 | 27.62 | 4.19 |

quartz mass = 3.06 (gm) density = 2.55 (gm/cc)

SiO2
G = -51171.20 (J)  H = -42627.48 (J)  S = 6.76 (J/K)  V = 1.20 (cc)  Cp = 3.63 (J/K)

Total solids  mass = 30.37 (gm)  density = 2.82 (gm/cc)
G = -478497.40 (J)  H = -391421.37 (J)  S = 68.94 (J/K)  V = 10.78 (cc)  Cp = 36.47 (J/K)

Viscosity of the System: 7.11 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.53 (gm/cc)
G = -1612588.73 (J)  H = -1301887.96 (J)  S = 245.97 (J/K)  V = 39.45 (cc)  Cp = 129.03 (J/K)

Oxygen  delta moles = -0.00101133  delta grams = -0.0323614
G = 289.32 (J)  H = -32.37 (J)  S = -0.25 (J/K)  V = -106.21 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 980.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.24  COH = 1.93  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 65.07 (gm)  density = 2.42 (gm/cc)  viscosity = 6.44 (log 10 poise)  (analysis in wt %)
G = -1059321.70 (J)  H = -852183.84 (J)  S = 165.29 (J/K)  V = 26.85 (cc)  Cp = 86.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.66 | 0.77 | 13.39 | 0.61 | 0.00 | 2.41 | 0.15 | 0.42 | 0.00 | 0.00 | 2.23 | 3.20 | 3.46 | 0.15 | 1.54 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.75 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.96Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -131669.59 (J)  H = -105396.62 (J)  S = 20.97 (J/K)  V = 2.77 (cc)  Cp = 11.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.56 | 96.35 | 92.67 | 4.30 | -4.04 | 7.01 | 0.28 |

feldspar  mass = 20.60 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.04Na0.68Ca0.27Al1.27Si2.73O8
G = -343226.06 (J)  H = -283216.40 (J)  S = 47.89 (J/K)  V = 7.92 (cc)  Cp = 25.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.24 | 27.29 | 4.47 |

quartz  mass = 4.55 (gm)  density = 2.55 (gm/cc)
SiO2
G = -75864.91 (J)  H = -63335.63 (J)  S = 10.00 (J/K)  V = 1.78 (cc)  Cp = 5.39 (J/K)

Total solids  mass = 34.89 (gm)  density = 2.80 (gm/cc)
G = -550760.56 (J)  H = -451948.65 (J)  S = 78.85 (J/K)  V = 12.47 (cc)  Cp = 41.84 (J/K)

Viscosity of the System: 7.31 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.54 (gm/cc)
G = -1610082.26 (J)  H = -1304132.49 (J)  S = 244.14 (J/K)  V = 39.32 (cc)  Cp = 128.36 (J/K)

Oxygen  delta moles = -0.0011154  delta grams = -0.0356914

G = 316.29 (J)  H = -35.30 (J)  S = -0.28 (J/K)  V = -116.21 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 970.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.24  COH = 1.91  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 61.01 (gm)  density = 2.42 (gm/cc)  viscosity = 6.46 (log 10 poise)  (analysis in wt %)
G = -992330.93 (J)  H = -799938.43 (J)  S = 154.76 (J/K)  V = 25.21 (cc)  Cp = 81.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.60 | 0.82 | 13.38 | 0.59 | 0.00 | 2.30 | 0.16 | 0.39 | 0.00 | 0.00 | 2.19 | 3.12 | 3.64 | 0.16 | 1.65 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.22 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.95Mg0.94Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -137126.21 (J)  H = -109959.94 (J)  S = 21.85 (J/K)  V = 2.90 (cc)  Cp = 11.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.77 | 96.43 | 94.72 | 4.34 | -4.07 | 7.07 | 0.27 |

feldspar  mass = 22.86 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -380246.43 (J)  H = -314461.80 (J)  S = 52.92 (J/K)  V = 8.78 (cc)  Cp = 27.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.26 | 26.99 | 4.75 |

quartz  mass = 5.88 (gm)  density = 2.55 (gm/cc)
SiO2
G = -97893.26 (J)  H = -81903.16 (J)  S = 12.86 (J/K)  V = 2.30 (cc)  Cp = 6.96 (J/K)

Total solids  mass = 38.95 (gm)  density = 2.78 (gm/cc)
G = -615265.90 (J)  H = -506324.90 (J)  S = 87.63 (J/K)  V = 13.99 (cc)  Cp = 46.65 (J/K)

Viscosity of the System: 7.54 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.55 (gm/cc)
G = -1607596.83 (J)  H = -1306263.34 (J)  S = 242.40 (J/K)  V = 39.20 (cc)  Cp = 127.76 (J/K)

Oxygen  delta moles = -0.0012137  delta grams = -0.0388369
G = 341.11 (J)  H = -37.98 (J)  S = -0.30 (J/K)  V = -125.45 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 960.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = 0.23  COH = 1.89  IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 57.36 (gm)  density = 2.42 (gm/cc)  viscosity = 6.47 (log 10 poise)  (analysis in wt %)
G = -932035.36 (J)  H = -752886.93 (J)  S = 145.28 (J/K)  V = 23.74 (cc)  Cp = 76.24 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.54 0.87 13.37 0.57 0.00 2.19 0.18 0.36 0.00 0.00 2.15 3.04 3.82 0.18 1.75 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.64 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.97Mg0.92Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -141942.55 (J) H = -114037.51 (J) S = 22.63 (J/K) V = 3.01 (cc) Cp = 12.19 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-100.73 96.50 96.56 4.38 -4.09 7.11 0.27

feldspar mass = 24.89 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -413492.89 (J) H = -342716.43 (J) S = 57.39 (J/K) V = 9.56 (cc) Cp = 30.41 (J/K)
albite anorthite sanidine
68.26 26.71 5.03

quartz mass = 7.07 (gm) density = 2.55 (gm/cc)
SiO2
G = -117660.93 (J) H = -98654.88 (J) S = 15.41 (J/K) V = 2.77 (cc) Cp = 8.37 (J/K)

Total solids mass = 42.60 (gm) density = 2.78 (gm/cc)
G = -673096.38 (J) H = -555408.82 (J) S = 95.44 (J/K) V = 15.35 (cc) Cp = 50.96 (J/K)

Viscosity of the System: 7.81 (log 10 poise)

System mass = 99.96 (gm) density = 2.56 (gm/cc)
G = -1605131.74 (J) H = -1308295.75 (J) S = 240.71 (J/K) V = 39.09 (cc) Cp = 127.20 (J/K)

Oxygen delta moles = -0.00130618 delta grams = -0.0417962
G = 363.82 (J) H = -40.40 (J) S = -0.33 (J/K) V = -133.92 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 950.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.22 COH = 1.87 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 54.05 (gm) density = 2.41 (gm/cc) viscosity = 6.49 (log 10 poise) (analysis in wt %)
G = -877530.77 (J) H = -710325.95 (J) S = 136.70 (J/K) V = 22.40 (cc) Cp = 71.84 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.46 0.92 13.37 0.55 0.00 2.07 0.19 0.33 0.00 0.00 2.12 2.96 4.00 0.19 1.86 0.00 0.00 0.00 0.00

orthopyroxene mass = 11.01 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.91Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -146183.54 (J) H = -117678.73 (J) S = 23.30 (J/K) V = 3.11 (cc) Cp = 12.59 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.46 96.57 98.19 4.41 -4.11 7.13 0.26

feldspar mass = 26.74 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.05Na0.68Ca0.26Al1.26Si2.74O8
G = -443472.66 (J) H = -368380.95 (J) S = 61.39 (J/K) V = 10.27 (cc) Cp = 32.63 (J/K)
albite anorthite sanidine
68.23 26.46 5.31

quartz mass = 8.15 (gm) density = 2.55 (gm/cc)
SiO2
G = -135499.34 (J) H = -113856.94 (J) S = 17.69 (J/K) V = 3.20 (cc) Cp = 9.64 (J/K)

Total solids mass = 45.91 (gm) density = 2.77 (gm/cc)
G = -725155.55 (J) H = -599916.62 (J) S = 102.39 (J/K) V = 16.58 (cc) Cp = 54.85 (J/K)

Viscosity of the System: 8.14 (log 10 poise)

System mass = 99.96 (gm) density = 2.56 (gm/cc)
G = -1602686.32 (J) H = -1310242.57 (J) S = 239.09 (J/K) V = 38.99 (cc) Cp = 126.69 (J/K)

Oxygen delta moles = -0.0013929 delta grams = -0.0445712
G = 384.48 (J) H = -42.59 (J) S = -0.35 (J/K) V = -141.65 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 940.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.21 COH = 1.84 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 50.80 (gm) density = 2.41 (gm/cc) viscosity = 6.50 (log 10 poise) (analysis in wt %)
G = -824422.63 (J) H = -668733.88 (J) S = 128.33 (J/K) V = 21.10 (cc) Cp = 67.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.45 | 0.89 | 13.39 | 0.52 | 0.00 | 1.93 | 0.20 | 0.31 | 0.00 | 0.00 | 2.08 | 2.88 | 4.19 | 0.20 | 1.98 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.29 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.90Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -149241.82 (J) H = -120406.23 (J) S = 23.77 (J/K) V = 3.19 (cc) Cp = 12.87 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.64 96.61 99.36 4.42 -4.12 7.11 0.26

feldspar mass = 28.52 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -472248.87 (J) H = -393155.09 (J) S = 65.20 (J/K) V = 10.96 (cc) Cp = 34.76 (J/K)
albite anorthite sanidine
68.11 26.25 5.63

quartz mass = 9.24 (gm) density = 2.55 (gm/cc)
SiO2
G = -153380.03 (J) H = -129159.03 (J) S = 19.97 (J/K) V = 3.62 (cc) Cp = 10.92 (J/K)

rhm-oxide mass = 0.10 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.22Al0.11Ti0.83O3
G = -978.17 (J) H = -746.38 (J) S = 0.19 (J/K) V = 0.02 (cc) Cp = 0.09 (J/K)

geikielite hematite ilmenite pyrophanite corundum
10.65 11.07 70.23 2.50 5.55

Total solids mass = 49.15 (gm) density = 2.76 (gm/cc)
G = -775848.89 (J) H = -643466.73 (J) S = 109.12 (J/K) V = 17.79 (cc) Cp = 58.65 (J/K)

Viscosity of the System: 8.64 (log 10 poise)

System mass = 99.95 (gm) density = 2.57 (gm/cc)
G = -1600271.52 (J) H = -1312200.60 (J) S = 237.46 (J/K) V = 38.89 (cc) Cp = 126.17 (J/K)

Oxygen delta moles = -0.00145274 delta grams = -0.0464861
G = 397.36 (J) H = -43.90 (J) S = -0.36 (J/K) V = -146.53 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 47.80 (gm) density = 2.40 (gm/cc) viscosity = 6.52 (log 10 poise) (analysis in wt %)
G = -775433.49 (J) H = -630308.19 (J) S = 120.62 (J/K) V = 19.90 (cc) Cp = 63.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.45 | 0.84 | 13.41 | 0.49 | 0.00 | 1.80 | 0.20 | 0.29 | 0.00 | 0.00 | 2.04 | 2.80 | 4.38 | 0.21 | 2.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.52 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.89Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -151680.45 (J) H = -122656.56 (J) S = 24.12 (J/K) V = 3.25 (cc) Cp = 13.11 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-104.56 96.65 100.31 4.41 -4.13 7.06 0.25

feldspar mass = 30.16 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -498669.95 (J) H = -416070.87 (J) S = 68.65 (J/K) V = 11.59 (cc) Cp = 36.73 (J/K)
albite anorthite sanidine
67.96 26.07 5.97

quartz mass = 10.26 (gm) density = 2.55 (gm/cc)
SiO2
G = -170003.90 (J) H = -143465.02 (J) S = 22.06 (J/K) V = 4.02 (cc) Cp = 12.11 (J/K)

rhm-oxide mass = 0.21 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.22Al0.11Ti0.84O3
G = -2090.04 (J) H = -1599.57 (J) S = 0.41 (J/K) V = 0.05 (cc) Cp = 0.20 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.46 10.98 70.51 2.63 5.42

Total solids mass = 52.15 (gm) density = 2.76 (gm/cc)
G = -822444.34 (J) H = -683792.01 (J) S = 115.24 (J/K) V = 18.90 (cc) Cp = 62.14 (J/K)

Viscosity of the System: 9.69 (log 10 poise)

System mass = 99.95 (gm) density = 2.58 (gm/cc)
G = -1597877.83 (J) H = -1314100.20 (J) S = 235.86 (J/K) V = 38.80 (cc) Cp = 125.69 (J/K)

Oxygen delta moles = -0.0015035 delta grams = -0.0481103
G = 407.48 (J) H = -44.90 (J) S = -0.38 (J/K) V = -150.40 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 920.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.20 COH = 1.79 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 45.09 (gm) density = 2.40 (gm/cc) viscosity = 6.53 (log 10 poise) (analysis in wt %)
G = -730998.84 (J) H = -595418.19 (J) S = 113.63 (J/K) V = 18.81 (cc) Cp = 59.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.43 | 0.79 | 13.43 | 0.46 | 0.00 | 1.67 | 0.21 | 0.27 | 0.00 | 0.00 | 2.01 | 2.72 | 4.56 | 0.22 | 2.23 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.72 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.88Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -153761.78 (J) H = -124633.30 (J) S = 24.41 (J/K) V = 3.30 (cc) Cp = 13.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.37 | 96.69 | 101.15 | 4.41 | -4.14 | 7.01 | 0.25 |

feldspar mass = 31.66 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -522611.98 (J) H = -437011.50 (J) S = 71.74 (J/K) V = 12.16 (cc) Cp = 38.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.79 | 25.89 | 6.32 |

quartz mass = 11.18 (gm) density = 2.55 (gm/cc)
SiO2
G = -185080.77 (J) H = -156522.63 (J) S = 23.94 (J/K) V = 4.38 (cc) Cp = 13.18 (J/K)

rhm-oxide mass = 0.31 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.22Al0.11Ti0.84O3
G = -3047.69 (J) H = -2339.63 (J) S = 0.59 (J/K) V = 0.07 (cc) Cp = 0.29 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.29 | 10.87 | 70.78 | 2.76 | 5.31 |

Total solids mass = 54.86 (gm) density = 2.76 (gm/cc)
G = -864502.22 (J) H = -720507.07 (J) S = 120.68 (J/K) V = 19.91 (cc) Cp = 65.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.58 (gm/cc)
G = -1595501.06 (J) H = -1315925.27 (J) S = 234.32 (J/K) V = 38.72 (cc) Cp = 125.23 (J/K)

Oxygen delta moles = -0.00155203 delta grams = -0.0496631

G = 416.76 (J)  H = -45.79 (J)  S = -0.39 (J/K)  V = -153.96 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 910.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = 0.19  COH = 1.77  IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid  mass = 42.61 (gm)  density = 2.39 (gm/cc)  viscosity = 6.53 (log 10 poise)  (analysis in wt %)
G = -690463.30 (J)  H = -563552.44 (J)  S = 107.27 (J/K)  V = 17.82 (cc)  Cp = 56.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.40 | 0.74 | 13.45 | 0.43 | 0.00 | 1.54 | 0.22 | 0.25 | 0.00 | 0.00 | 1.98 | 2.64 | 4.75 | 0.24 | 2.36 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.89 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.88Fe'''0.03Ti0.00Al0.12Si1.93O6
G = -155534.07 (J)  H = -126372.93 (J)  S = 24.65 (J/K)  V = 3.34 (cc)  Cp = 13.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.06 | 96.73 | 101.88 | 4.40 | -4.15 | 6.95 | 0.24 |

feldspar  mass = 33.03 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.07Na0.68Ca0.26Al1.26Si2.74O8
G = -544430.87 (J)  H = -456261.49 (J)  S = 74.52 (J/K)  V = 12.69 (cc)  Cp = 40.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.61 | 25.71 | 6.68 |

quartz  mass = 12.03 (gm)  density = 2.55 (gm/cc)
SiO2
G = -198835.85 (J)  H = -168514.28 (J)  S = 25.63 (J/K)  V = 4.71 (cc)  Cp = 14.17 (J/K)

rhm-oxide  mass = 0.39 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'''0.21Al0.10Ti0.84O3
G = -3876.63 (J)  H = -2985.22 (J)  S = 0.75 (J/K)  V = 0.08 (cc)  Cp = 0.37 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.13 | 10.74 | 71.04 | 2.89 | 5.19 |

Total solids  mass = 57.34 (gm)  density = 2.75 (gm/cc)
G = -902677.41 (J)  H = -754133.92 (J)  S = 125.55 (J/K)  V = 20.83 (cc)  Cp = 68.16 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.59 (gm/cc)
G = -1593140.72 (J)  H = -1317686.36 (J)  S = 232.81 (J/K)  V = 38.64 (cc)  Cp = 124.81 (J/K)

Oxygen  delta moles = -0.00159838  delta grams = -0.0511463
G = 425.21 (J)  H = -46.59 (J)  S = -0.40 (J/K)  V = -157.23 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 900.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = 0.19  COH = 1.74  IW

= 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 40.33 (gm) density = 2.39 (gm/cc) viscosity = 6.54 (log 10 poise) (analysis in wt %)
G = -653281.98 (J) H = -534285.48 (J) S = 101.43 (J/K) V = 16.90 (cc) Cp = 53.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.34 | 0.70 | 13.47 | 0.41 | 0.00 | 1.43 | 0.23 | 0.24 | 0.00 | 0.00 | 1.95 | 2.56 | 4.92 | 0.25 | 2.49 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.04 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.87Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -157039.09 (J) H = -127907.00 (J) S = 24.83 (J/K) V = 3.38 (cc) Cp = 13.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.67 | 96.77 | 102.53 | 4.40 | -4.16 | 6.89 | 0.24 |

feldspar mass = 34.30 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.67Ca0.26Al1.26Si2.74O8
G = -564423.36 (J) H = -474058.23 (J) S = 77.03 (J/K) V = 13.17 (cc) Cp = 41.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.42 | 25.55 | 7.04 |

quartz mass = 12.81 (gm) density = 2.55 (gm/cc)
SiO2
G = -211454.59 (J) H = -179590.27 (J) S = 27.16 (J/K) V = 5.02 (cc) Cp = 15.07 (J/K)

rhm-oxide mass = 0.47 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.21Al0.10Ti0.84O3
G = -4597.36 (J) H = -3551.27 (J) S = 0.89 (J/K) V = 0.10 (cc) Cp = 0.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.99 | 10.60 | 71.31 | 3.02 | 5.08 |

Total solids mass = 59.61 (gm) density = 2.75 (gm/cc)
G = -937514.40 (J) H = -785106.78 (J) S = 129.91 (J/K) V = 21.67 (cc) Cp = 70.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.59 (gm/cc)
G = -1590796.38 (J) H = -1319392.26 (J) S = 231.35 (J/K) V = 38.57 (cc) Cp = 124.42 (J/K)

Oxygen delta moles = -0.00164262 delta grams = -0.0525619
G = 432.89 (J) H = -47.30 (J) S = -0.41 (J/K) V = -160.22 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 890.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.18 COH = 1.72 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 38.24 (gm) density = 2.38 (gm/cc) viscosity = 6.54 (log 10 poise) (analysis in wt %)
G = -618997.71 (J) H = -507260.10 (J) S = 96.06 (J/K) V = 16.05 (cc) Cp = 50.87 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.28 0.66 13.50 0.38 0.00 1.32 0.24 0.22 0.00 0.00 1.93 2.49 5.09 0.26 2.63 0.00 0.00 0.00 0.00

orthopyroxene mass = 12.17 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.87Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -158312.99 (J) H = -129262.82 (J) S = 24.98 (J/K) V = 3.41 (cc) Cp = 13.76 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.19 96.80 103.11 4.39 -4.16 6.82 0.24

feldspar mass = 35.47 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.67Ca0.25Al1.25Si2.75O8
G = -582839.32 (J) H = -490601.84 (J) S = 79.30 (J/K) V = 13.62 (cc) Cp = 43.02 (J/K)
albite anorthite sanidine
67.21 25.38 7.41

quartz mass = 13.53 (gm) density = 2.55 (gm/cc)
SiO2
G = -223091.21 (J) H = -189875.64 (J) S = 28.56 (J/K) V = 5.30 (cc) Cp = 15.91 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe'"0.21Al0.10Ti0.85O3
G = -5226.46 (J) H = -4049.91 (J) S = 1.01 (J/K) V = 0.11 (cc) Cp = 0.50 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.86 10.45 71.57 3.14 4.98

Total solids mass = 61.71 (gm) density = 2.75 (gm/cc)
G = -969469.98 (J) H = -813790.23 (J) S = 133.84 (J/K) V = 22.45 (cc) Cp = 73.19 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1588467.69 (J) H = -1321050.32 (J) S = 229.91 (J/K) V = 38.51 (cc) Cp = 124.06 (J/K)

Oxygen delta moles = -0.00168483 delta grams = -0.0539125
G = 439.81 (J) H = -47.91 (J) S = -0.42 (J/K) V = -162.94 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 880.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.17 COH = 1.69 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 36.30 (gm) density = 2.38 (gm/cc) viscosity = 6.54 (log 10 poise) (analysis in wt %)
G = -587223.61 (J) H = -482173.64 (J) S = 91.10 (J/K) V = 15.27 (cc) Cp = 48.30 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.19 0.62 13.53 0.36 0.00 1.22 0.25 0.21 0.00 0.00 1.91 2.41 5.26 0.28 2.77 0.00 0.00 0.00 0.00

orthopyroxene mass = 12.29 (gm) density = 3.57 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.04Mg0.86Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -159386.96 (J) H = -130463.99 (J) S = 25.08 (J/K) V = 3.44 (cc) Cp = 13.87 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.65 96.84 103.62 4.39 -4.17 6.74 0.23

feldspar mass = 36.57 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -599891.17 (J) H = -506062.69 (J) S = 81.37 (J/K) V = 14.04 (cc) Cp = 44.30 (J/K)
albite anorthite sanidine
66.98 25.23 7.79

quartz mass = 14.20 (gm) density = 2.55 (gm/cc)
SiO2
G = -233875.12 (J) H = -199475.39 (J) S = 29.83 (J/K) V = 5.57 (cc) Cp = 16.68 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe'"0.21Al0.10Ti0.85O3
G = -5777.47 (J) H = -4491.02 (J) S = 1.12 (J/K) V = 0.13 (cc) Cp = 0.56 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.73 10.29 71.83 3.26 4.87

Total solids mass = 63.65 (gm) density = 2.75 (gm/cc)
G = -998930.72 (J) H = -840493.09 (J) S = 137.40 (J/K) V = 23.18 (cc) Cp = 75.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.60 (gm/cc)
G = -1586154.33 (J) H = -1322666.72 (J) S = 228.49 (J/K) V = 38.44 (cc) Cp = 123.71 (J/K)

Oxygen delta moles = -0.00172508 delta grams = -0.0552004
G = 446.03 (J) H = -48.45 (J) S = -0.43 (J/K) V = -165.39 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 870.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.16 COH = 1.66 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 34.49 (gm) density = 2.37 (gm/cc) viscosity = 6.53 (log 10 poise) (analysis in wt %)
G = -557629.35 (J) H = -458767.32 (J) S = 86.48 (J/K) V = 14.53 (cc) Cp = 45.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.59 | 13.56 | 0.33 | 0.00 | 1.12 | 0.26 | 0.20 | 0.00 | 0.00 | 1.89 | 2.34 | 5.42 | 0.29 | 2.91 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.39 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.86Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -160287.95 (J) H = -131530.89 (J) S = 25.16 (J/K) V = 3.47 (cc) Cp = 13.96 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.05 96.88 104.07 4.39 -4.18 6.67 0.23

feldspar mass = 37.59 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -615761.26 (J) H = -520587.29 (J) S = 83.26 (J/K) V = 14.43 (cc) Cp = 45.51 (J/K)
albite anorthite sanidine
66.74 25.07 8.18

quartz mass = 14.83 (gm) density = 2.55 (gm/cc)
SiO2
G = -243915.92 (J) H = -208478.51 (J) S = 31.00 (J/K) V = 5.81 (cc) Cp = 17.41 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe'"0.20Al0.10Ti0.85O3
G = -6261.55 (J) H = -4882.71 (J) S = 1.21 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.62 10.13 72.10 3.38 4.78

Total solids mass = 65.45 (gm) density = 2.74 (gm/cc)
G = -1026226.67 (J) H = -865479.40 (J) S = 140.62 (J/K) V = 23.85 (cc) Cp = 77.47 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.60 (gm/cc)
G = -1583856.03 (J) H = -1324246.73 (J) S = 227.10 (J/K) V = 38.38 (cc) Cp = 123.39 (J/K)

Oxygen delta moles = -0.00176345 delta grams = -0.0564284
G = 451.57 (J) H = -48.90 (J) S = -0.44 (J/K) V = -167.61 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 860.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.64 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 32.80 (gm) density = 2.37 (gm/cc) viscosity = 6.52 (log 10 poise) (analysis in wt %)
G = -529930.37 (J) H = -436817.78 (J) S = 82.17 (J/K) V = 13.84 (cc) Cp = 43.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.98 | 0.55 | 13.59 | 0.31 | 0.00 | 1.04 | 0.27 | 0.19 | 0.00 | 0.00 | 1.87 | 2.27 | 5.57 | 0.31 | 3.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.47 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.86Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -161039.21 (J) H = -132481.14 (J) S = 25.20 (J/K) V = 3.49 (cc) Cp = 14.04 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.40 96.91 104.48 4.39 -4.19 6.60 0.22

feldspar mass = 38.56 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -630607.72 (J) H = -534302.96 (J) S = 84.99 (J/K) V = 14.80 (cc) Cp = 46.64 (J/K)
albite anorthite sanidine
66.49 24.92 8.59

quartz mass = 15.42 (gm) density = 2.55 (gm/cc)

SiO2
G = -253307.34 (J)  H = -216961.22 (J)  S = 32.08 (J/K)  V = 6.04 (cc)  Cp = 18.08 (J/K)

rhm-oxide  mass = 0.69 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe'''0.20Al0.09Ti0.85O3
G = -6687.92 (J)  H = -5231.72 (J)  S = 1.29 (J/K)  V = 0.15 (cc)  Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.50 | 9.96 | 72.36 | 3.50 | 4.68 |

Total solids  mass = 67.14 (gm)  density = 2.74 (gm/cc)
G = -1051642.19 (J)  H = -888977.05 (J)  S = 143.55 (J/K)  V = 24.49 (cc)  Cp = 79.40 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.61 (gm/cc)
G = -1581572.55 (J)  H = -1325794.83 (J)  S = 225.72 (J/K)  V = 38.33 (cc)  Cp = 123.08 (J/K)

Oxygen  delta moles = -0.00180004  delta grams = -0.0575992
G = 456.47 (J)  H = -49.28 (J)  S = -0.45 (J/K)  V = -169.59 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 850.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -12.84  delta HM = -5.08  NNO = 0.00  QFM = 0.15  COH = 1.61  IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid  mass = 31.21 (gm)  density = 2.37 (gm/cc)  viscosity = 6.51 (log 10 poise)  (analysis in wt %)
G = -503879.15 (J)  H = -416130.23 (J)  S = 78.13 (J/K)  V = 13.19 (cc)  Cp = 41.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.85 | 0.52 | 13.63 | 0.29 | 0.00 | 0.95 | 0.28 | 0.18 | 0.00 | 0.00 | 1.85 | 2.20 | 5.72 | 0.32 | 3.22 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.55 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.85Fe'''0.02Ti0.00Al0.11Si1.93O6
G = -161660.83 (J)  H = -133330.01 (J)  S = 25.22 (J/K)  V = 3.51 (cc)  Cp = 14.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.71 | 96.95 | 104.84 | 4.39 | -4.20 | 6.53 | 0.22 |

feldspar  mass = 39.48 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -644569.11 (J)  H = -547321.58 (J)  S = 86.58 (J/K)  V = 15.15 (cc)  Cp = 47.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.22 | 24.77 | 9.01 |

quartz  mass = 15.98 (gm)  density = 2.55 (gm/cc)
SiO2
G = -262130.35 (J)  H = -224989.44 (J)  S = 33.07 (J/K)  V = 6.26 (cc)  Cp = 18.71 (J/K)

rhm-oxide  mass = 0.73 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'''0.20Al0.09Ti0.86O3
G = -7064.28 (J)  H = -5543.66 (J)  S = 1.35 (J/K)  V = 0.16 (cc)  Cp = 0.68 (J/K)

geikielite hematite ilmenite pyrophanite corundum
9.39 9.79 72.62 3.61 4.59

Total solids mass = 68.73 (gm) density = 2.74 (gm/cc)
G = -1075424.56 (J) H = -911184.68 (J) S = 146.23 (J/K) V = 25.08 (cc) Cp = 81.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.61 (gm/cc)
G = -1579303.71 (J) H = -1327314.91 (J) S = 224.36 (J/K) V = 38.28 (cc) Cp = 122.79 (J/K)

Oxygen delta moles = -0.00183493 delta grams = -0.0587154
G = 460.77 (J) H = -49.58 (J) S = -0.45 (J/K) V = -171.35 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 840.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.14 COH = 1.58 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 29.71 (gm) density = 2.36 (gm/cc) viscosity = 6.49 (log 10 poise) (analysis in wt %)
G = -479258.25 (J) H = -396533.00 (J) S = 74.32 (J/K) V = 12.58 (cc) Cp = 39.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.70 | 0.48 | 13.66 | 0.28 | 0.00 | 0.88 | 0.29 | 0.17 | 0.00 | 0.00 | 1.84 | 2.13 | 5.86 | 0.34 | 3.38 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.62 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -162170.17 (J) H = -134090.70 (J) S = 25.23 (J/K) V = 3.53 (cc) Cp = 14.17 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.99 96.99 105.16 4.39 -4.21 6.45 0.21

feldspar mass = 40.35 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -657768.18 (J) H = -559742.60 (J) S = 88.06 (J/K) V = 15.49 (cc) Cp = 48.72 (J/K)
albite anorthite sanidine
65.93 24.63 9.44

quartz mass = 16.51 (gm) density = 2.55 (gm/cc)
SiO2
G = -270455.62 (J) H = -232620.81 (J) S = 33.99 (J/K) V = 6.47 (cc) Cp = 19.31 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.19Al0.09Ti0.86O3
G = -7397.09 (J) H = -5823.24 (J) S = 1.41 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.29 9.61 72.89 3.72 4.50

Total solids mass = 70.23 (gm) density = 2.74 (gm/cc)
G = -1097791.07 (J) H = -932277.36 (J) S = 148.69 (J/K) V = 25.64 (cc) Cp = 82.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.61 (gm/cc)
G = -1577049.33 (J) H = -1328810.36 (J) S = 223.01 (J/K) V = 38.22 (cc) Cp = 122.51 (J/K)

Oxygen delta moles = -0.00186819 delta grams = -0.0597799
G = 464.50 (J) H = -49.82 (J) S = -0.46 (J/K) V = -172.90 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 830.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.13 COH = 1.55 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 28.21 (gm) density = 2.36 (gm/cc) viscosity = 6.45 (log 10 poise) (analysis in wt %)
G = -454799.72 (J) H = -376965.64 (J) S = 70.56 (J/K) V = 11.97 (cc) Cp = 37.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.53 | 0.45 | 13.69 | 0.26 | 0.00 | 0.81 | 0.30 | 0.16 | 0.00 | 0.00 | 1.83 | 2.07 | 5.97 | 0.36 | 3.56 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.67 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -162573.17 (J) H = -134767.53 (J) S = 25.21 (J/K) V = 3.54 (cc) Cp = 14.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.24 | 97.03 | 105.44 | 4.40 | -4.23 | 6.39 | 0.21 |

feldspar mass = 41.08 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.66Ca0.25Al1.25Si2.75O8
G = -668658.58 (J) H = -570249.53 (J) S = 89.21 (J/K) V = 15.76 (cc) Cp = 49.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.66 | 24.54 | 9.80 |

feldspar mass = 0.16 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.03Al1.03Si2.97O8
G = -2454.93 (J) H = -2088.09 (J) S = 0.33 (J/K) V = 0.06 (cc) Cp = 0.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.26 | 2.61 | 65.14 |

quartz mass = 17.03 (gm) density = 2.55 (gm/cc)
SiO2
G = -278619.55 (J) H = -240142.54 (J) S = 34.88 (J/K) V = 6.67 (cc) Cp = 19.90 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.19Al0.09Ti0.86O3
G = -7703.50 (J) H = -6083.70 (J) S = 1.47 (J/K) V = 0.17 (cc) Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.18 | 9.43 | 73.15 | 3.82 | 4.42 |

Total solids mass = 71.73 (gm) density = 2.74 (gm/cc)
G = -1120009.72 (J) H = -953331.40 (J) S = 151.09 (J/K) V = 26.21 (cc) Cp = 84.61 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.62 (gm/cc)
G = -1574809.45 (J) H = -1330297.04 (J) S = 221.65 (J/K) V = 38.17 (cc) Cp = 122.25 (J/K)

Oxygen delta moles = -0.00189959 delta grams = -0.0607845
G = 467.61 (J) H = -49.99 (J) S = -0.47 (J/K) V = -174.23 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 820.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.12 COH = 1.52 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 26.14 (gm) density = 2.35 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -421467.13 (J) H = -349783.49 (J) S = 65.58 (J/K) V = 11.12 (cc) Cp = 34.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.33 | 0.41 | 13.70 | 0.25 | 0.00 | 0.77 | 0.32 | 0.15 | 0.00 | 0.00 | 1.85 | 2.10 | 5.90 | 0.38 | 3.84 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.71 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -162810.99 (J) H = -135314.05 (J) S = 25.15 (J/K) V = 3.55 (cc) Cp = 14.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.48 | 97.11 | 105.63 | 4.46 | -4.30 | 6.38 | 0.20 |

feldspar mass = 40.79 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -663294.33 (J) H = -566967.14 (J) S = 88.12 (J/K) V = 15.64 (cc) Cp = 49.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.68 | 25.03 | 9.28 |

feldspar mass = 1.77 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.66Na0.31Ca0.02Al1.02Si2.98O8
G = -27974.28 (J) H = -23847.91 (J) S = 3.77 (J/K) V = 0.70 (cc) Cp = 2.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.29 | 2.44 | 66.27 |

quartz mass = 17.68 (gm) density = 2.55 (gm/cc)
SiO2
G = -288962.77 (J) H = -249575.27 (J) S = 36.03 (J/K) V = 6.93 (cc) Cp = 20.64 (J/K)

rhm-oxide mass = 0.84 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.18Al0.09Ti0.86O3
G = -8076.57 (J) H = -6398.92 (J) S = 1.53 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.09 | 9.23 | 73.41 | 3.89 | 4.37 |

Total solids mass = 73.79 (gm) density = 2.73 (gm/cc)
G = -1151118.94 (J) H = -982103.29 (J) S = 154.61 (J/K) V = 27.00 (cc) Cp = 86.98 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.62 (gm/cc)
G = -1572586.07 (J) H = -1331886.79 (J) S = 220.19 (J/K) V = 38.12 (cc) Cp = 121.92 (J/K)

Oxygen delta moles = -0.00192655 delta grams = -0.0616473
G = 469.50 (J) H = -50.02 (J) S = -0.48 (J/K) V = -175.10 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 24.22 (gm) density = 2.35 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -390552.28 (J) H = -324512.30 (J) S = 60.97 (J/K) V = 10.33 (cc) Cp = 32.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.09 | 0.37 | 13.70 | 0.24 | 0.00 | 0.73 | 0.35 | 0.15 | 0.00 | 0.00 | 1.87 | 2.13 | 5.81 | 0.41 | 4.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.75 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -162995.64 (J) H = -135817.84 (J) S = 25.09 (J/K) V = 3.56 (cc) Cp = 14.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.72 | 97.19 | 105.80 | 4.52 | -4.37 | 6.37 | 0.20 |

feldspar mass = 40.57 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -659061.91 (J) H = -564628.77 (J) S = 87.18 (J/K) V = 15.55 (cc) Cp = 48.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.72 | 25.48 | 8.80 |

feldspar mass = 3.22 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.67Na0.30Ca0.02Al1.02Si2.98O8
G = -50729.48 (J) H = -43344.04 (J) S = 6.82 (J/K) V = 1.27 (cc) Cp = 3.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.37 | 2.28 | 67.35 |

quartz mass = 18.29 (gm) density = 2.55 (gm/cc)
SiO2
G = -298646.57 (J) H = -258473.77 (J) S = 37.09 (J/K) V = 7.17 (cc) Cp = 21.34 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.18Al0.09Ti0.87O3
G = -8391.74 (J) H = -6670.03 (J) S = 1.59 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.00 | 9.03 | 73.68 | 3.96 | 4.33 |

Total solids mass = 75.71 (gm) density = 2.73 (gm/cc)
G = -1179825.34 (J) H = -1008934.44 (J) S = 157.77 (J/K) V = 27.73 (cc) Cp = 89.17 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1570377.62 (J) H = -1333446.75 (J) S = 218.74 (J/K) V = 38.06 (cc) Cp = 121.62 (J/K)

Oxygen delta moles = -0.00195279 delta grams = -0.062487
G = 471.08 (J) H = -50.01 (J) S = -0.48 (J/K) V = -175.86 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 22.43 (gm) density = 2.34 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -361703.11 (J) H = -300868.56 (J) S = 56.69 (J/K) V = 9.59 (cc) Cp = 30.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.81 | 0.34 | 13.71 | 0.23 | 0.00 | 0.70 | 0.37 | 0.14 | 0.00 | 0.00 | 1.89 | 2.17 | 5.72 | 0.45 | 4.48 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.78 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -163135.67 (J) H = -136285.63 (J) S = 25.02 (J/K) V = 3.56 (cc) Cp = 14.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.95 | 97.28 | 105.96 | 4.58 | -4.44 | 6.37 | 0.19 |

feldspar mass = 40.41 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.26Al1.26Si2.74O8
G = -655716.42 (J) H = -563031.33 (J) S = 86.37 (J/K) V = 15.47 (cc) Cp = 48.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.76 | 25.89 | 8.35 |

feldspar mass = 4.53 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.68Na0.29Ca0.02Al1.02Si2.98O8
G = -71190.58 (J) H = -60963.06 (J) S = 9.53 (J/K) V = 1.79 (cc) Cp = 5.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.48 | 2.14 | 68.38 |

quartz mass = 18.88 (gm) density = 2.55 (gm/cc)
SiO2
G = -307780.79 (J) H = -266929.66 (J) S = 38.07 (J/K) V = 7.40 (cc) Cp = 21.99 (J/K)

rhm-oxide mass = 0.90 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.18Al0.09Ti0.87O3
G = -8657.41 (J) H = -6903.25 (J) S = 1.63 (J/K) V = 0.19 (cc) Cp = 0.83 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.91 | 8.83 | 73.96 | 4.02 | 4.28 |

Total solids mass = 77.50 (gm) density = 2.73 (gm/cc)
G = -1206480.87 (J) H = -1034112.94 (J) S = 160.62 (J/K) V = 28.42 (cc) Cp = 91.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1568183.98 (J) H = -1334981.50 (J) S = 217.31 (J/K) V = 38.01 (cc) Cp = 121.36 (J/K)

Oxygen delta moles = -0.00197832 delta grams = -0.0633037
G = 472.36 (J) H = -49.97 (J) S = -0.49 (J/K) V = -176.52 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 790.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = 0.09 COH = 1.43 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 20.75 (gm) density = 2.33 (gm/cc) viscosity = 5.95 (log 10 poise) (analysis in wt %)
G = -334603.72 (J) H = -278596.62 (J) S = 52.68 (J/K) V = 8.90 (cc) Cp = 27.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.49 | 0.31 | 13.72 | 0.23 | 0.00 | 0.67 | 0.40 | 0.14 | 0.00 | 0.00 | 1.91 | 2.21 | 5.62 | 0.48 | 4.84 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.81 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -163238.53 (J) H = -136723.32 (J) S = 24.94 (J/K) V = 3.57 (cc) Cp = 14.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.19 | 97.38 | 106.11 | 4.66 | -4.52 | 6.38 | 0.19 |

feldspar mass = 40.29 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.26Al1.26Si2.74O8
G = -653077.18 (J) H = -562025.06 (J) S = 85.64 (J/K) V = 15.42 (cc) Cp = 48.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.80 | 26.27 | 7.93 |

feldspar mass = 5.72 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -89737.88 (J) H = -77018.09 (J) S = 11.96 (J/K) V = 2.26 (cc) Cp = 6.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.63 | 2.00 | 69.37 |

quartz mass = 19.43 (gm) density = 2.55 (gm/cc)
SiO2
G = -316467.08 (J) H = -275028.27 (J) S = 38.98 (J/K) V = 7.62 (cc) Cp = 22.61 (J/K)

rhm-oxide mass = 0.92 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.17Al0.08Ti0.87O3
G = -8880.66 (J) H = -7103.89 (J) S = 1.67 (J/K) V = 0.20 (cc) Cp = 0.85 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.81 | 8.63 | 74.25 | 4.07 | 4.24 |

Total solids mass = 79.19 (gm) density = 2.72 (gm/cc)
G = -1231401.34 (J) H = -1057898.63 (J) S = 163.20 (J/K) V = 29.06 (cc) Cp = 93.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1566005.05 (J) H = -1336495.25 (J) S = 215.88 (J/K) V = 37.96 (cc) Cp = 121.12 (J/K)

Oxygen delta moles = -0.00200313 delta grams = -0.0640977
G = 473.36 (J) H = -49.90 (J) S = -0.49 (J/K) V = -177.06 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 780.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = 0.08 COH = 1.40 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 19.15 (gm) density = 2.32 (gm/cc) viscosity = 5.78 (log 10 poise) (analysis in wt %)
G = -308961.66 (J) H = -257458.24 (J) S = 48.90 (J/K) V = 8.24 (cc) Cp = 25.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.10 | 0.27 | 13.73 | 0.22 | 0.00 | 0.64 | 0.43 | 0.13 | 0.00 | 0.00 | 1.94 | 2.26 | 5.50 | 0.52 | 5.24 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.84 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -163310.86 (J) H = -137136.22 (J) S = 24.85 (J/K) V = 3.58 (cc) Cp = 14.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.43 | 97.47 | 106.25 | 4.73 | -4.60 | 6.39 | 0.18 |

feldspar mass = 40.21 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.27Al1.27Si2.73O8
G = -651009.57 (J) H = -561498.45 (J) S = 84.99 (J/K) V = 15.38 (cc) Cp = 48.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.85 | 26.62 | 7.53 |

feldspar mass = 6.82 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.70Na0.28Ca0.02Al1.02Si2.98O8
G = -106687.69 (J) H = -91770.17 (J) S = 14.16 (J/K) V = 2.69 (cc) Cp = 8.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.80 | 1.87 | 70.33 |

quartz mass = 19.97 (gm) density = 2.55 (gm/cc)
SiO2
G = -324803.47 (J) H = -282852.44 (J) S = 39.83 (J/K) V = 7.83 (cc) Cp = 23.21 (J/K)

rhm-oxide mass = 0.94 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.09Fe'"0.17Al0.08Ti0.87O3
G = -9067.53 (J) H = -7276.46 (J) S = 1.70 (J/K) V = 0.20 (cc) Cp = 0.87 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.72 | 8.43 | 74.55 | 4.10 | 4.20 |

Total solids mass = 80.78 (gm) density = 2.72 (gm/cc)
G = -1254879.12 (J) H = -1080533.74 (J) S = 165.55 (J/K) V = 29.67 (cc) Cp = 95.04 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1563840.78 (J) H = -1337991.99 (J) S = 214.45 (J/K) V = 37.92 (cc) Cp = 120.92 (J/K)

Oxygen delta moles = -0.00202725 delta grams = -0.0648695
G = 474.08 (J) H = -49.78 (J) S = -0.50 (J/K) V = -177.51 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 770.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = 0.07 COH = 1.37 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 17.63 (gm) density = 2.32 (gm/cc) viscosity = 5.59 (log 10 poise) (analysis in wt %)
G = -284493.94 (J) H = -237220.91 (J) S = 45.32 (J/K) V = 7.62 (cc) Cp = 23.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.64 | 0.24 | 13.76 | 0.22 | 0.00 | 0.62 | 0.46 | 0.13 | 0.00 | 0.00 | 1.98 | 2.33 | 5.36 | 0.57 | 5.70 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.86 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.85Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -163358.88 (J) H = -137529.35 (J) S = 24.76 (J/K) V = 3.58 (cc) Cp = 14.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.68 | 97.58 | 106.38 | 4.82 | -4.69 | 6.42 | 0.18 |

feldspar mass = 40.15 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.66Ca0.27Al1.27Si2.73O8
G = -649413.18 (J) H = -561368.57 (J) S = 84.40 (J/K) V = 15.35 (cc) Cp = 48.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.90 | 26.94 | 7.16 |

feldspar mass = 7.83 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.02Al1.02Si2.98O8
G = -122312.20 (J) H = -105444.69 (J) S = 16.17 (J/K) V = 3.09 (cc) Cp = 9.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.99 | 1.75 | 71.25 |

quartz mass = 20.49 (gm) density = 2.55 (gm/cc)
SiO2
G = -332889.77 (J) H = -290487.33 (J) S = 40.65 (J/K) V = 8.03 (cc) Cp = 23.79 (J/K)

rhm-oxide mass = 0.96 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.09Fe'"0.16Al0.08Ti0.88O3
G = -9223.17 (J) H = -7424.87 (J) S = 1.72 (J/K) V = 0.21 (cc) Cp = 0.88 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.62 | 8.23 | 74.87 | 4.12 | 4.16 |

Total solids mass = 82.30 (gm) density = 2.72 (gm/cc)
G = -1277197.21 (J) H = -1102254.81 (J) S = 167.71 (J/K) V = 30.26 (cc) Cp = 96.86 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.64 (gm/cc)
G = -1561691.15 (J) H = -1339475.72 (J) S = 213.02 (J/K) V = 37.87 (cc) Cp = 120.76 (J/K)

Oxygen delta moles = -0.00205068 delta grams = -0.0656194
G = 474.54 (J) H = -49.64 (J) S = -0.50 (J/K) V = -177.86 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 760.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = 0.07 COH = 1.34 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 16.16 (gm) density = 2.31 (gm/cc) viscosity = 5.37 (log 10 poise) (analysis in wt %)
G = -260908.65 (J) H = -217642.29 (J) S = 41.88 (J/K) V = 7.01 (cc) Cp = 22.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.09 | 0.21 | 13.79 | 0.21 | 0.00 | 0.59 | 0.50 | 0.13 | 0.00 | 0.00 | 2.02 | 2.41 | 5.21 | 0.62 | 6.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.89 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -163388.79 (J) H = -137907.80 (J) S = 24.66 (J/K) V = 3.58 (cc) Cp = 14.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.93 | 97.69 | 106.50 | 4.92 | -4.80 | 6.45 | 0.17 |

feldspar mass = 40.12 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.66Ca0.27Al1.27Si2.73O8
G = -648214.57 (J) H = -561575.11 (J) S = 83.86 (J/K) V = 15.33 (cc) Cp = 48.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.95 | 27.25 | 6.80 |

feldspar mass = 8.78 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.26Ca0.02Al1.02Si2.98O8
G = -136856.71 (J) H = -118245.96 (J) S = 18.01 (J/K) V = 3.46 (cc) Cp = 10.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.21 | 1.64 | 72.15 |

quartz mass = 21.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -340835.39 (J) H = -298027.16 (J) S = 41.43 (J/K) V = 8.24 (cc) Cp = 24.36 (J/K)

rhm-oxide mass = 0.98 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.09Fe'"0.16Al0.08Ti0.88O3
G = -9352.07 (J) H = -7552.48 (J) S = 1.74 (J/K) V = 0.21 (cc) Cp = 0.90 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.52 | 8.03 | 75.20 | 4.12 | 4.13 |

Total solids mass = 83.77 (gm) density = 2.72 (gm/cc)
G = -1298647.53 (J) H = -1123308.50 (J) S = 169.71 (J/K) V = 30.82 (cc) Cp = 98.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.64 (gm/cc)
G = -1559556.18 (J) H = -1340950.78 (J) S = 211.59 (J/K) V = 37.83 (cc) Cp = 120.65 (J/K)

Oxygen delta moles = -0.00207347 delta grams = -0.0663484
G = 474.73 (J) H = -49.47 (J) S = -0.51 (J/K) V = -178.11 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 750.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = 0.06 COH = 1.30 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 14.72 (gm) density = 2.30 (gm/cc) viscosity = 5.11 (log 10 poise) (analysis in wt %)
G = -237876.73 (J) H = -198445.93 (J) S = 38.54 (J/K) V = 6.41 (cc) Cp = 20.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.40 | 0.19 | 13.83 | 0.21 | 0.00 | 0.58 | 0.55 | 0.12 | 0.00 | 0.00 | 2.07 | 2.51 | 5.03 | 0.68 | 6.82 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.91 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.07Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -163407.33 (J) H = -138277.24 (J) S = 24.56 (J/K) V = 3.59 (cc) Cp = 14.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.19 | 97.80 | 106.60 | 5.03 | -4.91 | 6.51 | 0.17 |

feldspar mass = 40.11 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.66Ca0.28Al1.28Si2.72O8
G = -647363.73 (J) H = -562077.65 (J) S = 83.36 (J/K) V = 15.31 (cc) Cp = 48.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.01 | 27.53 | 6.46 |

feldspar mass = 9.67 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.73Na0.25Ca0.02Al1.02Si2.98O8
G = -150557.99 (J) H = -130372.75 (J) S = 19.73 (J/K) V = 3.81 (cc) Cp = 11.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 25.44 | 1.53 | 73.03 |

quartz mass = 21.52 (gm) density = 2.55 (gm/cc)
SiO2
G = -348772.00 (J) H = -305586.44 (J) S = 42.21 (J/K) V = 8.44 (cc) Cp = 24.92 (J/K)

rhm-oxide mass = 0.99 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.08Fe'"0.16Al0.08Ti0.88O3
G = -9458.14 (J) H = -7662.30 (J) S = 1.76 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.42 | 7.83 | 75.55 | 4.11 | 4.10 |

Total solids mass = 85.21 (gm) density = 2.72 (gm/cc)
G = -1319559.18 (J) H = -1143976.38 (J) S = 171.61 (J/K) V = 31.37 (cc) Cp = 100.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.64 (gm/cc)
G = -1557435.91 (J) H = -1342422.31 (J) S = 210.15 (J/K) V = 37.78 (cc) Cp = 120.62 (J/K)

Oxygen delta moles = -0.00209562 delta grams = -0.0670573
G = 474.68 (J) H = -49.26 (J) S = -0.51 (J/K) V = -178.27 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 740.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = 0.05 COH = 1.27 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 11.38 (gm) density = 2.27 (gm/cc) viscosity = 4.41 (log 10 poise) (analysis in wt %)
G = -183851.44 (J) H = -152836.01 (J) S = 30.61 (J/K) V = 5.02 (cc) Cp = 15.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.64 | 0.14 | 12.32 | 0.25 | 0.00 | 0.65 | 0.70 | 0.11 | 0.00 | 0.00 | 2.42 | 3.46 | 4.40 | 0.88 | 8.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.45 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.20Fe"0.63Mg0.18)3Al2Si3O12
G = -71741.91 (J) H = -61641.09 (J) S = 9.97 (J/K) V = 1.37 (cc) Cp = 5.77 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.69 | 19.52 | 17.79 |

orthopyroxene mass = 7.68 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.82Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -96372.74 (J) H = -81673.87 (J) S = 14.51 (J/K) V = 2.13 (cc) Cp = 8.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.95 | 97.50 | 109.61 | 4.13 | -4.04 | 5.56 | 0.18 |

biotite mass = 2.14 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -33189.10 (J) H = -28581.33 (J) S = 4.55 (J/K) V = 0.77 (cc) Cp = 2.66 (J/K)

| annite | phlogopite |
|---|---|
| 9.49 | 90.51 |

feldspar mass = 38.15 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -614695.67 (J) H = -534722.86 (J) S = 78.93 (J/K) V = 14.59 (cc) Cp = 46.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.46 | 24.82 | 6.72 |

feldspar mass = 9.83 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.26Ca0.01Al1.01Si2.99O8
G = -152894.86 (J) H = -132680.16 (J) S = 19.95 (J/K) V = 3.88 (cc) Cp = 11.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.32 | 1.40 | 72.28 |

quartz mass = 24.28 (gm) density = 2.55 (gm/cc)

SiO2
G = -392925.93 (J)  H = -344970.01 (J)  S = 47.33 (J/K)  V = 9.52 (cc)  Cp = 28.07 (J/K)

rhm-oxide  mass = 1.02 (gm)  density = 4.68 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.76Mg0.08Fe'"0.16Al0.07Ti0.88O3
G = -9633.94 (J)  H = -7818.76 (J)  S = 1.79 (J/K)  V = 0.22 (cc)  Cp = 0.93 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.84 | 8.12 | 76.24 | 4.31 | 3.50 |

Total solids  mass = 88.55 (gm)  density = 2.73 (gm/cc)
G = -1371454.15 (J)  H = -1192088.08 (J)  S = 177.04 (J/K)  V = 32.47 (cc)  Cp = 104.37 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.67 (gm/cc)
G = -1555305.58 (J)  H = -1344924.09 (J)  S = 207.65 (J/K)  V = 37.48 (cc)  Cp = 120.11 (J/K)

Oxygen  delta moles = -0.00218052  delta grams = -0.069774
G = 488.59 (J)  H = -50.50 (J)  S = -0.53 (J/K)  V = -183.68 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 730.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = 0.04  COH = 1.24  IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 8.89 (gm)  density = 2.24 (gm/cc)  viscosity = 3.75 (log 10 poise)  (analysis in wt %)
G = -143822.07 (J)  H = -119089.10 (J)  S = 24.66 (J/K)  V = 3.97 (cc)  Cp = 12.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.87 | 0.10 | 11.72 | 0.30 | 0.00 | 0.74 | 0.89 | 0.10 | 0.00 | 0.00 | 2.60 | 4.25 | 3.81 | 1.13 | 9.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 8.89 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.19Fe"0.65Mg0.17)3Al2Si3O12
G = -116042.56 (J)  H = -99858.52 (J)  S = 16.13 (J/K)  V = 2.23 (cc)  Cp = 9.36 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.64 | 18.63 | 16.73 |

orthopyroxene  mass = 3.74 (gm)  density = 3.63 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.78Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -46358.05 (J)  H = -39329.24 (J)  S = 7.01 (J/K)  V = 1.03 (cc)  Cp = 4.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.84 | 97.82 | 114.09 | 4.13 | -4.04 | 5.67 | 0.18 |

clinopyroxene  mass = 0.69 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.43Mg0.49Fe'"0.05Ti0.04Al0.19Si1.87O6
G = -9778.24 (J)  H = -8475.88 (J)  S = 1.30 (J/K)  V = 0.20 (cc)  Cp = 0.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.73 | 8.41 | 42.93 | 7.19 | 0.50 | 4.98 | 7.27 |

biotite  mass = 3.83 (gm)  density = 2.81 (gm/cc)  (analysis in mole %)

K(Fe"0.12Mg0.88)3AlSi3O10(OH)2
G = -58650.71 (J) H = -50558.15 (J) S = 8.07 (J/K) V = 1.36 (cc) Cp = 4.73 (J/K)

| annite | phlogopite |
|---|---|
| 12.27 | 87.73 |

feldspar mass = 36.81 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -592158.22 (J) H = -516096.10 (J) S = 75.82 (J/K) V = 14.10 (cc) Cp = 45.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.91 | 22.06 | 7.02 |

feldspar mass = 9.73 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.01Al1.01Si2.99O8
G = -151100.49 (J) H = -131403.54 (J) S = 19.64 (J/K) V = 3.83 (cc) Cp = 11.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.27 | 1.26 | 71.46 |

quartz mass = 26.34 (gm) density = 2.55 (gm/cc)
SiO2
G = -425757.84 (J) H = -374548.69 (J) S = 51.05 (J/K) V = 10.32 (cc) Cp = 30.41 (J/K)

rhm-oxide mass = 1.02 (gm) density = 4.69 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.07Fe'"0.17Al0.07Ti0.88O3
G = -9563.50 (J) H = -7778.06 (J) S = 1.78 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.14 | 8.38 | 76.81 | 4.36 | 3.31 |

Total solids mass = 91.04 (gm) density = 2.73 (gm/cc)
G = -1409409.61 (J) H = -1228048.19 (J) S = 180.79 (J/K) V = 33.30 (cc) Cp = 107.48 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.68 (gm/cc)
G = -1553231.68 (J) H = -1347137.29 (J) S = 205.45 (J/K) V = 37.27 (cc) Cp = 119.96 (J/K)

Oxygen delta moles = -0.00219799 delta grams = -0.0703331
G = 487.14 (J) H = -50.14 (J) S = -0.54 (J/K) V = -183.32 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 3.93 (log 10 poise)  (analysis in wt %)
G = -1691689.00 (J)  H = -1247986.38 (J)  S = 282.05 (J/K)  V = 40.75 (cc)  Cp = 143.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.82 | 0.00 | 4.08 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.93 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1691689.00 (J)  H = -1247986.38 (J)  S = 282.05 (J/K)  V = 40.75 (cc)  Cp = 143.16 (J/K)

Oxygen  delta moles = 9.02056e-17  delta grams = 2.88647e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 3.98 (log 10 poise)  (analysis in wt %)
G = -1688874.74 (J)  H = -1249419.31 (J)  S = 281.13 (J/K)  V = 40.72 (cc)  Cp = 143.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.83 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.98 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1688874.74 (J)  H = -1249419.31 (J)  S = 281.13 (J/K)  V = 40.72 (cc)  Cp = 143.15 (J/K)

Oxygen  delta moles = 3.04038e-06  delta grams = 9.72886e-05
G = -1.10 (J)  H = 0.13 (J)  S = 0.00 (J/K)  V = 0.40 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.04 (log 10 poise)  (analysis in wt %)
G = -1686069.82 (J)  H = -1250852.33 (J)  S = 280.22 (J/K)  V = 40.69 (cc)  Cp = 143.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.83 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.04 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1686069.82 (J)  H = -1250852.33 (J)  S = 280.22 (J/K)  V = 40.69 (cc)  Cp = 143.14 (J/K)

Oxygen  delta moles = 6.42624e-06  delta grams = 0.000205632
G = -2.31 (J)  H = 0.27 (J)  S = 0.00 (J/K)  V = 0.83 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.10 (log 10 poise)  (analysis in wt %)
G = -1683274.31 (J)  H = -1252285.44 (J)  S = 279.29 (J/K)  V = 40.66 (cc)  Cp = 143.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.83 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.10 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1683274.31 (J)  H = -1252285.44 (J)  S = 279.29 (J/K)  V = 40.66 (cc)  Cp = 143.14 (J/K)

Oxygen  delta moles = 1.01673e-05  delta grams = 0.000325341
G = -3.64 (J)  H = 0.43 (J)  S = 0.00 (J/K)  V = 1.30 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.16 (log 10 poise)  (analysis in wt %)
G = -1680488.27 (J)  H = -1253718.66 (J)  S = 278.36 (J/K)  V = 40.63 (cc)  Cp = 143.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.83 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.16 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1680488.27 (J)  H = -1253718.66 (J)  S = 278.36 (J/K)  V = 40.63 (cc)  Cp = 143.13 (J/K)

Oxygen  delta moles = 1.42737e-05  delta grams = 0.000456741
G = -5.07 (J)  H = 0.60 (J)  S = 0.00 (J/K)  V = 1.82 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.22 (log 10 poise)  (analysis in wt %)
G = -1677711.76 (J)  H = -1255151.98 (J)  S = 277.42 (J/K)  V = 40.60 (cc)  Cp = 143.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.83 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.22 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1677711.76 (J)  H = -1255151.98 (J)  S = 277.42 (J/K)  V = 40.60 (cc)  Cp = 143.12 (J/K)

Oxygen  delta moles = 1.8756e-05  delta grams = 0.00060017
G = -6.61 (J)  H = 0.78 (J)  S = 0.00 (J/K)  V = 2.38 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.28 (log 10 poise) (analysis in wt %)
G = -1674944.85 (J) H = -1256585.42 (J) S = 276.48 (J/K) V = 40.57 (cc) Cp = 143.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.83 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.28 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1674944.85 (J) H = -1256585.42 (J) S = 276.48 (J/K) V = 40.57 (cc) Cp = 143.12 (J/K)

Oxygen delta moles = 2.36253e-05 delta grams = 0.000755981
G = -8.27 (J) H = 0.97 (J) S = 0.01 (J/K) V = 2.97 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.34 (log 10 poise) (analysis in wt %)
G = -1672187.61 (J) H = -1258018.99 (J) S = 275.53 (J/K) V = 40.54 (cc) Cp = 143.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.83 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.34 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1672187.61 (J) H = -1258018.99 (J) S = 275.53 (J/K) V = 40.54 (cc) Cp = 143.11 (J/K)

Oxygen delta moles = 2.8893e-05 delta grams = 0.000924541
G = -10.03 (J) H = 1.18 (J) S = 0.01 (J/K) V = 3.61 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -1669440.11 (J) H = -1259452.69 (J) S = 274.58 (J/K) V = 40.51 (cc) Cp = 143.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.84 | 0.00 | 4.07 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.40 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1669440.11 (J) H = -1259452.69 (J) S = 274.58 (J/K) V = 40.51 (cc) Cp = 143.10 (J/K)

Oxygen delta moles = 3.45711e-05 delta grams = 0.00110623
G = -11.92 (J) H = 1.39 (J) S = 0.01 (J/K) V = 4.29 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.46 (log 10 poise) (analysis in wt %)
G = -1666702.41 (J) H = -1260886.53 (J) S = 273.62 (J/K) V = 40.48 (cc) Cp = 143.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.84 | 0.00 | 4.06 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.46 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1666702.41 (J) H = -1260886.53 (J) S = 273.62 (J/K) V = 40.48 (cc) Cp = 143.10 (J/K)

Oxygen delta moles = 4.06722e-05 delta grams = 0.00130146
G = -13.92 (J) H = 1.63 (J) S = 0.01 (J/K) V = 5.02 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.52 (log 10 poise) (analysis in wt %)
G = -1663974.47 (J) H = -1262269.50 (J) S = 272.68 (J/K) V = 40.45 (cc) Cp = 135.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.84 | 0.00 | 4.06 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1663974.47 (J) H = -1262269.50 (J) S = 272.68 (J/K) V = 40.45 (cc) Cp = 135.63 (J/K)

Oxygen delta moles = 4.72094e-05 delta grams = 0.00151064
G = -16.03 (J) H = 1.87 (J) S = 0.01 (J/K) V = 5.78 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.59 (log 10 poise) (analysis in wt %)
G = -1661256.00 (J) H = -1263629.02 (J) S = 271.76 (J/K) V = 40.42 (cc) Cp = 135.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.84 | 0.00 | 4.06 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.59 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1661256.00 (J) H = -1263629.02 (J) S = 271.76 (J/K) V = 40.42 (cc) Cp = 135.61 (J/K)

Oxygen delta moles = 5.41962e-05 delta grams = 0.00173421
G = -18.26 (J) H = 2.13 (J) S = 0.01 (J/K) V = 6.59 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.65 (log 10 poise) (analysis in wt %)
G = -1658547.04 (J) H = -1264988.52 (J) S = 270.83 (J/K) V = 40.40 (cc) Cp = 135.58 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.68 0.50 13.96 0.84 0.00 4.06 0.10 1.91 0.00 0.00 2.71 3.72 2.41 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.65 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1658547.04 (J) H = -1264988.52 (J) S = 270.83 (J/K) V = 40.40 (cc) Cp = 135.58 (J/K)

Oxygen delta moles = 6.16469e-05 delta grams = 0.00197263
G = -20.62 (J) H = 2.40 (J) S = 0.02 (J/K) V = 7.45 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 99.74 (gm) density = 2.48 (gm/cc) viscosity = 4.73 (log 10 poise) (analysis in wt %)
G = -1651773.25 (J) H = -1263288.20 (J) S = 269.19 (J/K) V = 40.28 (cc) Cp = 135.15 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.72 0.50 13.99 0.84 0.00 4.03 0.10 1.84 0.00 0.00 2.72 3.73 2.42 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.26 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.50Mg1.41Fe'''0.02Ti0.00Al0.09Si1.95O6
G = -4065.73 (J) H = -3156.73 (J) S = 0.63 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-53.10 96.88 50.47 3.31 -3.11 5.29 0.26

Total solids mass = 0.26 (gm) density = 3.32 (gm/cc)
G = -4065.73 (J) H = -3156.73 (J) S = 0.63 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)

Viscosity of the System: 4.74 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1655838.98 (J) H = -1266444.92 (J) S = 269.82 (J/K) V = 40.35 (cc) Cp = 135.47 (J/K)

Oxygen delta moles = 5.3496e-05 delta grams = 0.00171181
G = -17.75 (J) H = 2.06 (J) S = 0.01 (J/K) V = 6.42 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 99.20 (gm) density = 2.48 (gm/cc) viscosity = 4.83 (log 10 poise) (analysis in wt %)
G = -1640945.97 (J) H = -1258519.42 (J) S = 266.84 (J/K) V = 40.06 (cc) Cp = 134.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.81 | 0.51 | 14.06 | 0.83 | 0.00 | 3.96 | 0.10 | 1.72 | 0.00 | 0.00 | 2.73 | 3.75 | 2.43 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.80 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.52Mg1.39Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -12185.58 (J) H = -9476.79 (J) S = 1.89 (J/K) V = 0.24 (cc) Cp = 0.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.93 | 96.74 | 52.32 | 3.40 | -3.20 | 5.41 | 0.27 |

Total solids mass = 0.80 (gm) density = 3.33 (gm/cc)
G = -12185.58 (J) H = -9476.79 (J) S = 1.89 (J/K) V = 0.24 (cc) Cp = 0.98 (J/K)

Viscosity of the System: 4.84 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1653131.56 (J) H = -1267996.21 (J) S = 268.73 (J/K) V = 40.30 (cc) Cp = 135.27 (J/K)

Oxygen delta moles = 2.70795e-05 delta grams = 0.00086651
G = -8.92 (J) H = 1.03 (J) S = 0.01 (J/K) V = 3.23 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 98.68 (gm) density = 2.48 (gm/cc) viscosity = 4.92 (log 10 poise) (analysis in wt %)
G = -1630415.92 (J) H = -1253944.79 (J) S = 264.53 (J/K) V = 39.86 (cc) Cp = 133.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.89 | 0.51 | 14.12 | 0.82 | 0.00 | 3.89 | 0.10 | 1.60 | 0.00 | 0.00 | 2.74 | 3.77 | 2.44 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.32 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.54Mg1.36Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -20017.99 (J) H = -15593.61 (J) S = 3.11 (J/K) V = 0.40 (cc) Cp = 1.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.81 | 96.59 | 54.21 | 3.49 | -3.29 | 5.53 | 0.28 |

Total solids mass = 1.32 (gm) density = 3.33 (gm/cc)
G = -20017.99 (J) H = -15593.61 (J) S = 3.11 (J/K) V = 0.40 (cc) Cp = 1.62 (J/K)

Viscosity of the System: 4.94 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1650433.91 (J) H = -1269538.40 (J) S = 267.64 (J/K) V = 40.25 (cc) Cp = 135.08 (J/K)

Oxygen delta moles = -1.40248e-06 delta grams = -4.48775e-05
G = 0.46 (J) H = -0.05 (J) S = -0.00 (J/K) V = -0.17 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1140.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.26 COH = 2.13 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 98.17 (gm) density = 2.48 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1620160.56 (J) H = -1249548.64 (J) S = 262.26 (J/K) V = 39.65 (cc) Cp = 132.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.97 | 0.51 | 14.18 | 0.81 | 0.00 | 3.82 | 0.10 | 1.49 | 0.00 | 0.00 | 2.75 | 3.78 | 2.46 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.83 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.56Mg1.34Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -27585.43 (J) H = -21523.48 (J) S = 4.29 (J/K) V = 0.55 (cc) Cp = 2.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.74 | 96.44 | 56.15 | 3.59 | -3.38 | 5.66 | 0.29 |

Total solids mass = 1.83 (gm) density = 3.34 (gm/cc)
G = -27585.43 (J) H = -21523.48 (J) S = 4.29 (J/K) V = 0.55 (cc) Cp = 2.24 (J/K)

Viscosity of the System: 5.05 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1647746.00 (J) H = -1271072.12 (J) S = 266.55 (J/K) V = 40.20 (cc) Cp = 134.89 (J/K)

Oxygen delta moles = -3.20795e-05 delta grams = -0.00102651
G = 10.40 (J) H = -1.20 (J) S = -0.01 (J/K) V = -3.77 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 97.67 (gm) density = 2.48 (gm/cc) viscosity = 5.12 (log 10 poise) (analysis in wt %)
G = -1610159.52 (J) H = -1245316.72 (J) S = 260.02 (J/K) V = 39.46 (cc) Cp = 131.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.06 | 0.51 | 14.24 | 0.80 | 0.00 | 3.74 | 0.10 | 1.38 | 0.00 | 0.00 | 2.76 | 3.80 | 2.47 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.33 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.58Mg1.32Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -34908.26 (J) H = -27281.24 (J) S = 5.44 (J/K) V = 0.69 (cc) Cp = 2.84 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-60.71 96.28 58.12 3.69 -3.48 5.80 0.30

Total solids mass = 2.33 (gm) density = 3.35 (gm/cc)
G = -34908.26 (J) H = -27281.24 (J) S = 5.44 (J/K) V = 0.69 (cc) Cp = 2.84 (J/K)

Viscosity of the System: 5.15 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1645067.78 (J) H = -1272597.95 (J) S = 265.45 (J/K) V = 40.15 (cc) Cp = 134.70 (J/K)

Oxygen delta moles = -6.50709e-05 delta grams = -0.00208219
G = 20.93 (J) H = -2.41 (J) S = -0.02 (J/K) V = -7.59 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1120.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.25 COH = 2.09 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 97.18 (gm) density = 2.47 (gm/cc) viscosity = 5.22 (log 10 poise) (analysis in wt %)
G = -1600394.58 (J) H = -1241236.19 (J) S = 257.80 (J/K) V = 39.26 (cc) Cp = 131.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.15 | 0.52 | 14.30 | 0.79 | 0.00 | 3.66 | 0.10 | 1.28 | 0.00 | 0.00 | 2.76 | 3.82 | 2.48 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.82 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.60Mg1.30Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -42004.67 (J) H = -32880.21 (J) S = 6.55 (J/K) V = 0.84 (cc) Cp = 3.42 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-62.72 96.13 60.13 3.80 -3.59 5.94 0.31

Total solids mass = 2.82 (gm) density = 3.36 (gm/cc)
G = -42004.67 (J) H = -32880.21 (J) S = 6.55 (J/K) V = 0.84 (cc) Cp = 3.42 (J/K)

Viscosity of the System: 5.26 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1642399.25 (J) H = -1274116.41 (J) S = 264.35 (J/K) V = 40.10 (cc) Cp = 134.52 (J/K)

Oxygen delta moles = -0.000100481 delta grams = -0.00321529
G = 32.06 (J) H = -3.69 (J) S = -0.03 (J/K) V = -11.64 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1110.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.24 COH = 2.07 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 96.69 (gm) density = 2.47 (gm/cc) viscosity = 5.32 (log 10 poise) (analysis in wt %)
G = -1590849.75 (J) H = -1237295.74 (J) S = 255.62 (J/K) V = 39.07 (cc) Cp = 130.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.24 | 0.52 | 14.36 | 0.78 | 0.00 | 3.57 | 0.10 | 1.18 | 0.00 | 0.00 | 2.77 | 3.84 | 2.49 | 0.10 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.30 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.62Mg1.27Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -48890.64 (J) H = -38332.19 (J) S = 7.63 (J/K) V = 0.98 (cc) Cp = 4.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.76 | 95.97 | 62.17 | 3.91 | -3.71 | 6.10 | 0.32 |

Total solids mass = 3.30 (gm) density = 3.37 (gm/cc)
G = -48890.64 (J) H = -38332.19 (J) S = 7.63 (J/K) V = 0.98 (cc) Cp = 4.00 (J/K)

Viscosity of the System: 5.36 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1639740.39 (J) H = -1275627.93 (J) S = 263.25 (J/K) V = 40.05 (cc) Cp = 134.34 (J/K)

Oxygen delta moles = -0.000138399 delta grams = -0.0044286
G = 43.80 (J) H = -5.03 (J) S = -0.04 (J/K) V = -15.92 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1100.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.05 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 96.21 (gm) density = 2.47 (gm/cc) viscosity = 5.42 (log 10 poise) (analysis in wt %)
G = -1581511.34 (J) H = -1233485.54 (J) S = 253.45 (J/K) V = 38.89 (cc) Cp = 129.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.33 | 0.52 | 14.42 | 0.76 | 0.00 | 3.47 | 0.10 | 1.09 | 0.00 | 0.00 | 2.78 | 3.86 | 2.51 | 0.10 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.78 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.64Mg1.25Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -55579.88 (J) H = -43647.32 (J) S = 8.69 (J/K) V = 1.12 (cc) Cp = 4.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.84 | 95.81 | 64.23 | 4.03 | -3.83 | 6.26 | 0.33 |

Total solids mass = 3.78 (gm) density = 3.38 (gm/cc)
G = -55579.88 (J) H = -43647.32 (J) S = 8.69 (J/K) V = 1.12 (cc) Cp = 4.56 (J/K)

Viscosity of the System: 5.47 (log 10 poise)

System mass = 99.99 (gm) density = 2.50 (gm/cc)
G = -1637091.22 (J) H = -1277132.86 (J) S = 262.14 (J/K) V = 40.00 (cc) Cp = 134.16 (J/K)

Oxygen delta moles = -0.000178889 delta grams = -0.00572424

G = 56.16 (J)  H = -6.43 (J)  S = -0.05 (J/K)  V = -20.42 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1090.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.93  delta HM = -4.91  NNO = 0.00  QFM = 0.23  COH = 2.03  IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.74 (gm)  density = 2.47 (gm/cc)  viscosity = 5.53 (log 10 poise)  (analysis in wt %)
G = -1572367.93 (J)  H = -1229797.36 (J)  S = 251.31 (J/K)  V = 38.70 (cc)  Cp = 128.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.43 | 0.52 | 14.47 | 0.75 | 0.00 | 3.38 | 0.10 | 1.01 | 0.00 | 0.00 | 2.79 | 3.88 | 2.52 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.25 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.66Mg1.22Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -62083.82 (J)  H = -48834.15 (J)  S = 9.72 (J/K)  V = 1.25 (cc)  Cp = 5.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.93 | 95.66 | 66.30 | 4.16 | -3.95 | 6.42 | 0.34 |

Total solids  mass = 4.25 (gm)  density = 3.39 (gm/cc)
G = -62083.82 (J)  H = -48834.15 (J)  S = 9.72 (J/K)  V = 1.25 (cc)  Cp = 5.10 (J/K)

Viscosity of the System: 5.58 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.50 (gm/cc)
G = -1634451.75 (J)  H = -1278631.51 (J)  S = 261.03 (J/K)  V = 39.96 (cc)  Cp = 133.98 (J/K)

Oxygen  delta moles = -0.000221994  delta grams = -0.00710355
G = 69.13 (J)  H = -7.90 (J)  S = -0.06 (J/K)  V = -25.16 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1080.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.22  COH = 2.01  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.28 (gm)  density = 2.47 (gm/cc)  viscosity = 5.63 (log 10 poise)  (analysis in wt %)
G = -1563410.47 (J)  H = -1226224.57 (J)  S = 249.19 (J/K)  V = 38.52 (cc)  Cp = 128.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.52 | 0.53 | 14.53 | 0.73 | 0.00 | 3.27 | 0.11 | 0.93 | 0.00 | 0.00 | 2.80 | 3.90 | 2.53 | 0.11 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.71 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.68Mg1.20Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -68411.56 (J)  H = -53899.51 (J)  S = 10.72 (J/K)  V = 1.38 (cc)  Cp = 5.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.03 | 95.51 | 68.37 | 4.30 | -4.09 | 6.59 | 0.36 |

Total solids mass = 4.71 (gm) density = 3.40 (gm/cc)
G = -68411.56 (J) H = -53899.51 (J) S = 10.72 (J/K) V = 1.38 (cc) Cp = 5.64 (J/K)

Viscosity of the System: 5.70 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1631822.03 (J) H = -1280124.08 (J) S = 259.91 (J/K) V = 39.91 (cc) Cp = 133.81 (J/K)

Oxygen delta moles = -0.000267727 delta grams = -0.00856695
G = 82.69 (J) H = -9.44 (J) S = -0.07 (J/K) V = -30.12 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1070.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.22 COH = 1.99 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 94.82 (gm) density = 2.47 (gm/cc) viscosity = 5.74 (log 10 poise) (analysis in wt %)
G = -1554632.20 (J) H = -1222762.13 (J) S = 247.08 (J/K) V = 38.35 (cc) Cp = 127.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.62 | 0.53 | 14.58 | 0.71 | 0.00 | 3.16 | 0.11 | 0.86 | 0.00 | 0.00 | 2.80 | 3.92 | 2.54 | 0.11 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.17 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.18Fe'''0.03Ti0.00Al0.12Si1.93O6
G = -74569.92 (J) H = -58848.59 (J) S = 11.70 (J/K) V = 1.51 (cc) Cp = 6.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.14 | 95.36 | 70.43 | 4.44 | -4.23 | 6.77 | 0.37 |

Total solids mass = 5.17 (gm) density = 3.41 (gm/cc)
G = -74569.92 (J) H = -58848.59 (J) S = 11.70 (J/K) V = 1.51 (cc) Cp = 6.17 (J/K)

Viscosity of the System: 5.81 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1629202.12 (J) H = -1281610.72 (J) S = 258.79 (J/K) V = 39.86 (cc) Cp = 133.63 (J/K)

Oxygen delta moles = -0.000316071 delta grams = -0.0101139
G = 96.82 (J) H = -11.03 (J) S = -0.08 (J/K) V = -35.30 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1060.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.21 COH = 1.97 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 93.00 (gm) density = 2.47 (gm/cc) viscosity = 5.85 (log 10 poise) (analysis in wt %)
G = -1523427.17 (J) H = -1201497.68 (J) S = 241.48 (J/K) V = 37.64 (cc) Cp = 124.86 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.87 0.54 14.51 0.70 0.00 3.07 0.11 0.79 0.00 0.00 2.76 3.89 2.58 0.11 1.08 0.00 0.00 0.00 0.00

orthopyroxene mass = 5.72 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.73Mg1.15Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -81884.26 (J) H = -64713.90 (J) S = 12.88 (J/K) V = 1.67 (cc) Cp = 6.80 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-75.80 95.33 73.00 4.52 -4.31 6.89 0.37

feldspar mass = 1.26 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.66Ca0.31Al1.31Si2.69O8
G = -21270.73 (J) H = -17234.00 (J) S = 3.03 (J/K) V = 0.48 (cc) Cp = 1.55 (J/K)
albite anorthite sanidine
66.08 30.75 3.17

Total solids mass = 6.99 (gm) density = 3.24 (gm/cc)
G = -103155.00 (J) H = -81947.90 (J) S = 15.91 (J/K) V = 2.16 (cc) Cp = 8.34 (J/K)

Viscosity of the System: 5.95 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1626582.17 (J) H = -1283445.58 (J) S = 257.39 (J/K) V = 39.80 (cc) Cp = 133.20 (J/K)

Oxygen delta moles = -0.00038635 delta grams = -0.0123627
G = 117.36 (J) H = -13.34 (J) S = -0.10 (J/K) V = -42.82 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1050.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.95 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 89.41 (gm) density = 2.47 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -1463104.34 (J) H = -1156987.12 (J) S = 231.35 (J/K) V = 36.25 (cc) Cp = 119.78 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.32 0.56 14.27 0.68 0.00 2.99 0.11 0.71 0.00 0.00 2.67 3.79 2.67 0.11 1.12 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.39 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.76Mg1.12Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -90544.66 (J) H = -71641.22 (J) S = 14.29 (J/K) V = 1.86 (cc) Cp = 7.55 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-79.19 95.46 76.23 4.50 -4.29 6.92 0.37

feldspar mass = 4.19 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.67Ca0.30Al1.30Si2.70O8
G = -70313.71 (J) H = -57094.31 (J) S = 9.99 (J/K) V = 1.61 (cc) Cp = 5.11 (J/K)
albite anorthite sanidine
66.77 29.90 3.33

Total solids mass = 10.57 (gm) density = 3.05 (gm/cc)
G = -160858.37 (J) H = -128735.53 (J) S = 24.28 (J/K) V = 3.46 (cc) Cp = 12.66 (J/K)

Viscosity of the System: 6.12 (log 10 poise)

System mass = 99.98 (gm) density = 2.52 (gm/cc)
G = -1623962.71 (J) H = -1285722.65 (J) S = 255.63 (J/K) V = 39.71 (cc) Cp = 132.44 (J/K)

Oxygen delta moles = -0.000486485 delta grams = -0.015567
G = 146.55 (J) H = -16.62 (J) S = -0.12 (J/K) V = -53.52 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1040.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.93 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 86.06 (gm) density = 2.46 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -1406870.42 (J) H = -1115498.58 (J) S = 221.89 (J/K) V = 34.94 (cc) Cp = 115.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.77 | 0.58 | 14.03 | 0.66 | 0.00 | 2.89 | 0.12 | 0.64 | 0.00 | 0.00 | 2.58 | 3.69 | 2.75 | 0.12 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.01 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.79Mg1.09Fe"'0.03Ti0.00Al0.12Si1.93O6
G = -98557.89 (J) H = -78077.78 (J) S = 15.60 (J/K) V = 2.03 (cc) Cp = 8.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.46 | 95.60 | 79.35 | 4.49 | -4.28 | 6.94 | 0.36 |

feldspar mass = 6.91 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.67Ca0.29Al1.29Si2.71O8
G = -115931.53 (J) H = -94342.55 (J) S = 16.44 (J/K) V = 2.65 (cc) Cp = 8.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.37 | 29.13 | 3.50 |

Total solids mass = 13.93 (gm) density = 2.97 (gm/cc)
G = -214489.42 (J) H = -172420.33 (J) S = 32.04 (J/K) V = 4.68 (cc) Cp = 16.69 (J/K)

Viscosity of the System: 6.30 (log 10 poise)

System mass = 99.98 (gm) density = 2.52 (gm/cc)
G = -1621359.84 (J) H = -1287918.91 (J) S = 253.92 (J/K) V = 39.62 (cc) Cp = 131.74 (J/K)

Oxygen delta moles = -0.000588114 delta grams = -0.018819
G = 175.67 (J) H = -19.88 (J) S = -0.15 (J/K) V = -64.21 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1030.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.19 COH = 1.91 IW

= 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 82.92 (gm) density = 2.46 (gm/cc) viscosity = 6.18 (log 10 poise) (analysis in wt %)
G = -1354473.73 (J) H = -1076849.78 (J) S = 213.04 (J/K) V = 33.72 (cc) Cp = 110.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.22 | 0.60 | 13.80 | 0.64 | 0.00 | 2.78 | 0.12 | 0.58 | 0.00 | 0.00 | 2.50 | 3.58 | 2.83 | 0.12 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.61 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.06Fe"'0.03Ti0.00Al0.12Si1.93O6
G = -105965.63 (J) H = -84057.24 (J) S = 16.81 (J/K) V = 2.19 (cc) Cp = 8.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.56 | 95.73 | 82.32 | 4.47 | -4.26 | 6.95 | 0.35 |

feldspar mass = 9.45 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -158334.19 (J) H = -129134.00 (J) S = 22.41 (J/K) V = 3.63 (cc) Cp = 11.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.90 | 28.44 | 3.65 |

Total solids mass = 17.06 (gm) density = 2.93 (gm/cc)
G = -264299.83 (J) H = -213191.24 (J) S = 39.22 (J/K) V = 5.82 (cc) Cp = 20.54 (J/K)

Viscosity of the System: 6.48 (log 10 poise)

System mass = 99.98 (gm) density = 2.53 (gm/cc)
G = -1618773.56 (J) H = -1290041.02 (J) S = 252.26 (J/K) V = 39.54 (cc) Cp = 131.17 (J/K)

Oxygen delta moles = -0.000690386 delta grams = -0.0220915
G = 204.47 (J) H = -23.09 (J) S = -0.17 (J/K) V = -74.80 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1020.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.89 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 78.18 (gm) density = 2.46 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -1275623.76 (J) H = -1016489.63 (J) S = 200.39 (J/K) V = 31.84 (cc) Cp = 104.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.37 | 0.64 | 13.70 | 0.63 | 0.00 | 2.69 | 0.13 | 0.53 | 0.00 | 0.00 | 2.44 | 3.49 | 2.97 | 0.13 | 1.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.23 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.85Mg1.03Fe"'0.03Ti0.00Al0.12Si1.93O6
G = -113680.56 (J) H = -90298.65 (J) S = 18.08 (J/K) V = 2.36 (cc) Cp = 9.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.66 | 95.84 | 85.23 | 4.50 | -4.29 | 7.03 | 0.35 |

feldspar mass = 12.44 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -208097.01 (J) H = -170097.77 (J) S = 29.39 (J/K) V = 4.78 (cc) Cp = 15.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.17 | 27.95 | 3.88 |

quartz mass = 1.12 (gm) density = 2.55 (gm/cc)
SiO2
G = -18800.57 (J) H = -15551.79 (J) S = 2.51 (J/K) V = 0.44 (cc) Cp = 1.34 (J/K)

Total solids mass = 21.80 (gm) density = 2.88 (gm/cc)
G = -340578.14 (J) H = -275948.22 (J) S = 49.98 (J/K) V = 7.58 (cc) Cp = 26.23 (J/K)

Viscosity of the System: 6.66 (log 10 poise)

System mass = 99.97 (gm) density = 2.54 (gm/cc)
G = -1616201.90 (J) H = -1292437.84 (J) S = 250.37 (J/K) V = 39.42 (cc) Cp = 130.42 (J/K)

Oxygen delta moles = -0.000797649 delta grams = -0.0255238
G = 234.23 (J) H = -26.39 (J) S = -0.20 (J/K) V = -85.76 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1010.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.86 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 72.74 (gm) density = 2.45 (gm/cc) viscosity = 6.25 (log 10 poise) (analysis in wt %)
G = -1185395.45 (J) H = -946506.22 (J) S = 186.17 (J/K) V = 29.66 (cc) Cp = 96.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.31 | 0.69 | 13.67 | 0.62 | 0.00 | 2.62 | 0.14 | 0.49 | 0.00 | 0.00 | 2.38 | 3.41 | 3.16 | 0.14 | 1.38 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.84 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.88Mg1.00Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -121175.15 (J) H = -96389.17 (J) S = 19.32 (J/K) V = 2.53 (cc) Cp = 10.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.63 | 95.94 | 87.97 | 4.57 | -4.33 | 7.16 | 0.34 |

feldspar mass = 15.53 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -259322.87 (J) H = -212443.79 (J) S = 36.53 (J/K) V = 5.96 (cc) Cp = 19.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.25 | 27.58 | 4.17 |

quartz mass = 2.86 (gm) density = 2.55 (gm/cc)
SiO2
G = -47756.86 (J) H = -39591.08 (J) S = 6.36 (J/K) V = 1.12 (cc) Cp = 3.40 (J/K)

Total solids mass = 27.23 (gm) density = 2.83 (gm/cc)

G = -428254.88 (J)  H = -348424.04 (J)  S = 62.21 (J/K)  V = 9.61 (cc)  Cp = 32.73 (J/K)

Viscosity of the System: 6.83 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.55 (gm/cc)
G = -1613650.32 (J)  H = -1294930.26 (J)  S = 248.39 (J/K)  V = 39.28 (cc)  Cp = 129.64 (J/K)

Oxygen  delta moles = -0.000904839  delta grams = -0.0289538
G = 263.42 (J)  H = -29.61 (J)  S = -0.23 (J/K)  V = -96.53 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1000.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.17  COH = 1.84
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 67.89 (gm)  density = 2.45 (gm/cc)  viscosity = 6.27 (log 10 poise)  (analysis in wt %)
G = -1105174.31 (J)  H = -884262.19 (J)  S = 173.52 (J/K)  V = 27.73 (cc)  Cp = 90.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.25 | 0.73 | 13.66 | 0.60 | 0.00 | 2.53 | 0.15 | 0.45 | 0.00 | 0.00 | 2.33 | 3.34 | 3.34 | 0.15 | 1.48 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.40 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg0.98Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -127837.76 (J)  H = -101847.86 (J)  S = 20.41 (J/K)  V = 2.68 (cc)  Cp = 10.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.32 | 96.03 | 90.45 | 4.62 | -4.38 | 7.26 | 0.33 |

feldspar  mass = 18.28 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.04Na0.68Ca0.27Al1.27Si2.73O8
G = -304786.58 (J)  H = -250247.42 (J)  S = 42.84 (J/K)  V = 7.02 (cc)  Cp = 22.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.30 | 27.25 | 4.45 |

quartz  mass = 4.39 (gm)  density = 2.55 (gm/cc)
SiO2
G = -73322.09 (J)  H = -60918.12 (J)  S = 9.74 (J/K)  V = 1.72 (cc)  Cp = 5.22 (J/K)

Total solids  mass = 32.08 (gm)  density = 2.81 (gm/cc)
G = -505946.44 (J)  H = -413013.40 (J)  S = 72.99 (J/K)  V = 11.42 (cc)  Cp = 38.51 (J/K)

Viscosity of the System: 7.03 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.55 (gm/cc)
G = -1611120.75 (J)  H = -1297275.60 (J)  S = 246.51 (J/K)  V = 39.15 (cc)  Cp = 128.94 (J/K)

Oxygen  delta moles = -0.00100712  delta grams = -0.0322266
G = 290.65 (J)  H = -32.60 (J)  S = -0.25 (J/K)  V = -106.61 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 990.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.16  COH = 1.82  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 63.55 (gm)  density = 2.45 (gm/cc)  viscosity = 6.28 (log 10 poise)  (analysis in wt %)
G = -1033480.57 (J)  H = -828609.54 (J)  S = 162.19 (J/K)  V = 25.99 (cc)  Cp = 84.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.19 | 0.78 | 13.64 | 0.59 | 0.00 | 2.43 | 0.16 | 0.41 | 0.00 | 0.00 | 2.29 | 3.26 | 3.52 | 0.16 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.90 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.93Mg0.96Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -133752.66 (J)  H = -106740.39 (J)  S = 21.38 (J/K)  V = 2.82 (cc)  Cp = 11.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.72 | 96.11 | 92.68 | 4.67 | -4.41 | 7.34 | 0.33 |

feldspar  mass = 20.75 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -345336.30 (J)  H = -284175.36 (J)  S = 48.42 (J/K)  V = 7.96 (cc)  Cp = 25.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.32 | 26.94 | 4.74 |

quartz  mass = 5.76 (gm)  density = 2.55 (gm/cc)
SiO2
G = -96042.83 (J)  H = -79969.50 (J)  S = 12.72 (J/K)  V = 2.26 (cc)  Cp = 6.84 (J/K)

Total solids  mass = 36.41 (gm)  density = 2.79 (gm/cc)
G = -575131.80 (J)  H = -470885.25 (J)  S = 82.53 (J/K)  V = 13.04 (cc)  Cp = 43.67 (J/K)

Viscosity of the System: 7.24 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.56 (gm/cc)
G = -1608612.37 (J)  H = -1299494.79 (J)  S = 244.72 (J/K)  V = 39.03 (cc)  Cp = 128.29 (J/K)

Oxygen  delta moles = -0.00110422  delta grams = -0.0353336
G = 315.89 (J)  H = -35.34 (J)  S = -0.28 (J/K)  V = -115.97 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 980.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.15  COH = 1.80  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 59.65 (gm)  density = 2.44 (gm/cc)  viscosity = 6.30 (log 10 poise)  (analysis in wt %)
G = -969104.70 (J)  H = -778610.50 (J)  S = 152.01 (J/K)  V = 24.43 (cc)  Cp = 79.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.13 | 0.83 | 13.63 | 0.57 | 0.00 | 2.32 | 0.17 | 0.38 | 0.00 | 0.00 | 2.25 | 3.17 | 3.70 | 0.17 | 1.68 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.36 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.95Mg0.94Fe"'0.03Ti0.00Al0.12Si1.92O6
G = -138993.01 (J) H = -111123.14 (J) S = 22.24 (J/K) V = 2.94 (cc) Cp = 11.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.87 | 96.19 | 94.68 | 4.72 | -4.44 | 7.40 | 0.32 |

feldspar mass = 22.97 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -381666.84 (J) H = -314773.85 (J) S = 53.38 (J/K) V = 8.82 (cc) Cp = 28.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.31 | 26.66 | 5.03 |

quartz mass = 6.99 (gm) density = 2.55 (gm/cc)
SiO2
G = -116359.92 (J) H = -97097.55 (J) S = 15.37 (J/K) V = 2.74 (cc) Cp = 8.29 (J/K)

Total solids mass = 40.31 (gm) density = 2.78 (gm/cc)
G = -637019.77 (J) H = -522994.54 (J) S = 90.99 (J/K) V = 14.49 (cc) Cp = 48.30 (J/K)

Viscosity of the System: 7.49 (log 10 poise)

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1606124.47 (J) H = -1301605.04 (J) S = 243.00 (J/K) V = 38.92 (cc) Cp = 127.71 (J/K)

Oxygen delta moles = -0.00119598 delta grams = -0.0382699
G = 339.13 (J) H = -37.85 (J) S = -0.30 (J/K) V = -124.61 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 970.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.15 COH = 1.77 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 56.12 (gm) density = 2.44 (gm/cc) viscosity = 6.31 (log 10 poise) (analysis in wt %)
G = -911044.38 (J) H = -733488.46 (J) S = 142.83 (J/K) V = 23.02 (cc) Cp = 74.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.06 | 0.89 | 13.62 | 0.54 | 0.00 | 2.21 | 0.18 | 0.35 | 0.00 | 0.00 | 2.21 | 3.09 | 3.88 | 0.18 | 1.79 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.76 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.92Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -143624.72 (J) H = -115046.34 (J) S = 22.99 (J/K) V = 3.05 (cc) Cp = 12.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.77 | 96.26 | 96.46 | 4.76 | -4.46 | 7.43 | 0.32 |

feldspar mass = 24.97 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.26Al1.26Si2.74O8
G = -414354.66 (J) H = -342496.31 (J) S = 57.80 (J/K) V = 9.58 (cc) Cp = 30.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.29 | 26.40 | 5.31 |

quartz mass = 8.10 (gm) density = 2.55 (gm/cc)
SiO2
G = -134632.58 (J) H = -112589.58 (J) S = 17.73 (J/K) V = 3.17 (cc) Cp = 9.59 (J/K)

Total solids mass = 43.84 (gm) density = 2.77 (gm/cc)
G = -692611.96 (J) H = -570132.23 (J) S = 98.52 (J/K) V = 15.80 (cc) Cp = 52.46 (J/K)

Viscosity of the System: 7.78 (log 10 poise)

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1603656.34 (J) H = -1303620.69 (J) S = 241.35 (J/K) V = 38.82 (cc) Cp = 127.17 (J/K)

Oxygen delta moles = -0.00128237 delta grams = -0.0410343
G = 360.41 (J) H = -40.13 (J) S = -0.32 (J/K) V = -132.54 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 52.93 (gm) density = 2.43 (gm/cc) viscosity = 6.33 (log 10 poise) (analysis in wt %)
G = -858460.06 (J) H = -692593.26 (J) S = 134.51 (J/K) V = 21.74 (cc) Cp = 70.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.99 | 0.94 | 13.62 | 0.52 | 0.00 | 2.09 | 0.19 | 0.32 | 0.00 | 0.00 | 2.18 | 3.01 | 4.05 | 0.19 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.13 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.90Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -147708.38 (J) H = -118555.81 (J) S = 23.64 (J/K) V = 3.14 (cc) Cp = 12.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.45 | 96.33 | 98.05 | 4.79 | -4.48 | 7.45 | 0.31 |

feldspar mass = 26.79 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -443882.87 (J) H = -367722.95 (J) S = 61.76 (J/K) V = 10.28 (cc) Cp = 32.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.24 | 26.16 | 5.60 |

quartz mass = 9.11 (gm) density = 2.55 (gm/cc)
SiO2
G = -151156.05 (J) H = -126681.83 (J) S = 19.85 (J/K) V = 3.57 (cc) Cp = 10.77 (J/K)

Total solids mass = 47.03 (gm) density = 2.77 (gm/cc)
G = -742747.31 (J) H = -612960.60 (J) S = 105.25 (J/K) V = 16.99 (cc) Cp = 56.22 (J/K)

Viscosity of the System: 8.15 (log 10 poise)

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1601207.36 (J) H = -1305553.87 (J) S = 239.75 (J/K) V = 38.73 (cc) Cp = 126.67 (J/K)

Oxygen delta moles = -0.00136346 delta grams = -0.0436291
G = 379.78 (J) H = -42.17 (J) S = -0.34 (J/K) V = -139.79 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 50.02 (gm) density = 2.43 (gm/cc) viscosity = 6.34 (log 10 poise) (analysis in wt %)
G = -810642.62 (J) H = -655376.04 (J) S = 126.94 (J/K) V = 20.58 (cc) Cp = 66.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.91 | 0.99 | 13.62 | 0.50 | 0.00 | 1.97 | 0.20 | 0.30 | 0.00 | 0.00 | 2.14 | 2.93 | 4.23 | 0.20 | 2.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.46 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.89Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -151300.08 (J) H = -121693.72 (J) S = 24.21 (J/K) V = 3.23 (cc) Cp = 13.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.93 | 96.39 | 99.46 | 4.83 | -4.50 | 7.45 | 0.31 |

feldspar mass = 28.45 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -470659.51 (J) H = -390775.12 (J) S = 65.31 (J/K) V = 10.92 (cc) Cp = 34.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.17 | 25.94 | 5.89 |

quartz mass = 10.02 (gm) density = 2.55 (gm/cc)
SiO2
G = -166174.71 (J) H = -139570.02 (J) S = 21.75 (J/K) V = 3.92 (cc) Cp = 11.85 (J/K)

Total solids mass = 49.93 (gm) density = 2.76 (gm/cc)
G = -788134.30 (J) H = -652038.86 (J) S = 111.27 (J/K) V = 18.07 (cc) Cp = 59.62 (J/K)

Viscosity of the System: 8.72 (log 10 poise)

System mass = 99.95 (gm) density = 2.59 (gm/cc)
G = -1598776.92 (J) H = -1307414.90 (J) S = 238.21 (J/K) V = 38.65 (cc) Cp = 126.20 (J/K)

Oxygen delta moles = -0.00143939 delta grams = -0.0460588
G = 397.31 (J) H = -44.01 (J) S = -0.36 (J/K) V = -146.38 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 47.05 (gm) density = 2.43 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -762206.57 (J) H = -617514.57 (J) S = 119.27 (J/K) V = 19.40 (cc) Cp = 62.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.92 | 0.92 | 13.64 | 0.47 | 0.00 | 1.83 | 0.21 | 0.28 | 0.00 | 0.00 | 2.11 | 2.85 | 4.42 | 0.21 | 2.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.66 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.88Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -153505.01 (J) H = -123757.81 (J) S = 24.52 (J/K) V = 3.28 (cc) Cp = 13.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.76 | 96.42 | 100.33 | 4.82 | -4.51 | 7.40 | 0.30 |

feldspar mass = 30.11 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -497231.22 (J) H = -413756.53 (J) S = 68.81 (J/K) V = 11.55 (cc) Cp = 36.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.98 | 25.77 | 6.25 |

quartz mass = 11.00 (gm) density = 2.55 (gm/cc)
SiO2
G = -182100.79 (J) H = -153276.30 (J) S = 23.76 (J/K) V = 4.31 (cc) Cp = 12.99 (J/K)

rhm-oxide mass = 0.13 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.21Al0.12Ti0.84O3
G = -1335.94 (J) H = -1019.97 (J) S = 0.26 (J/K) V = 0.03 (cc) Cp = 0.13 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.40 | 10.27 | 70.67 | 2.77 | 5.89 |

Total solids mass = 52.90 (gm) density = 2.76 (gm/cc)
G = -834172.96 (J) H = -691810.62 (J) S = 117.35 (J/K) V = 19.17 (cc) Cp = 63.08 (J/K)

Viscosity of the System: 10.81 (log 10 poise)

System mass = 99.95 (gm) density = 2.59 (gm/cc)
G = -1596379.53 (J) H = -1309325.19 (J) S = 236.62 (J/K) V = 38.57 (cc) Cp = 125.71 (J/K)

Oxygen delta moles = -0.00148301 delta grams = -0.0474544
G = 405.64 (J) H = -44.81 (J) S = -0.37 (J/K) V = -149.58 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 44.39 (gm) density = 2.42 (gm/cc) viscosity = 6.36 (log 10 poise) (analysis in wt %)
G = -718715.31 (J) H = -583491.81 (J) S = 112.39 (J/K) V = 18.34 (cc) Cp = 59.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.91 | 0.87 | 13.66 | 0.44 | 0.00 | 1.70 | 0.22 | 0.26 | 0.00 | 0.00 | 2.08 | 2.77 | 4.60 | 0.23 | 2.26 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.85 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.88Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -155468.81 (J) H = -125639.77 (J) S = 24.79 (J/K) V = 3.33 (cc) Cp = 13.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.52 | 96.45 | 101.13 | 4.81 | -4.52 | 7.35 | 0.30 |

feldspar mass = 31.60 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.26Al1.26Si2.74O8
G = -521112.03 (J) H = -434592.40 (J) S = 71.91 (J/K) V = 12.12 (cc) Cp = 38.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.79 | 25.61 | 6.60 |

quartz mass = 11.87 (gm) density = 2.55 (gm/cc)
SiO2
G = -196337.83 (J) H = -165615.40 (J) S = 25.53 (J/K) V = 4.65 (cc) Cp = 14.01 (J/K)

rhm-oxide mass = 0.24 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.20Al0.12Ti0.84O3
G = -2363.17 (J) H = -1809.78 (J) S = 0.46 (J/K) V = 0.05 (cc) Cp = 0.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.24 | 10.16 | 70.94 | 2.90 | 5.76 |

Total solids mass = 55.57 (gm) density = 2.76 (gm/cc)
G = -875281.83 (J) H = -727657.35 (J) S = 122.70 (J/K) V = 20.16 (cc) Cp = 66.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1593997.14 (J) H = -1311149.16 (J) S = 235.09 (J/K) V = 38.50 (cc) Cp = 125.26 (J/K)

Oxygen delta moles = -0.00152766 delta grams = -0.0488834
G = 414.03 (J) H = -45.62 (J) S = -0.38 (J/K) V = -152.82 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 41.95 (gm) density = 2.42 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -678997.26 (J) H = -552382.72 (J) S = 106.12 (J/K) V = 17.37 (cc) Cp = 55.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.88 | 0.82 | 13.68 | 0.42 | 0.00 | 1.57 | 0.23 | 0.24 | 0.00 | 0.00 | 2.05 | 2.69 | 4.78 | 0.24 | 2.39 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.02 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.87Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -157137.67 (J) H = -127296.24 (J) S = 25.01 (J/K) V = 3.37 (cc) Cp = 13.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.18 | 96.49 | 101.83 | 4.80 | -4.52 | 7.28 | 0.29 |

feldspar mass = 32.98 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -542899.75 (J) H = -453767.45 (J) S = 74.70 (J/K) V = 12.65 (cc) Cp = 40.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.58 | 25.45 | 6.97 |

quartz mass = 12.68 (gm) density = 2.55 (gm/cc)
SiO2
G = -209341.03 (J) H = -176962.87 (J) S = 27.14 (J/K) V = 4.96 (cc) Cp = 14.95 (J/K)

rhm-oxide mass = 0.33 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'''0.20Al0.11Ti0.84O3
G = -3255.17 (J) H = -2500.61 (J) S = 0.63 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.09 | 10.03 | 71.21 | 3.03 | 5.64 |

Total solids mass = 58.00 (gm) density = 2.75 (gm/cc)
G = -912633.62 (J) H = -760527.18 (J) S = 127.48 (J/K) V = 21.06 (cc) Cp = 68.99 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1591630.88 (J) H = -1312909.90 (J) S = 233.60 (J/K) V = 38.43 (cc) Cp = 124.85 (J/K)

Oxygen delta moles = -0.00157043 delta grams = -0.0502517
G = 421.70 (J) H = -46.34 (J) S = -0.39 (J/K) V = -155.79 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 39.72 (gm) density = 2.41 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -642527.92 (J) H = -523779.42 (J) S = 100.37 (J/K) V = 16.48 (cc) Cp = 52.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.83 | 0.78 | 13.70 | 0.39 | 0.00 | 1.46 | 0.24 | 0.23 | 0.00 | 0.00 | 2.02 | 2.62 | 4.95 | 0.25 | 2.53 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.16 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.86Fe'''0.03Ti0.00Al0.12Si1.93O6
G = -158551.29 (J) H = -128757.09 (J) S = 25.18 (J/K) V = 3.41 (cc) Cp = 13.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.75 | 96.52 | 102.46 | 4.80 | -4.53 | 7.22 | 0.29 |

feldspar mass = 34.24 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.67Ca0.25Al1.25Si2.75O8
G = -562885.66 (J) H = -471513.98 (J) S = 77.23 (J/K) V = 13.14 (cc) Cp = 41.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.37 | 25.29 | 7.34 |

quartz mass = 13.42 (gm) density = 2.55 (gm/cc)
SiO2
G = -221282.27 (J) H = -187457.58 (J) S = 28.59 (J/K) V = 5.25 (cc) Cp = 15.81 (J/K)

rhm-oxide mass = 0.41 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.20Al0.11Ti0.85O3
G = -4033.21 (J) H = -3107.95 (J) S = 0.78 (J/K) V = 0.09 (cc) Cp = 0.39 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.95 | 9.89 | 71.47 | 3.16 | 5.52 |

Total solids mass = 60.23 (gm) density = 2.75 (gm/cc)
G = -946752.44 (J) H = -790836.60 (J) S = 131.78 (J/K) V = 21.89 (cc) Cp = 71.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1589280.35 (J) H = -1314616.02 (J) S = 232.15 (J/K) V = 38.36 (cc) Cp = 124.46 (J/K)

Oxygen delta moles = -0.00161133 delta grams = -0.0515608
G = 428.66 (J) H = -46.97 (J) S = -0.40 (J/K) V = -158.51 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 900.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.09 COH = 1.60 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 37.66 (gm) density = 2.41 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -608866.79 (J) H = -497339.11 (J) S = 95.07 (J/K) V = 15.65 (cc) Cp = 50.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.77 | 0.73 | 13.73 | 0.37 | 0.00 | 1.35 | 0.25 | 0.22 | 0.00 | 0.00 | 2.00 | 2.54 | 5.12 | 0.27 | 2.67 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.28 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.86Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -159744.08 (J) H = -130048.19 (J) S = 25.31 (J/K) V = 3.44 (cc) Cp = 13.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.24 | 96.55 | 103.01 | 4.79 | -4.54 | 7.15 | 0.28 |

feldspar mass = 35.42 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -581315.10 (J) H = -488027.87 (J) S = 79.52 (J/K) V = 13.59 (cc) Cp = 42.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.14 | 25.14 | 7.72 |

quartz mass = 14.10 (gm) density = 2.55 (gm/cc)
SiO2
G = -232304.71 (J) H = -197215.21 (J) S = 29.91 (J/K) V = 5.52 (cc) Cp = 16.60 (J/K)

rhm-oxide mass = 0.48 (gm) density = 4.63 (gm/cc) (analysis in mole %)

Mn0.03Fe"0.72Mg0.10Fe'''0.19Al0.11Ti0.85O3
G = -4714.53 (J) H = -3644.36 (J) S = 0.91 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.82 | 9.75 | 71.73 | 3.29 | 5.41 |

Total solids mass = 62.29 (gm) density = 2.75 (gm/cc)
G = -978078.42 (J) H = -818935.62 (J) S = 135.65 (J/K) V = 22.65 (cc) Cp = 73.93 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1586945.21 (J) H = -1316274.74 (J) S = 230.72 (J/K) V = 38.30 (cc) Cp = 124.09 (J/K)

Oxygen delta moles = -0.00165044 delta grams = -0.0528121
G = 434.95 (J) H = -47.52 (J) S = -0.41 (J/K) V = -160.98 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 35.75 (gm) density = 2.40 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -577640.80 (J) H = -472771.13 (J) S = 90.16 (J/K) V = 14.88 (cc) Cp = 47.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.69 | 0.69 | 13.75 | 0.34 | 0.00 | 1.24 | 0.26 | 0.20 | 0.00 | 0.00 | 1.97 | 2.47 | 5.28 | 0.28 | 2.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.39 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.86Fe'''0.03Ti0.00Al0.12Si1.93O6
G = -160745.79 (J) H = -131191.94 (J) S = 25.41 (J/K) V = 3.47 (cc) Cp = 14.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.67 | 96.59 | 103.50 | 4.79 | -4.55 | 7.08 | 0.28 |

feldspar mass = 36.52 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -598396.71 (J) H = -503475.93 (J) S = 81.61 (J/K) V = 14.00 (cc) Cp = 44.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.90 | 24.99 | 8.11 |

quartz mass = 14.74 (gm) density = 2.55 (gm/cc)
SiO2
G = -242528.63 (J) H = -206333.07 (J) S = 31.12 (J/K) V = 5.77 (cc) Cp = 17.34 (J/K)

rhm-oxide mass = 0.54 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe'''0.19Al0.11Ti0.85O3
G = -5313.24 (J) H = -4120.08 (J) S = 1.03 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.70 | 9.60 | 71.99 | 3.41 | 5.30 |

Total solids mass = 64.19 (gm) density = 2.75 (gm/cc)

G = -1006984.36 (J)  H = -845121.02 (J)  S = 139.16 (J/K)  V = 23.36 (cc)  Cp = 76.11 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.61 (gm/cc)
G = -1584625.16 (J)  H = -1317892.15 (J)  S = 229.32 (J/K)  V = 38.25 (cc)  Cp = 123.75 (J/K)

Oxygen  delta moles = -0.0016878  delta grams = -0.0540076
G = 440.59 (J)  H = -48.00 (J)  S = -0.42 (J/K)  V = -163.22 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 880.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.26  delta HM = -5.06  NNO = 0.00  QFM = 0.07  COH = 1.54  IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid  mass = 33.97 (gm)  density = 2.40 (gm/cc)  viscosity = 6.36 (log 10 poise)  (analysis in wt %)
G = -548531.24 (J)  H = -449826.79 (J)  S = 85.60 (J/K)  V = 14.17 (cc)  Cp = 45.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.60 | 0.65 | 13.78 | 0.32 | 0.00 | 1.15 | 0.27 | 0.19 | 0.00 | 0.00 | 1.95 | 2.40 | 5.44 | 0.30 | 2.96 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.49 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.85Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -161582.11 (J)  H = -132207.72 (J)  S = 25.47 (J/K)  V = 3.49 (cc)  Cp = 14.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.05 | 96.62 | 103.93 | 4.78 | -4.55 | 7.00 | 0.27 |

feldspar  mass = 37.55 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.67Ca0.25Al1.25Si2.75O8
G = -614309.56 (J)  H = -518001.58 (J)  S = 83.52 (J/K)  V = 14.40 (cc)  Cp = 45.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.64 | 24.85 | 8.51 |

quartz  mass = 15.34 (gm)  density = 2.55 (gm/cc)
SiO2
G = -252056.05 (J)  H = -214893.76 (J)  S = 32.23 (J/K)  V = 6.01 (cc)  Cp = 18.02 (J/K)

rhm-oxide  mass = 0.59 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.19Al0.10Ti0.85O3
G = -5840.97 (J)  H = -4543.60 (J)  S = 1.13 (J/K)  V = 0.13 (cc)  Cp = 0.56 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.59 | 9.44 | 72.25 | 3.53 | 5.20 |

Total solids  mass = 65.97 (gm)  density = 2.75 (gm/cc)
G = -1033788.69 (J)  H = -869646.65 (J)  S = 142.34 (J/K)  V = 24.03 (cc)  Cp = 78.14 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.62 (gm/cc)
G = -1582319.94 (J)  H = -1319473.45 (J)  S = 227.94 (J/K)  V = 38.20 (cc)  Cp = 123.42 (J/K)

Oxygen delta moles = -0.00172349 delta grams = -0.0551495
G = 445.62 (J) H = -48.40 (J) S = -0.43 (J/K) V = -165.24 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 32.30 (gm) density = 2.39 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -521263.46 (J) H = -428291.36 (J) S = 81.33 (J/K) V = 13.50 (cc) Cp = 43.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.49 | 0.61 | 13.81 | 0.30 | 0.00 | 1.06 | 0.28 | 0.18 | 0.00 | 0.00 | 1.94 | 2.33 | 5.59 | 0.31 | 3.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.57 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.85Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -162275.29 (J) H = -133112.30 (J) S = 25.51 (J/K) V = 3.52 (cc) Cp = 14.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.38 | 96.65 | 104.32 | 4.78 | -4.56 | 6.93 | 0.27 |

feldspar mass = 38.52 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -629208.85 (J) H = -531729.40 (J) S = 85.27 (J/K) V = 14.77 (cc) Cp = 46.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.37 | 24.71 | 8.92 |

quartz mass = 15.90 (gm) density = 2.55 (gm/cc)
SiO2
G = -260974.36 (J) H = -222968.08 (J) S = 33.25 (J/K) V = 6.23 (cc) Cp = 18.67 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.19Al0.10Ti0.86O3
G = -6307.38 (J) H = -4921.91 (J) S = 1.21 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.48 | 9.27 | 72.51 | 3.65 | 5.10 |

Total solids mass = 67.64 (gm) density = 2.74 (gm/cc)
G = -1058765.87 (J) H = -892731.68 (J) S = 145.24 (J/K) V = 24.65 (cc) Cp = 80.04 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.62 (gm/cc)
G = -1580029.33 (J) H = -1321023.04 (J) S = 226.57 (J/K) V = 38.15 (cc) Cp = 123.11 (J/K)

Oxygen delta moles = -0.00175756 delta grams = -0.0562399
G = 450.06 (J) H = -48.74 (J) S = -0.44 (J/K) V = -167.05 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 860.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.64  delta HM = -5.08  NNO = 0.00  QFM = 0.06  COH = 1.48  IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid  mass = 30.73 (gm)  density = 2.39 (gm/cc)  viscosity = 6.34 (log 10 poise)  (analysis in wt %)
G = -495598.58 (J)  H = -407977.62 (J)  S = 77.33 (J/K)  V = 12.86 (cc)  Cp = 41.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.36 | 0.58 | 13.84 | 0.28 | 0.00 | 0.98 | 0.29 | 0.17 | 0.00 | 0.00 | 1.92 | 2.26 | 5.73 | 0.33 | 3.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.64 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.85Fe"'0.02Ti0.00Al0.12Si1.93O6
G = -162844.54 (J)  H = -133920.22 (J)  S = 25.53 (J/K)  V = 3.53 (cc)  Cp = 14.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.68 | 96.69 | 104.66 | 4.78 | -4.57 | 6.86 | 0.26 |

feldspar  mass = 39.44 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -643230.42 (J)  H = -544768.70 (J)  S = 86.89 (J/K)  V = 15.12 (cc)  Cp = 47.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.09 | 24.56 | 9.35 |

quartz  mass = 16.44 (gm)  density = 2.55 (gm/cc)
SiO2
G = -269359.08 (J)  H = -230617.36 (J)  S = 34.19 (J/K)  V = 6.44 (cc)  Cp = 19.27 (J/K)

rhm-oxide  mass = 0.69 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe"'0.18Al0.10Ti0.86O3
G = -6720.53 (J)  H = -5260.88 (J)  S = 1.29 (J/K)  V = 0.15 (cc)  Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.37 | 9.11 | 72.76 | 3.76 | 5.00 |

Total solids  mass = 69.21 (gm)  density = 2.74 (gm/cc)
G = -1082154.57 (J)  H = -914567.15 (J)  S = 147.90 (J/K)  V = 25.24 (cc)  Cp = 81.82 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.62 (gm/cc)
G = -1577753.14 (J)  H = -1322544.77 (J)  S = 225.22 (J/K)  V = 38.10 (cc)  Cp = 122.82 (J/K)

Oxygen  delta moles = -0.0017901  delta grams = -0.0572811
G = 453.95 (J)  H = -49.00 (J)  S = -0.44 (J/K)  V = -168.65 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 850.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.84  delta HM = -5.08  NNO = 0.00  QFM = 0.05  COH = 1.46  IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 29.25 (gm) density = 2.39 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -471326.85 (J) H = -388720.65 (J) S = 73.55 (J/K) V = 12.26 (cc) Cp = 39.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.22 | 0.54 | 13.87 | 0.27 | 0.00 | 0.90 | 0.30 | 0.16 | 0.00 | 0.00 | 1.91 | 2.19 | 5.87 | 0.34 | 3.43 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.71 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.85Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -163306.48 (J) H = -134644.08 (J) S = 25.52 (J/K) V = 3.55 (cc) Cp = 14.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.94 | 96.73 | 104.97 | 4.78 | -4.59 | 6.79 | 0.26 |

feldspar mass = 40.32 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.66Ca0.24Al1.24Si2.76O8
G = -656494.41 (J) H = -557216.47 (J) S = 88.39 (J/K) V = 15.46 (cc) Cp = 48.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.79 | 24.42 | 9.79 |

quartz mass = 16.94 (gm) density = 2.55 (gm/cc)
SiO2
G = -277276.28 (J) H = -237895.32 (J) S = 35.06 (J/K) V = 6.63 (cc) Cp = 19.84 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.18Al0.10Ti0.86O3
G = -7087.20 (J) H = -5565.44 (J) S = 1.35 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.26 | 8.94 | 73.02 | 3.87 | 4.91 |

Total solids mass = 70.69 (gm) density = 2.74 (gm/cc)
G = -1104164.37 (J) H = -935321.30 (J) S = 150.33 (J/K) V = 25.79 (cc) Cp = 83.50 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1575491.22 (J) H = -1324041.96 (J) S = 223.88 (J/K) V = 38.05 (cc) Cp = 122.54 (J/K)

Oxygen delta moles = -0.00182118 delta grams = -0.0582754
G = 457.32 (J) H = -49.21 (J) S = -0.45 (J/K) V = -170.07 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 27.84 (gm) density = 2.38 (gm/cc) viscosity = 6.29 (log 10 poise) (analysis in wt %)
G = -448262.15 (J) H = -370373.55 (J) S = 69.97 (J/K) V = 11.69 (cc) Cp = 37.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.51 | 13.91 | 0.25 | 0.00 | 0.83 | 0.31 | 0.15 | 0.00 | 0.00 | 1.90 | 2.13 | 5.99 | 0.36 | 3.61 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.76 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -163675.57 (J) H = -135294.85 (J) S = 25.50 (J/K) V = 3.56 (cc) Cp = 14.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.17 | 96.77 | 105.24 | 4.79 | -4.60 | 6.73 | 0.25 |

feldspar mass = 41.16 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.65Ca0.24Al1.24Si2.76O8
G = -669108.22 (J) H = -569159.80 (J) S = 89.79 (J/K) V = 15.78 (cc) Cp = 49.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.47 | 24.28 | 10.25 |

quartz mass = 17.42 (gm) density = 2.55 (gm/cc)
SiO2
G = -284784.36 (J) H = -244849.59 (J) S = 35.88 (J/K) V = 6.82 (cc) Cp = 20.38 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.18Al0.10Ti0.86O3
G = -7413.13 (J) H = -5839.75 (J) S = 1.41 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.16 | 8.77 | 73.28 | 3.97 | 4.82 |

Total solids mass = 72.10 (gm) density = 2.74 (gm/cc)
G = -1124981.28 (J) H = -955143.99 (J) S = 152.57 (J/K) V = 26.32 (cc) Cp = 85.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1573243.44 (J) H = -1325517.54 (J) S = 222.54 (J/K) V = 38.01 (cc) Cp = 122.28 (J/K)

Oxygen delta moles = -0.00185086 delta grams = -0.0592252
G = 460.19 (J) H = -49.36 (J) S = -0.46 (J/K) V = -171.30 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 25.94 (gm) density = 2.38 (gm/cc) viscosity = 6.20 (log 10 poise) (analysis in wt %)
G = -417674.03 (J) H = -345577.82 (J) S = 65.35 (J/K) V = 10.91 (cc) Cp = 34.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.86 | 0.46 | 13.91 | 0.24 | 0.00 | 0.79 | 0.33 | 0.15 | 0.00 | 0.00 | 1.91 | 2.14 | 5.95 | 0.39 | 3.87 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.80 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -163883.82 (J) H = -135818.95 (J) S = 25.44 (J/K) V = 3.57 (cc) Cp = 14.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.40 | 96.84 | 105.43 | 4.84 | -4.66 | 6.71 | 0.25 |

feldspar mass = 41.05 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.65Ca0.25Al1.25Si2.75O8
G = -666666.34 (J) H = -568373.11 (J) S = 89.10 (J/K) V = 15.73 (cc) Cp = 49.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.45 | 24.66 | 9.89 |

feldspar mass = 1.33 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.31Ca0.03Al1.03Si2.97O8
G = -20898.86 (J) H = -17770.46 (J) S = 2.84 (J/K) V = 0.52 (cc) Cp = 1.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.10 | 2.57 | 66.33 |

quartz mass = 18.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -294086.00 (J) H = -253375.64 (J) S = 36.90 (J/K) V = 7.05 (cc) Cp = 21.05 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'''0.17Al0.10Ti0.87O3
G = -7802.44 (J) H = -6166.14 (J) S = 1.48 (J/K) V = 0.17 (cc) Cp = 0.75 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.07 | 8.59 | 73.53 | 4.05 | 4.76 |

Total solids mass = 74.00 (gm) density = 2.74 (gm/cc)
G = -1153337.47 (J) H = -981504.31 (J) S = 155.77 (J/K) V = 27.04 (cc) Cp = 87.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1571011.50 (J) H = -1327082.13 (J) S = 221.12 (J/K) V = 37.96 (cc) Cp = 121.97 (J/K)

Oxygen delta moles = -0.0018765 delta grams = -0.0600458
G = 461.93 (J) H = -49.38 (J) S = -0.46 (J/K) V = -172.11 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 820.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.02 COH = 1.37 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 24.06 (gm) density = 2.37 (gm/cc) viscosity = 6.08 (log 10 poise) (analysis in wt %)
G = -387310.99 (J) H = -320843.05 (J) S = 60.80 (J/K) V = 10.15 (cc) Cp = 32.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.63 | 0.42 | 13.92 | 0.23 | 0.00 | 0.75 | 0.35 | 0.14 | 0.00 | 0.00 | 1.93 | 2.17 | 5.87 | 0.42 | 4.18 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.83 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.84Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -164023.25 (J) H = -136288.16 (J) S = 25.37 (J/K) V = 3.58 (cc) Cp = 14.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.62 | 96.92 | 105.59 | 4.90 | -4.73 | 6.70 | 0.24 |

feldspar mass = 40.81 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.25Al1.25Si2.75O8
G = -661934.87 (J) H = -565629.50 (J) S = 88.10 (J/K) V = 15.62 (cc) Cp = 49.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.50 | 25.13 | 9.38 |

feldspar mass = 2.80 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.30Ca0.02Al1.02Si2.98O8
G = -44071.74 (J) H = -37559.41 (J) S = 5.96 (J/K) V = 1.10 (cc) Cp = 3.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.16 | 2.41 | 67.43 |

quartz mass = 18.60 (gm) density = 2.55 (gm/cc)
SiO2
G = -303298.48 (J) H = -261857.60 (J) S = 37.91 (J/K) V = 7.28 (cc) Cp = 21.72 (J/K)

rhm-oxide mass = 0.84 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.17Al0.09Ti0.87O3
G = -8155.30 (J) H = -6465.68 (J) S = 1.55 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.98 | 8.40 | 73.79 | 4.12 | 4.71 |

Total solids mass = 75.88 (gm) density = 2.73 (gm/cc)
G = -1181483.64 (J) H = -1007800.35 (J) S = 158.88 (J/K) V = 27.77 (cc) Cp = 89.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1568794.63 (J) H = -1328643.39 (J) S = 219.69 (J/K) V = 37.91 (cc) Cp = 121.66 (J/K)

Oxygen delta moles = -0.00190087 delta grams = -0.0608257
G = 463.24 (J) H = -49.35 (J) S = -0.47 (J/K) V = -172.77 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 22.29 (gm) density = 2.36 (gm/cc) viscosity = 5.95 (log 10 poise) (analysis in wt %)
G = -358965.73 (J) H = -297691.78 (J) S = 56.57 (J/K) V = 9.43 (cc) Cp = 29.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.35 | 0.38 | 13.92 | 0.22 | 0.00 | 0.71 | 0.37 | 0.14 | 0.00 | 0.00 | 1.95 | 2.21 | 5.78 | 0.45 | 4.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.86 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -164122.37 (J) H = -136724.80 (J) S = 25.29 (J/K) V = 3.58 (cc) Cp = 14.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.85 | 97.01 | 105.74 | 4.97 | -4.81 | 6.71 | 0.24 |

feldspar mass = 40.62 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.26Al1.26Si2.74O8
G = -658179.42 (J) H = -563699.04 (J) S = 87.23 (J/K) V = 15.54 (cc) Cp = 49.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.56 | 25.55 | 8.90 |

feldspar mass = 4.14 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.29Ca0.02Al1.02Si2.98O8
G = -64876.59 (J) H = -55414.92 (J) S = 8.74 (J/K) V = 1.63 (cc) Cp = 4.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.26 | 2.25 | 68.48 |

quartz mass = 19.16 (gm) density = 2.55 (gm/cc)
SiO2
G = -311993.83 (J) H = -269924.64 (J) S = 38.84 (J/K) V = 7.50 (cc) Cp = 22.34 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.16Al0.09Ti0.87O3
G = -8454.43 (J) H = -6724.26 (J) S = 1.60 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.89 | 8.21 | 74.06 | 4.18 | 4.66 |

Total solids mass = 77.65 (gm) density = 2.73 (gm/cc)
G = -1207626.64 (J) H = -1032487.67 (J) S = 161.69 (J/K) V = 28.44 (cc) Cp = 91.44 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1566592.37 (J) H = -1330179.45 (J) S = 218.26 (J/K) V = 37.87 (cc) Cp = 121.39 (J/K)

Oxygen delta moles = -0.00192466 delta grams = -0.0615868
G = 464.29 (J) H = -49.29 (J) S = -0.47 (J/K) V = -173.33 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 20.64 (gm) density = 2.36 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -332335.14 (J) H = -275879.75 (J) S = 52.61 (J/K) V = 8.75 (cc) Cp = 27.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.03 | 0.35 | 13.93 | 0.22 | 0.00 | 0.68 | 0.40 | 0.13 | 0.00 | 0.00 | 1.98 | 2.26 | 5.67 | 0.49 | 4.87 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.89 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -164187.95 (J) H = -137134.24 (J) S = 25.21 (J/K) V = 3.59 (cc) Cp = 14.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.08 | 97.10 | 105.88 | 5.04 | -4.89 | 6.72 | 0.23 |

feldspar mass = 40.48 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.26Al1.26Si2.74O8
G = -655199.18 (J) H = -562415.61 (J) S = 86.46 (J/K) V = 15.47 (cc) Cp = 48.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.61 | 25.94 | 8.45 |

feldspar mass = 5.35 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.28Ca0.02Al1.02Si2.98O8
G = -83708.52 (J) H = -71661.53 (J) S = 11.23 (J/K) V = 2.11 (cc) Cp = 6.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.39 | 2.11 | 69.50 |

quartz mass = 19.69 (gm) density = 2.55 (gm/cc)
SiO2
G = -320266.43 (J) H = -277655.72 (J) S = 39.71 (J/K) V = 7.71 (cc) Cp = 22.94 (J/K)

rhm-oxide mass = 0.90 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.16Al0.09Ti0.87O3
G = -8707.40 (J) H = -6947.52 (J) S = 1.64 (J/K) V = 0.19 (cc) Cp = 0.83 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.80 | 8.02 | 74.33 | 4.23 | 4.62 |

Total solids mass = 79.30 (gm) density = 2.73 (gm/cc)
G = -1232069.49 (J) H = -1055814.63 (J) S = 164.24 (J/K) V = 29.07 (cc) Cp = 93.34 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1564404.63 (J) H = -1331694.38 (J) S = 216.85 (J/K) V = 37.82 (cc) Cp = 121.14 (J/K)

Oxygen delta moles = -0.00194785 delta grams = -0.0623289
G = 465.09 (J) H = -49.20 (J) S = -0.48 (J/K) V = -173.80 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 19.07 (gm) density = 2.35 (gm/cc) viscosity = 5.65 (log 10 poise) (analysis in wt %)
G = -307139.39 (J) H = -255179.99 (J) S = 48.87 (J/K) V = 8.11 (cc) Cp = 25.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.66 | 0.31 | 13.94 | 0.21 | 0.00 | 0.65 | 0.43 | 0.13 | 0.00 | 0.00 | 2.01 | 2.32 | 5.55 | 0.53 | 5.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.91 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -164226.05 (J) H = -137521.31 (J) S = 25.12 (J/K) V = 3.59 (cc) Cp = 14.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.32 | 97.21 | 106.01 | 5.13 | -4.97 | 6.73 | 0.23 |

feldspar mass = 40.37 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.26Al1.26Si2.74O8
G = -652844.91 (J) H = -561655.82 (J) S = 85.77 (J/K) V = 15.42 (cc) Cp = 48.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.68 | 26.30 | 8.02 |

feldspar mass = 6.46 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.28Ca0.02Al1.02Si2.98O8
G = -100893.30 (J) H = -86567.30 (J) S = 13.48 (J/K) V = 2.54 (cc) Cp = 7.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.55 | 1.98 | 70.47 |

quartz mass = 20.20 (gm) density = 2.55 (gm/cc)
SiO2
G = -328207.06 (J) H = -285127.34 (J) S = 40.52 (J/K) V = 7.91 (cc) Cp = 23.51 (J/K)

rhm-oxide mass = 0.93 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.09Fe'"0.16Al0.09Ti0.88O3
G = -8920.66 (J) H = -7140.28 (J) S = 1.67 (J/K) V = 0.20 (cc) Cp = 0.85 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.71 | 7.83 | 74.62 | 4.26 | 4.57 |

Total solids mass = 80.87 (gm) density = 2.73 (gm/cc)
G = -1255091.98 (J) H = -1078012.06 (J) S = 166.56 (J/K) V = 29.67 (cc) Cp = 95.16 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1562231.37 (J) H = -1333192.04 (J) S = 215.43 (J/K) V = 37.78 (cc) Cp = 120.92 (J/K)

Oxygen delta moles = -0.00197046 delta grams = -0.0630522
G = 465.64 (J) H = -49.08 (J) S = -0.48 (J/K) V = -174.18 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 780.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.02 COH = 1.24 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 17.04 (gm) density = 2.33 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -274797.41 (J) H = -228187.73 (J) S = 44.26 (J/K) V = 7.30 (cc) Cp = 23.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.47 | 0.27 | 13.34 | 0.19 | 0.00 | 0.58 | 0.49 | 0.14 | 0.00 | 0.00 | 2.00 | 2.83 | 5.19 | 0.59 | 5.89 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.63 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -61787.26 (J) H = -52626.05 (J) S = 8.70 (J/K) V = 1.17 (cc) Cp = 4.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.96 | 17.81 | 22.23 |

orthopyroxene mass = 9.77 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.92Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -126299.91 (J) H = -106310.17 (J) S = 18.98 (J/K) V = 2.74 (cc) Cp = 11.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.92 | 97.05 | 98.91 | 4.38 | -4.24 | 5.57 | 0.25 |

clinopyroxene mass = 0.73 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.28Mg0.31Fe'"0.05Ti0.40Al0.75Si1.23O6
G = -10543.60 (J) H = -9098.10 (J) S = 1.37 (J/K) V = 0.20 (cc) Cp = 0.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.59 | 1.69 | 27.98 | 71.91 | 7.77 | -3.03 | 6.26 |

feldspar mass = 37.37 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.68Ca0.23Al1.23Si2.77O8
G = -603203.60 (J) H = -519908.92 (J) S = 79.09 (J/K) V = 14.31 (cc) Cp = 45.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.32 | 23.21 | 8.47 |

feldspar mass = 8.12 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -126763.61 (J) H = -108998.64 (J) S = 16.87 (J/K) V = 3.20 (cc) Cp = 9.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.87 | 1.81 | 69.32 |

quartz mass = 21.54 (gm) density = 2.55 (gm/cc)
SiO2
G = -349492.39 (J) H = -304243.59 (J) S = 42.97 (J/K) V = 8.43 (cc) Cp = 25.03 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.10Fe'"0.14Al0.09Ti0.89O3
G = -7122.93 (J) H = -5726.93 (J) S = 1.33 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.86 | 7.11 | 74.02 | 4.69 | 4.31 |

Total solids mass = 82.89 (gm) density = 2.74 (gm/cc)
G = -1285213.30 (J) H = -1106912.39 (J) S = 169.30 (J/K) V = 30.21 (cc) Cp = 97.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.66 (gm/cc)
G = -1560010.71 (J) H = -1335100.12 (J) S = 213.56 (J/K) V = 37.51 (cc) Cp = 120.42 (J/K)

Oxygen delta moles = -0.00212572 delta grams = -0.0680206
G = 497.11 (J) H = -52.20 (J) S = -0.52 (J/K) V = -186.13 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 15.49 (gm) density = 2.32 (gm/cc) viscosity = 5.03 (log 10 poise) (analysis in wt %)
G = -249890.86 (J) H = -207500.54 (J) S = 40.64 (J/K) V = 6.66 (cc) Cp = 21.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.93 | 0.24 | 13.23 | 0.19 | 0.00 | 0.55 | 0.55 | 0.14 | 0.00 | 0.00 | 2.02 | 3.06 | 4.96 | 0.65 | 6.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.76 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.23)3Al2Si3O12
G = -76776.95 (J) H = -65548.99 (J) S = 10.76 (J/K) V = 1.46 (cc) Cp = 6.16 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.81 | 17.53 | 22.66 |

orthopyroxene mass = 9.00 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.97Mg0.94Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -116758.13 (J) H = -98593.76 (J) S = 17.41 (J/K) V = 2.53 (cc) Cp = 10.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.01 | 97.16 | 97.13 | 4.28 | -4.15 | 5.34 | 0.25 |

clinopyroxene mass = 1.06 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.27Mg0.31Fe'"0.04Ti0.40Al0.76Si1.22O6
G = -15278.70 (J) H = -13218.89 (J) S = 1.97 (J/K) V = 0.30 (cc) Cp = 1.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.63 | 1.61 | 27.08 | 73.21 | 7.78 | -3.44 | 6.40 |

feldspar mass = 36.47 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.22Al1.22Si2.78O8
G = -587996.45 (J) H = -507873.20 (J) S = 76.81 (J/K) V = 13.97 (cc) Cp = 44.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.27 | 22.40 | 8.33 |

feldspar mass = 9.24 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.02Al1.02Si2.98O8
G = -144055.43 (J) H = -124140.77 (J) S = 19.09 (J/K) V = 3.64 (cc) Cp = 10.90 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.72 | 1.67 | 69.61 |

quartz mass = 22.26 (gm) density = 2.55 (gm/cc)
SiO2
G = -360752.83 (J) H = -314690.18 (J) S = 44.16 (J/K) V = 8.72 (cc) Cp = 25.84 (J/K)

rhm-oxide mass = 0.66 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.10Fe'"0.14Al0.08Ti0.89O3
G = -6347.33 (J) H = -5121.20 (J) S = 1.18 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.12 | 6.81 | 73.98 | 4.84 | 4.25 |

Total solids mass = 84.45 (gm) density = 2.75 (gm/cc)
G = -1307965.82 (J) H = -1129187.00 (J) S = 171.38 (J/K) V = 30.74 (cc) Cp = 99.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.67 (gm/cc)
G = -1557856.68 (J) H = -1336687.54 (J) S = 212.02 (J/K) V = 37.41 (cc) Cp = 120.21 (J/K)

Oxygen delta moles = -0.00217574 delta grams = -0.0696209
G = 503.47 (J) H = -52.67 (J) S = -0.53 (J/K) V = -188.70 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 13.08 (gm) density = 2.31 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -211182.55 (J) H = -175134.36 (J) S = 34.89 (J/K) V = 5.67 (cc) Cp = 17.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.25 | 0.19 | 12.65 | 0.20 | 0.00 | 0.58 | 0.65 | 0.13 | 0.00 | 0.00 | 2.14 | 3.56 | 4.58 | 0.77 | 7.29 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.06 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -107054.66 (J) H = -91582.72 (J) S = 14.98 (J/K) V = 2.04 (cc) Cp = 8.60 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.73 | 17.80 | 21.47 |

orthopyroxene mass = 6.54 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.92Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -84191.38 (J) H = -71209.67 (J) S = 12.57 (J/K) V = 1.83 (cc) Cp = 7.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.68 | 97.28 | 99.82 | 4.13 | -4.01 | 5.21 | 0.25 |

clinopyroxene mass = 1.28 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.28Mg0.30Fe'"0.04Ti0.40Al0.75Si1.23O6
G = -18494.27 (J) H = -16029.44 (J) S = 2.39 (J/K) V = 0.36 (cc) Cp = 1.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.83 | 1.52 | 27.99 | 72.09 | 8.22 | -3.79 | 6.80 |

biotite mass = 1.19 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -18694.06 (J) H = -16050.26 (J) S = 2.56 (J/K) V = 0.43 (cc) Cp = 1.49 (J/K)

| annite | phlogopite |
|---|---|
| 5.63 | 94.37 |

feldspar mass = 35.59 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -572916.13 (J) H = -495858.46 (J) S = 74.59 (J/K) V = 13.64 (cc) Cp = 43.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.68 | 20.95 | 8.37 |

feldspar mass = 9.64 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -150196.47 (J) H = -129716.03 (J) S = 19.82 (J/K) V = 3.80 (cc) Cp = 11.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.98 | 1.53 | 69.49 |

quartz mass = 23.91 (gm) density = 2.55 (gm/cc)
SiO2
G = -387030.12 (J) H = -338302.25 (J) S = 47.16 (J/K) V = 9.36 (cc) Cp = 27.72 (J/K)

rhm-oxide mass = 0.62 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.10Fe'''0.14Al0.08Ti0.89O3
G = -5968.88 (J) H = -4826.69 (J) S = 1.11 (J/K) V = 0.13 (cc) Cp = 0.57 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.56 | 6.92 | 74.54 | 5.00 | 3.99 |

Total solids mass = 86.85 (gm) density = 2.75 (gm/cc)
G = -1344545.97 (J) H = -1163575.53 (J) S = 175.16 (J/K) V = 31.59 (cc) Cp = 101.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.68 (gm/cc)
G = -1555728.52 (J) H = -1338709.90 (J) S = 210.06 (J/K) V = 37.26 (cc) Cp = 119.86 (J/K)

Oxygen delta moles = -0.00220851 delta grams = -0.0706696
G = 505.65 (J) H = -52.69 (J) S = -0.54 (J/K) V = -189.71 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 10.48 (gm) density = 2.29 (gm/cc) viscosity = 4.10 (log 10 poise) (analysis in wt %)
G = -169297.59 (J) H = -140066.29 (J) S = 28.57 (J/K) V = 4.58 (cc) Cp = 14.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.23 | 0.15 | 11.89 | 0.24 | 0.00 | 0.64 | 0.74 | 0.12 | 0.00 | 0.00 | 2.33 | 4.27 | 4.10 | 0.96 | 8.34 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.44 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -150869.26 (J) H = -129296.39 (J) S = 21.08 (J/K) V = 2.88 (cc) Cp = 12.15 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.24 | 17.99 | 19.77 |

orthopyroxene mass = 2.30 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.88Fe'''0.01Ti0.00Al0.09Si1.95O6
G = -29258.55 (J) H = -24770.68 (J) S = 4.39 (J/K) V = 0.64 (cc) Cp = 2.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.48 | 97.46 | 104.51 | 4.00 | -3.89 | 5.16 | 0.24 |

clinopyroxene mass = 1.39 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.37Mg0.55Fe'''0.05Ti0.04Al0.20Si1.88O6
G = -19958.08 (J) H = -17253.26 (J) S = 2.64 (J/K) V = 0.41 (cc) Cp = 1.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.04 | 8.39 | 37.05 | 7.77 | 0.38 | 4.27 | 8.10 |

biotite mass = 3.06 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -47877.74 (J) H = -41169.35 (J) S = 6.56 (J/K) V = 1.10 (cc) Cp = 3.83 (J/K)

| annite | phlogopite |
|---|---|
| 7.22 | 92.78 |

feldspar mass = 34.97 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -562090.99 (J) H = -487465.87 (J) S = 72.94 (J/K) V = 13.41 (cc) Cp = 42.90 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.35 | 19.13 | 8.52 |

feldspar mass = 9.36 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -145650.95 (J) H = -126063.87 (J) S = 19.14 (J/K) V = 3.69 (cc) Cp = 11.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.48 | 1.38 | 69.14 |

quartz mass = 25.95 (gm) density = 2.55 (gm/cc)
SiO2
G = -419422.35 (J) H = -367362.88 (J) S = 50.88 (J/K) V = 10.16 (cc) Cp = 30.04 (J/K)

rhm-oxide mass = 0.97 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.09Fe'"0.14Al0.07Ti0.89O3
G = -9234.77 (J) H = -7481.44 (J) S = 1.71 (J/K) V = 0.21 (cc) Cp = 0.88 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.67 | 7.18 | 75.62 | 4.85 | 3.68 |

Total solids mass = 89.45 (gm) density = 2.75 (gm/cc)
G = -1384362.68 (J) H = -1200863.74 (J) S = 179.35 (J/K) V = 32.50 (cc) Cp = 104.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1553660.28 (J) H = -1340930.04 (J) S = 207.92 (J/K) V = 37.08 (cc) Cp = 119.49 (J/K)

Oxygen delta moles = -0.00216746 delta grams = -0.069356
G = 490.95 (J) H = -50.95 (J) S = -0.53 (J/K) V = -184.38 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 8.46 (gm) density = 2.26 (gm/cc) viscosity = 3.48 (log 10 poise) (analysis in wt %)
G = -136656.86 (J) H = -112637.60 (J) S = 23.71 (J/K) V = 3.74 (cc) Cp = 11.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.59 | 0.11 | 11.17 | 0.28 | 0.00 | 0.72 | 0.92 | 0.10 | 0.00 | 0.00 | 2.56 | 5.07 | 3.56 | 1.19 | 9.75 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.39 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.64Mg0.18)3Al2Si3O12
G = -175430.24 (J) H = -150626.39 (J) S = 24.48 (J/K) V = 3.36 (cc) Cp = 14.16 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.55 | 18.12 | 18.33 |

clinopyroxene mass = 1.61 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.39Mg0.52Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -22876.52 (J) H = -19804.73 (J) S = 3.03 (J/K) V = 0.47 (cc) Cp = 1.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.01 | 8.28 | 39.21 | 7.02 | 0.83 | 4.09 | 8.56 |

biotite mass = 4.26 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -66046.95 (J) H = -56874.85 (J) S = 9.05 (J/K) V = 1.52 (cc) Cp = 5.31 (J/K)

| annite | phlogopite |
|---|---|
| 9.00 | 91.00 |

feldspar mass = 34.42 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.18Al1.18Si2.82O8
G = -552468.68 (J) H = -480103.29 (J) S = 71.43 (J/K) V = 13.21 (cc) Cp = 42.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.76 | 17.66 | 8.58 |

feldspar mass = 9.39 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -145904.89 (J) H = -126558.97 (J) S = 19.09 (J/K) V = 3.70 (cc) Cp = 11.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.73 | 1.25 | 69.02 |

quartz mass = 27.43 (gm) density = 2.55 (gm/cc)
SiO2
G = -442926.82 (J) H = -388737.21 (J) S = 53.49 (J/K) V = 10.74 (cc) Cp = 31.72 (J/K)

rhm-oxide mass = 0.98 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.08Fe'"0.15Al0.07Ti0.89O3
G = -9273.76 (J) H = -7528.90 (J) S = 1.72 (J/K) V = 0.21 (cc) Cp = 0.89 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.95 | 7.37 | 76.39 | 4.86 | 3.44 |

Total solids mass = 91.47 (gm) density = 2.75 (gm/cc)
G = -1414927.86 (J) H = -1230234.34 (J) S = 182.30 (J/K) V = 33.22 (cc) Cp = 107.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1551584.72 (J) H = -1342871.95 (J) S = 206.00 (J/K) V = 36.95 (cc) Cp = 119.39 (J/K)

Oxygen delta moles = -0.00217932 delta grams = -0.0697357
G = 488.32 (J) H = -50.47 (J) S = -0.53 (J/K) V = -183.58 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 730.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.07  COH = 1.06
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 6.87 (gm)  density = 2.23 (gm/cc)  viscosity = 2.77 (log 10 poise)  (analysis in wt %)
G = -111421.73 (J)  H = -91314.47 (J)  S = 20.04 (J/K)  V = 3.08 (cc)  Cp = 9.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.90 | 0.08 | 10.77 | 0.30 | 0.00 | 0.75 | 1.16 | 0.09 | 0.00 | 0.00 | 2.88 | 5.78 | 3.04 | 1.46 | 11.79 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 13.46 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.19Fe"0.64Mg0.17)3Al2Si3O12
G = -175860.42 (J)  H = -151339.51 (J)  S = 24.44 (J/K)  V = 3.38 (cc)  Cp = 14.19 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.89 | 18.83 | 17.28 |

clinopyroxene  mass = 1.14 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.84Fe"0.39Mg0.51Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -16265.35 (J)  H = -14111.84 (J)  S = 2.15 (J/K)  V = 0.34 (cc)  Cp = 1.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.90 | 7.38 | 39.38 | 7.54 | 1.13 | 3.87 | 8.80 |

clinopyroxene  mass = 0.32 (gm)  density = 3.60 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.32Mg0.27Fe'"0.05Ti0.40Al0.74Si1.25O6
G = -4511.82 (J)  H = -3931.16 (J)  S = 0.58 (J/K)  V = 0.09 (cc)  Cp = 0.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.79 | 1.22 | 31.61 | 70.48 | 9.40 | -4.74 | 7.82 |

biotite  mass = 4.59 (gm)  density = 2.80 (gm/cc)  (analysis in mole %)
K(Fe"0.10Mg0.90)3AlSi3O10(OH)2
G = -70758.66 (J)  H = -61047.27 (J)  S = 9.68 (J/K)  V = 1.64 (cc)  Cp = 5.70 (J/K)

| annite | phlogopite |
|---|---|
| 9.88 | 90.12 |

feldspar  mass = 34.52 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.74Ca0.18Al1.18Si2.82O8
G = -553457.26 (J)  H = -482024.70 (J)  S = 71.21 (J/K)  V = 13.25 (cc)  Cp = 43.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.13 | 17.68 | 8.19 |

feldspar  mass = 9.93 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -154036.39 (J)  H = -133908.32 (J)  S = 20.06 (J/K)  V = 3.91 (cc)  Cp = 11.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.91 | 1.15 | 69.94 |

quartz  mass = 28.19 (gm)  density = 2.55 (gm/cc)
SiO2
G = -454660.22 (J)  H = -399841.91 (J)  S = 54.65 (J/K)  V = 11.04 (cc)  Cp = 32.56 (J/K)

rhm-oxide  mass = 0.90 (gm)  density = 4.68 (gm/cc)  (analysis in mole %)

Mn0.05Fe"0.77Mg0.08Fe'"0.14Al0.07Ti0.90O3
G = -8538.25 (J) H = -6952.07 (J) S = 1.58 (J/K) V = 0.19 (cc) Cp = 0.82 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.54 | 7.12 | 77.20 | 4.79 | 3.34 |

Total solids mass = 93.05 (gm) density = 2.75 (gm/cc)
G = -1438088.38 (J) H = -1253156.78 (J) S = 184.35 (J/K) V = 33.83 (cc) Cp = 109.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1549510.11 (J) H = -1344471.24 (J) S = 204.40 (J/K) V = 36.91 (cc) Cp = 119.60 (J/K)

Oxygen delta moles = -0.00222246 delta grams = -0.0711162
G = 492.56 (J) H = -50.70 (J) S = -0.54 (J/K) V = -185.36 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.55 (gm)  density = 2.47 (gm/cc)  viscosity = 3.93 (log 10 poise)  (analysis in wt %)
G = -1679963.85 (J)  H = -1238736.60 (J)  S = 280.47 (J/K)  V = 40.25 (cc)  Cp = 142.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.80 | 0.00 | 4.10 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.93 (log 10 poise)

System  mass = 99.55 (gm)  density = 2.47 (gm/cc)
G = -1679963.85 (J)  H = -1238736.60 (J)  S = 280.47 (J/K)  V = 40.25 (cc)  Cp = 142.48 (J/K)

Oxygen  delta moles = 1.38778e-17  delta grams = 4.44073e-16
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.55 (gm)  density = 2.47 (gm/cc)  viscosity = 3.98 (log 10 poise)  (analysis in wt %)
G = -1677165.06 (J)  H = -1240162.50 (J)  S = 279.57 (J/K)  V = 40.23 (cc)  Cp = 142.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.80 | 0.00 | 4.10 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.98 (log 10 poise)

System  mass = 99.55 (gm)  density = 2.47 (gm/cc)
G = -1677165.06 (J)  H = -1240162.50 (J)  S = 279.57 (J/K)  V = 40.23 (cc)  Cp = 142.47 (J/K)

Oxygen  delta moles = 2.60413e-06  delta grams = 8.33291e-05
G = -0.94 (J)  H = 0.11 (J)  S = 0.00 (J/K)  V = 0.34 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.55 (gm)  density = 2.48 (gm/cc)  viscosity = 4.04 (log 10 poise)  (analysis in wt %)
G = -1674375.56 (J)  H = -1241588.47 (J)  S = 278.65 (J/K)  V = 40.20 (cc)  Cp = 142.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.80 | 0.00 | 4.10 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.04 (log 10 poise)

System  mass = 99.55 (gm)  density = 2.48 (gm/cc)
G = -1674375.56 (J)  H = -1241588.47 (J)  S = 278.65 (J/K)  V = 40.20 (cc)  Cp = 142.46 (J/K)

Oxygen  delta moles = 5.53761e-06  delta grams = 0.000177197
G = -1.99 (J)  H = 0.24 (J)  S = 0.00 (J/K)  V = 0.72 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.55 (gm)  density = 2.48 (gm/cc)  viscosity = 4.10 (log 10 poise)  (analysis in wt %)
G = -1671595.42 (J)  H = -1243014.52 (J)  S = 277.73 (J/K)  V = 40.17 (cc)  Cp = 142.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.80 | 0.00 | 4.10 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.10 (log 10 poise)

System  mass = 99.55 (gm)  density = 2.48 (gm/cc)
G = -1671595.42 (J)  H = -1243014.52 (J)  S = 277.73 (J/K)  V = 40.17 (cc)  Cp = 142.45 (J/K)

Oxygen  delta moles = 8.80967e-06  delta grams = 0.000281899
G = -3.15 (J)  H = 0.37 (J)  S = 0.00 (J/K)  V = 1.13 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.55 (gm)  density = 2.48 (gm/cc)  viscosity = 4.16 (log 10 poise)  (analysis in wt %)
G = -1668824.69 (J)  H = -1244440.65 (J)  S = 276.81 (J/K)  V = 40.14 (cc)  Cp = 142.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.80 | 0.00 | 4.10 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.16 (log 10 poise)

System  mass = 99.55 (gm)  density = 2.48 (gm/cc)
G = -1668824.69 (J)  H = -1244440.65 (J)  S = 276.81 (J/K)  V = 40.14 (cc)  Cp = 142.44 (J/K)

Oxygen  delta moles = 1.24299e-05  delta grams = 0.000397742
G = -4.41 (J)  H = 0.52 (J)  S = 0.00 (J/K)  V = 1.58 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.55 (gm)  density = 2.48 (gm/cc)  viscosity = 4.22 (log 10 poise)  (analysis in wt %)
G = -1666063.44 (J)  H = -1245866.88 (J)  S = 275.87 (J/K)  V = 40.11 (cc)  Cp = 142.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.80 | 0.00 | 4.10 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.22 (log 10 poise)

System  mass = 99.55 (gm)  density = 2.48 (gm/cc)
G = -1666063.44 (J)  H = -1245866.88 (J)  S = 275.87 (J/K)  V = 40.11 (cc)  Cp = 142.43 (J/K)

Oxygen  delta moles = 1.64084e-05  delta grams = 0.000525048
G = -5.78 (J)  H = 0.68 (J)  S = 0.00 (J/K)  V = 2.08 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1240.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.24  COH = 2.19  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 99.55 (gm) density = 2.48 (gm/cc) viscosity = 4.28 (log 10 poise) (analysis in wt %)
G = -1663311.73 (J) H = -1247293.20 (J) S = 274.94 (J/K) V = 40.08 (cc) Cp = 142.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.80 | 0.00 | 4.09 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.28 (log 10 poise)

System mass = 99.55 (gm) density = 2.48 (gm/cc)
G = -1663311.73 (J) H = -1247293.20 (J) S = 274.94 (J/K) V = 40.08 (cc) Cp = 142.43 (J/K)

Oxygen delta moles = 2.07555e-05 delta grams = 0.00066415
G = -7.26 (J) H = 0.85 (J) S = 0.01 (J/K) V = 2.61 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 99.55 (gm) density = 2.49 (gm/cc) viscosity = 4.34 (log 10 poise) (analysis in wt %)
G = -1660569.64 (J) H = -1248719.63 (J) S = 273.99 (J/K) V = 40.05 (cc) Cp = 142.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.81 | 0.00 | 4.09 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.34 (log 10 poise)

System mass = 99.55 (gm) density = 2.49 (gm/cc)
G = -1660569.64 (J) H = -1248719.63 (J) S = 273.99 (J/K) V = 40.05 (cc) Cp = 142.42 (J/K)

Oxygen delta moles = 2.54821e-05 delta grams = 0.000815398
G = -8.85 (J) H = 1.04 (J) S = 0.01 (J/K) V = 3.18 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 99.55 (gm) density = 2.49 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -1657837.23 (J) H = -1250146.17 (J) S = 273.04 (J/K) V = 40.02 (cc) Cp = 142.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.81 | 0.00 | 4.09 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.40 (log 10 poise)

System mass = 99.55 (gm) density = 2.49 (gm/cc)
G = -1657837.23 (J) H = -1250146.17 (J) S = 273.04 (J/K) V = 40.02 (cc) Cp = 142.41 (J/K)

Oxygen delta moles = 3.05997e-05 delta grams = 0.000979155
G = -10.55 (J) H = 1.23 (J) S = 0.01 (J/K) V = 3.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 99.55 (gm) density = 2.49 (gm/cc) viscosity = 4.46 (log 10 poise) (analysis in wt %)
G = -1655114.57 (J) H = -1251572.84 (J) S = 272.08 (J/K) V = 39.99 (cc) Cp = 142.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.81 | 0.00 | 4.09 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.46 (log 10 poise)

System mass = 99.55 (gm) density = 2.49 (gm/cc)
G = -1655114.57 (J) H = -1251572.84 (J) S = 272.08 (J/K) V = 39.99 (cc) Cp = 142.40 (J/K)

Oxygen delta moles = 3.61201e-05 delta grams = 0.0011558
G = -12.36 (J) H = 1.44 (J) S = 0.01 (J/K) V = 4.45 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1200.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.12 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 99.55 (gm) density = 2.49 (gm/cc) viscosity = 4.52 (log 10 poise) (analysis in wt %)
G = -1652401.61 (J) H = -1252948.86 (J) S = 271.16 (J/K) V = 39.96 (cc) Cp = 134.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.81 | 0.00 | 4.09 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.52 (log 10 poise)

System mass = 99.55 (gm) density = 2.49 (gm/cc)
G = -1652401.61 (J) H = -1252948.86 (J) S = 271.16 (J/K) V = 39.96 (cc) Cp = 134.98 (J/K)

Oxygen delta moles = 4.20557e-05 delta grams = 0.00134573
G = -14.28 (J) H = 1.67 (J) S = 0.01 (J/K) V = 5.15 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 99.55 (gm) density = 2.49 (gm/cc) viscosity = 4.59 (log 10 poise) (analysis in wt %)
G = -1649698.06 (J) H = -1254301.52 (J) S = 270.24 (J/K) V = 39.93 (cc) Cp = 134.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.50 | 13.96 | 0.81 | 0.00 | 4.09 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.59 (log 10 poise)

System mass = 99.55 (gm) density = 2.49 (gm/cc)
G = -1649698.06 (J) H = -1254301.52 (J) S = 270.24 (J/K) V = 39.93 (cc) Cp = 134.95 (J/K)

Oxygen delta moles = 4.84194e-05 delta grams = 0.00154936
G = -16.32 (J) H = 1.90 (J) S = 0.01 (J/K) V = 5.89 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 98.99 (gm) density = 2.49 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1638479.95 (J) H = -1249277.97 (J) S = 267.83 (J/K) V = 39.71 (cc) Cp = 134.06 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.77 0.50 14.03 0.80 0.00 4.02 0.10 1.77 0.00 0.00 2.72 3.74 2.42 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.55 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.51Mg1.40Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -8506.78 (J) H = -6583.03 (J) S = 1.32 (J/K) V = 0.17 (cc) Cp = 0.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.83 | 96.77 | 51.14 | 3.49 | -3.29 | 5.42 | 0.29 |

Total solids mass = 0.55 (gm) density = 3.32 (gm/cc)
G = -8506.78 (J) H = -6583.03 (J) S = 1.32 (J/K) V = 0.17 (cc) Cp = 0.68 (J/K)

Viscosity of the System: 4.69 (log 10 poise)

System mass = 99.55 (gm) density = 2.50 (gm/cc)
G = -1646986.73 (J) H = -1255861.00 (J) S = 269.16 (J/K) V = 39.88 (cc) Cp = 134.75 (J/K)

Oxygen delta moles = 2.2522e-05 delta grams = 0.000720678
G = -7.53 (J) H = 0.88 (J) S = 0.01 (J/K) V = 2.72 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 98.47 (gm) density = 2.49 (gm/cc) viscosity = 4.78 (log 10 poise) (analysis in wt %)
G = -1627899.08 (J) H = -1244701.01 (J) S = 265.53 (J/K) V = 39.50 (cc) Cp = 133.23 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.85 0.51 14.09 0.80 0.00 3.96 0.10 1.65 0.00 0.00 2.73 3.76 2.44 0.10 1.02 0.00 0.00 0.00 0.00

orthopyroxene mass = 1.08 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.53Mg1.38Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -16386.72 (J) H = -12701.96 (J) S = 2.55 (J/K) V = 0.32 (cc) Cp = 1.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.66 | 96.62 | 52.98 | 3.58 | -3.38 | 5.55 | 0.30 |

Total solids mass = 1.08 (gm) density = 3.33 (gm/cc)
G = -16386.72 (J) H = -12701.96 (J) S = 2.55 (J/K) V = 0.32 (cc) Cp = 1.32 (J/K)

Viscosity of the System: 4.79 (log 10 poise)

System mass = 99.55 (gm) density = 2.50 (gm/cc)
G = -1644285.81 (J) H = -1257402.97 (J) S = 268.08 (J/K) V = 39.83 (cc) Cp = 134.56 (J/K)

Oxygen delta moles = -4.01152e-06 delta grams = -0.000128364
G = 1.33 (J) H = -0.15 (J) S = -0.00 (J/K) V = -0.48 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1160.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.19  COH = 2.05  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.96 (gm)  density = 2.49 (gm/cc)  viscosity = 4.87 (log 10 poise)  (analysis in wt %)
G = -1617601.40 (J)  H = -1240307.60 (J)  S = 263.26 (J/K)  V = 39.30 (cc)  Cp = 132.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.94 | 0.51 | 14.15 | 0.79 | 0.00 | 3.89 | 0.10 | 1.54 | 0.00 | 0.00 | 2.74 | 3.78 | 2.45 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.58 (gm)  density = 3.34 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.55Mg1.36Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -23993.18 (J)  H = -18628.59 (J)  S = 3.74 (J/K)  V = 0.47 (cc)  Cp = 1.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.53 | 96.47 | 54.87 | 3.68 | -3.48 | 5.68 | 0.32 |

Total solids  mass = 1.58 (gm)  density = 3.34 (gm/cc)
G = -23993.18 (J)  H = -18628.59 (J)  S = 3.74 (J/K)  V = 0.47 (cc)  Cp = 1.94 (J/K)

Viscosity of the System: 4.89 (log 10 poise)

System  mass = 99.54 (gm)  density = 2.50 (gm/cc)
G = -1641594.58 (J)  H = -1258936.19 (J)  S = 267.01 (J/K)  V = 39.78 (cc)  Cp = 134.37 (J/K)

Oxygen  delta moles = -3.25046e-05  delta grams = -0.00104011
G = 10.70 (J)  H = -1.24 (J)  S = -0.01 (J/K)  V = -3.87 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1150.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.19  COH = 2.03  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.46 (gm)  density = 2.49 (gm/cc)  viscosity = 4.97 (log 10 poise)  (analysis in wt %)
G = -1607565.61 (J)  H = -1236082.99 (J)  S = 261.03 (J/K)  V = 39.11 (cc)  Cp = 131.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.02 | 0.51 | 14.21 | 0.78 | 0.00 | 3.81 | 0.10 | 1.43 | 0.00 | 0.00 | 2.75 | 3.79 | 2.46 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.08 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.33Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -31347.41 (J)  H = -24378.28 (J)  S = 4.90 (J/K)  V = 0.62 (cc)  Cp = 2.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.46 | 96.32 | 56.80 | 3.78 | -3.58 | 5.81 | 0.33 |

Total solids  mass = 2.08 (gm)  density = 3.35 (gm/cc)

G = -31347.41 (J)  H = -24378.28 (J)  S = 4.90 (J/K)  V = 0.62 (cc)  Cp = 2.54 (J/K)

Viscosity of the System: 4.99 (log 10 poise)

System  mass = 99.54 (gm)  density = 2.51 (gm/cc)
G = -1638913.02 (J)  H = -1260461.28 (J)  S = 265.93 (J/K)  V = 39.73 (cc)  Cp = 134.18 (J/K)

Oxygen  delta moles = -6.30709e-05  delta grams = -0.00201819
G = 20.61 (J)  H = -2.38 (J)  S = -0.02 (J/K)  V = -7.46 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1140.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.18  COH = 2.01  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.97 (gm)  density = 2.49 (gm/cc)  viscosity = 5.06 (log 10 poise)  (analysis in wt %)
G = -1597772.50 (J)  H = -1232013.78 (J)  S = 258.83 (J/K)  V = 38.91 (cc)  Cp = 130.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.11 | 0.51 | 14.27 | 0.76 | 0.00 | 3.73 | 0.10 | 1.32 | 0.00 | 0.00 | 2.76 | 3.81 | 2.47 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.57 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.59Mg1.31Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -38468.59 (J)  H = -29965.01 (J)  S = 6.02 (J/K)  V = 0.77 (cc)  Cp = 3.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.42 | 96.16 | 58.76 | 3.89 | -3.69 | 5.96 | 0.34 |

Total solids  mass = 2.57 (gm)  density = 3.36 (gm/cc)
G = -38468.59 (J)  H = -29965.01 (J)  S = 6.02 (J/K)  V = 0.77 (cc)  Cp = 3.13 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System  mass = 99.54 (gm)  density = 2.51 (gm/cc)
G = -1636241.09 (J)  H = -1261978.79 (J)  S = 264.84 (J/K)  V = 39.68 (cc)  Cp = 134.00 (J/K)

Oxygen  delta moles = -9.58134e-05  delta grams = -0.00306591
G = 31.06 (J)  H = -3.59 (J)  S = -0.02 (J/K)  V = -11.26 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1130.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.17  COH = 1.99  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.49 (gm)  density = 2.49 (gm/cc)  viscosity = 5.16 (log 10 poise)  (analysis in wt %)
G = -1588204.95 (J)  H = -1228087.93 (J)  S = 256.65 (J/K)  V = 38.72 (cc)  Cp = 130.12 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

69.20 0.52 14.33 0.75 0.00 3.65 0.10 1.23 0.00 0.00 2.77 3.83 2.49 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.05 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.61Mg1.29Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -45373.83 (J) H = -35401.28 (J) S = 7.11 (J/K) V = 0.91 (cc) Cp = 3.70 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-63.42 96.00 60.76 4.00 -3.80 6.10 0.35

Total solids mass = 3.05 (gm) density = 3.37 (gm/cc)
G = -45373.83 (J) H = -35401.28 (J) S = 7.11 (J/K) V = 0.91 (cc) Cp = 3.70 (J/K)

Viscosity of the System: 5.20 (log 10 poise)

System mass = 99.54 (gm) density = 2.51 (gm/cc)
G = -1633578.79 (J) H = -1263489.21 (J) S = 263.76 (J/K) V = 39.63 (cc) Cp = 133.82 (J/K)

Oxygen delta moles = -0.000130821 delta grams = -0.00418612
G = 42.07 (J) H = -4.85 (J) S = -0.03 (J/K) V = -15.26 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 96.01 (gm) density = 2.49 (gm/cc) viscosity = 5.26 (log 10 poise) (analysis in wt %)
G = -1578848.00 (J) H = -1224294.84 (J) S = 254.50 (J/K) V = 38.54 (cc) Cp = 129.38 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.29 0.52 14.38 0.74 0.00 3.56 0.10 1.14 0.00 0.00 2.78 3.85 2.50 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.53 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.63Mg1.26Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -52078.11 (J) H = -40698.10 (J) S = 8.17 (J/K) V = 1.04 (cc) Cp = 4.26 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-65.45 95.84 62.78 4.12 -3.92 6.26 0.37

Total solids mass = 3.53 (gm) density = 3.38 (gm/cc)
G = -52078.11 (J) H = -40698.10 (J) S = 8.17 (J/K) V = 1.04 (cc) Cp = 4.26 (J/K)

Viscosity of the System: 5.31 (log 10 poise)

System mass = 99.54 (gm) density = 2.51 (gm/cc)
G = -1630926.11 (J) H = -1264992.95 (J) S = 262.67 (J/K) V = 39.58 (cc) Cp = 133.65 (J/K)

Oxygen delta moles = -0.000168165 delta grams = -0.00538109
G = 53.65 (J) H = -6.17 (J) S = -0.04 (J/K) V = -19.48 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1110.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.16  COH = 1.95  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.55 (gm)  density = 2.49 (gm/cc)  viscosity = 5.36 (log 10 poise)  (analysis in wt %)
G = -1569688.87 (J)  H = -1220625.38 (J)  S = 252.37 (J/K)  V = 38.36 (cc)  Cp = 128.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.38 | 0.52 | 14.44 | 0.73 | 0.00 | 3.46 | 0.10 | 1.05 | 0.00 | 0.00 | 2.78 | 3.87 | 2.51 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.99 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.65Mg1.24Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -58594.21 (J)  H = -45864.97 (J)  S = 9.20 (J/K)  V = 1.18 (cc)  Cp = 4.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.50 | 95.69 | 64.81 | 4.25 | -4.05 | 6.42 | 0.38 |

Total solids  mass = 3.99 (gm)  density = 3.39 (gm/cc)
G = -58594.21 (J)  H = -45864.97 (J)  S = 9.20 (J/K)  V = 1.18 (cc)  Cp = 4.81 (J/K)

Viscosity of the System: 5.42 (log 10 poise)

System  mass = 99.54 (gm)  density = 2.52 (gm/cc)
G = -1628283.08 (J)  H = -1266490.35 (J)  S = 261.57 (J/K)  V = 39.53 (cc)  Cp = 133.47 (J/K)

Oxygen  delta moles = -0.000207898  delta grams = -0.0066525
G = 65.80 (J)  H = -7.55 (J)  S = -0.05 (J/K)  V = -23.91 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1100.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.93  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.09 (gm)  density = 2.49 (gm/cc)  viscosity = 5.46 (log 10 poise)  (analysis in wt %)
G = -1560717.01 (J)  H = -1217071.92 (J)  S = 250.26 (J/K)  V = 38.18 (cc)  Cp = 127.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.47 | 0.52 | 14.50 | 0.71 | 0.00 | 3.36 | 0.11 | 0.97 | 0.00 | 0.00 | 2.79 | 3.89 | 2.52 | 0.11 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.45 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.67Mg1.22Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -64932.72 (J)  H = -50909.76 (J)  S = 10.21 (J/K)  V = 1.31 (cc)  Cp = 5.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.58 | 95.53 | 66.86 | 4.39 | -4.18 | 6.59 | 0.39 |

Total solids  mass = 4.45 (gm)  density = 3.40 (gm/cc)
G = -64932.72 (J)  H = -50909.76 (J)  S = 10.21 (J/K)  V = 1.31 (cc)  Cp = 5.35 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 99.54 (gm) density = 2.52 (gm/cc)
G = -1625649.73 (J) H = -1267981.68 (J) S = 260.47 (J/K) V = 39.49 (cc) Cp = 133.30 (J/K)

Oxygen delta moles = -0.000250048 delta grams = -0.00800123
G = 78.50 (J) H = -8.99 (J) S = -0.06 (J/K) V = -28.55 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1090.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.91 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 94.63 (gm) density = 2.49 (gm/cc) viscosity = 5.57 (log 10 poise) (analysis in wt %)
G = -1551924.09 (J) H = -1213628.34 (J) S = 248.17 (J/K) V = 38.00 (cc) Cp = 127.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.57 | 0.53 | 14.55 | 0.69 | 0.00 | 3.26 | 0.11 | 0.90 | 0.00 | 0.00 | 2.80 | 3.91 | 2.54 | 0.11 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.91 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.69Mg1.19Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -71102.00 (J) H = -55838.80 (J) S = 11.20 (J/K) V = 1.44 (cc) Cp = 5.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.65 | 95.38 | 68.90 | 4.53 | -4.32 | 6.77 | 0.41 |

Total solids mass = 4.91 (gm) density = 3.41 (gm/cc)
G = -71102.00 (J) H = -55838.80 (J) S = 11.20 (J/K) V = 1.44 (cc) Cp = 5.87 (J/K)

Viscosity of the System: 5.63 (log 10 poise)

System mass = 99.54 (gm) density = 2.52 (gm/cc)
G = -1623026.10 (J) H = -1269467.14 (J) S = 259.37 (J/K) V = 39.44 (cc) Cp = 133.13 (J/K)

Oxygen delta moles = -0.000294616 delta grams = -0.00942735
G = 91.74 (J) H = -10.49 (J) S = -0.07 (J/K) V = -33.39 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1080.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.14 COH = 1.89 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 94.18 (gm) density = 2.49 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1543304.01 (J) H = -1210290.08 (J) S = 246.10 (J/K) V = 37.83 (cc) Cp = 126.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.67 | 0.53 | 14.60 | 0.68 | 0.00 | 3.15 | 0.11 | 0.83 | 0.00 | 0.00 | 2.80 | 3.92 | 2.55 | 0.11 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.36 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.71Mg1.17Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -77108.25 (J) H = -60656.77 (J) S = 12.16 (J/K) V = 1.57 (cc) Cp = 6.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.73 | 95.22 | 70.93 | 4.68 | -4.47 | 6.95 | 0.42 |

Total solids mass = 5.36 (gm) density = 3.42 (gm/cc)
G = -77108.25 (J) H = -60656.77 (J) S = 12.16 (J/K) V = 1.57 (cc) Cp = 6.38 (J/K)

Viscosity of the System: 5.75 (log 10 poise)

System mass = 99.53 (gm) density = 2.53 (gm/cc)
G = -1620412.26 (J) H = -1270946.85 (J) S = 258.26 (J/K) V = 39.39 (cc) Cp = 132.96 (J/K)

Oxygen delta moles = -0.000341575 delta grams = -0.01093
G = 105.50 (J) H = -12.04 (J) S = -0.09 (J/K) V = -38.43 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1070.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.87 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 93.59 (gm) density = 2.49 (gm/cc) viscosity = 5.78 (log 10 poise) (analysis in wt %)
G = -1532517.90 (J) H = -1205209.43 (J) S = 243.69 (J/K) V = 37.60 (cc) Cp = 125.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.78 | 0.53 | 14.64 | 0.66 | 0.00 | 3.04 | 0.11 | 0.76 | 0.00 | 0.00 | 2.81 | 3.94 | 2.56 | 0.11 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.81 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.73Mg1.14Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -83086.79 (J) H = -65468.69 (J) S = 13.12 (J/K) V = 1.69 (cc) Cp = 6.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.86 | 95.09 | 72.99 | 4.83 | -4.62 | 7.14 | 0.43 |

feldspar mass = 0.13 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.67Ca0.30Al1.30Si2.70O8
G = -2202.59 (J) H = -1779.51 (J) S = 0.31 (J/K) V = 0.05 (cc) Cp = 0.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.56 | 30.18 | 3.26 |

Total solids mass = 5.94 (gm) density = 3.40 (gm/cc)
G = -85289.38 (J) H = -67248.20 (J) S = 13.43 (J/K) V = 1.74 (cc) Cp = 7.06 (J/K)

Viscosity of the System: 5.86 (log 10 poise)

System mass = 99.53 (gm) density = 2.53 (gm/cc)
G = -1617807.27 (J) H = -1272457.63 (J) S = 257.12 (J/K) V = 39.34 (cc) Cp = 132.77 (J/K)

Oxygen delta moles = -0.000392755 delta grams = -0.0125677

G = 120.31 (J)  H = -13.70 (J)  S = -0.10 (J/K)  V = -43.86 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1060.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.13  COH = 1.84  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.93 (gm)  density = 2.49 (gm/cc)  viscosity = 5.89 (log 10 poise)  (analysis in wt %)
G = -1470957.61 (J)  H = -1159878.15 (J)  S = 233.34 (J/K)  V = 36.18 (cc)  Cp = 120.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.23 | 0.55 | 14.39 | 0.64 | 0.00 | 2.96 | 0.11 | 0.69 | 0.00 | 0.00 | 2.71 | 3.84 | 2.65 | 0.11 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.46 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.76Mg1.11Fe'''0.03Ti0.00Al0.12Si1.93O6
G = -91625.13 (J)  H = -72280.57 (J)  S = 14.51 (J/K)  V = 1.88 (cc)  Cp = 7.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.22 | 95.22 | 76.21 | 4.81 | -4.60 | 7.16 | 0.43 |

feldspar  mass = 3.13 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.03Na0.67Ca0.29Al1.29Si2.71O8
G = -52609.84 (J)  H = -42598.05 (J)  S = 7.51 (J/K)  V = 1.20 (cc)  Cp = 3.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.23 | 29.35 | 3.43 |

Total solids  mass = 9.60 (gm)  density = 3.12 (gm/cc)
G = -144234.96 (J)  H = -114878.62 (J)  S = 22.02 (J/K)  V = 3.08 (cc)  Cp = 11.48 (J/K)

Viscosity of the System: 6.04 (log 10 poise)

System  mass = 99.53 (gm)  density = 2.54 (gm/cc)
G = -1615192.57 (J)  H = -1274756.76 (J)  S = 255.36 (J/K)  V = 39.26 (cc)  Cp = 132.00 (J/K)

Oxygen  delta moles = -0.000488958  delta grams = -0.0156461
G = 148.53 (J)  H = -16.88 (J)  S = -0.12 (J/K)  V = -54.20 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1050.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.12  COH = 1.82  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 86.51 (gm)  density = 2.48 (gm/cc)  viscosity = 6.00 (log 10 poise)  (analysis in wt %)
G = -1413664.97 (J)  H = -1117696.04 (J)  S = 223.69 (J/K)  V = 34.86 (cc)  Cp = 115.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.68 | 0.57 | 14.16 | 0.63 | 0.00 | 2.86 | 0.12 | 0.62 | 0.00 | 0.00 | 2.62 | 3.73 | 2.73 | 0.12 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.08 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.79Mg1.08Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -99518.20 (J) H = -78604.67 (J) S = 15.81 (J/K) V = 2.05 (cc) Cp = 8.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.46 | 95.36 | 79.30 | 4.80 | -4.59 | 7.18 | 0.42 |

feldspar mass = 5.93 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.29Al1.29Si2.71O8
G = -99411.45 (J) H = -80671.05 (J) S = 14.16 (J/K) V = 2.27 (cc) Cp = 7.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.81 | 28.60 | 3.59 |

Total solids mass = 13.02 (gm) density = 3.01 (gm/cc)
G = -198929.65 (J) H = -159275.72 (J) S = 29.97 (J/K) V = 4.32 (cc) Cp = 15.58 (J/K)

Viscosity of the System: 6.21 (log 10 poise)

System mass = 99.53 (gm) density = 2.54 (gm/cc)
G = -1612594.62 (J) H = -1276971.76 (J) S = 253.65 (J/K) V = 39.18 (cc) Cp = 131.29 (J/K)

Oxygen delta moles = -0.000586364 delta grams = -0.018763
G = 176.64 (J) H = -20.03 (J) S = -0.15 (J/K) V = -64.51 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1040.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.11 COH = 1.80 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 82.55 (gm) density = 2.48 (gm/cc) viscosity = 6.08 (log 10 poise) (analysis in wt %)
G = -1347542.46 (J) H = -1068119.60 (J) S = 212.79 (J/K) V = 33.31 (cc) Cp = 110.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.01 | 0.60 | 13.97 | 0.61 | 0.00 | 2.77 | 0.12 | 0.57 | 0.00 | 0.00 | 2.55 | 3.63 | 2.84 | 0.12 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.70 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.05Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -107195.49 (J) H = -84778.55 (J) S = 17.07 (J/K) V = 2.22 (cc) Cp = 9.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.61 | 95.48 | 82.29 | 4.80 | -4.59 | 7.22 | 0.41 |

feldspar mass = 8.81 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -147451.51 (J) H = -119921.13 (J) S = 20.97 (J/K) V = 3.38 (cc) Cp = 10.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.23 | 27.99 | 3.78 |

quartz mass = 0.47 (gm) density = 2.56 (gm/cc)
SiO2
G = -7822.87 (J) H = -6439.42 (J) S = 1.05 (J/K) V = 0.18 (cc) Cp = 0.56 (J/K)

Total solids mass = 16.98 (gm) density = 2.94 (gm/cc)
G = -262469.87 (J) H = -211139.10 (J) S = 39.09 (J/K) V = 5.78 (cc) Cp = 20.42 (J/K)

Viscosity of the System: 6.39 (log 10 poise)

System mass = 99.52 (gm) density = 2.55 (gm/cc)
G = -1610012.33 (J) H = -1279258.70 (J) S = 251.88 (J/K) V = 39.09 (cc) Cp = 130.64 (J/K)

Oxygen delta moles = -0.00068635 delta grams = -0.0219624
G = 205.02 (J) H = -23.20 (J) S = -0.17 (J/K) V = -74.94 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1030.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.10 COH = 1.78 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 76.62 (gm) density = 2.48 (gm/cc) viscosity = 6.10 (log 10 poise) (analysis in wt %)
G = -1248990.48 (J) H = -991999.44 (J) S = 197.21 (J/K) V = 30.95 (cc) Cp = 102.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.95 | 0.65 | 13.94 | 0.60 | 0.00 | 2.71 | 0.13 | 0.52 | 0.00 | 0.00 | 2.49 | 3.56 | 3.02 | 0.13 | 1.31 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.35 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.85Mg1.02Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -115310.85 (J) H = -91316.83 (J) S = 18.41 (J/K) V = 2.40 (cc) Cp = 9.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.79 | 95.58 | 85.22 | 4.87 | -4.65 | 7.36 | 0.40 |

feldspar mass = 12.25 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -204645.92 (J) H = -166811.19 (J) S = 29.03 (J/K) V = 4.70 (cc) Cp = 15.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.31 | 27.61 | 4.07 |

quartz mass = 2.30 (gm) density = 2.56 (gm/cc)
SiO2
G = -38500.02 (J) H = -31761.48 (J) S = 5.17 (J/K) V = 0.90 (cc) Cp = 2.74 (J/K)

Total solids mass = 22.90 (gm) density = 2.86 (gm/cc)
G = -358456.79 (J) H = -289889.50 (J) S = 52.62 (J/K) V = 8.00 (cc) Cp = 27.55 (J/K)

Viscosity of the System: 6.56 (log 10 poise)

System mass = 99.52 (gm) density = 2.56 (gm/cc)
G = -1607447.27 (J) H = -1281888.93 (J) S = 249.82 (J/K) V = 38.95 (cc) Cp = 129.80 (J/K)

Oxygen delta moles = -0.000790965 delta grams = -0.0253099
G = 234.26 (J) H = -26.45 (J) S = -0.20 (J/K) V = -85.70 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1020.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.10  COH = 1.76  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 71.35 (gm)  density = 2.47 (gm/cc)  viscosity = 6.12 (log 10 poise)  (analysis in wt %)
G = -1161715.05 (J)  H = -924569.47 (J)  S = 183.39 (J/K)  V = 28.86 (cc)  Cp = 95.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.89 | 0.70 | 13.92 | 0.59 | 0.00 | 2.64 | 0.14 | 0.47 | 0.00 | 0.00 | 2.44 | 3.48 | 3.20 | 0.14 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.95 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.88Mg1.00Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -122539.07 (J)  H = -97181.96 (J)  S = 19.61 (J/K)  V = 2.56 (cc)  Cp = 10.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.70 | 95.68 | 87.90 | 4.94 | -4.70 | 7.48 | 0.40 |

feldspar  mass = 15.30 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.04Na0.68Ca0.27Al1.27Si2.73O8
G = -255206.54 (J)  H = -208492.16 (J)  S = 36.12 (J/K)  V = 5.87 (cc)  Cp = 18.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.37 | 27.27 | 4.36 |

quartz  mass = 3.92 (gm)  density = 2.56 (gm/cc)
SiO2
G = -65443.87 (J)  H = -54108.52 (J)  S = 8.77 (J/K)  V = 1.53 (cc)  Cp = 4.66 (J/K)

Total solids  mass = 28.17 (gm)  density = 2.83 (gm/cc)
G = -443189.48 (J)  H = -359782.63 (J)  S = 64.50 (J/K)  V = 9.96 (cc)  Cp = 33.85 (J/K)

Viscosity of the System: 6.74 (log 10 poise)

System  mass = 99.52 (gm)  density = 2.56 (gm/cc)
G = -1604904.53 (J)  H = -1284352.10 (J)  S = 247.88 (J/K)  V = 38.82 (cc)  Cp = 129.04 (J/K)

Oxygen  delta moles = -0.000891337  delta grams = -0.0285217
G = 261.74 (J)  H = -29.49 (J)  S = -0.23 (J/K)  V = -95.83 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1010.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.09  COH = 1.73  IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 66.65 (gm)  density = 2.47 (gm/cc)  viscosity = 6.13 (log 10 poise)  (analysis in wt %)
G = -1083988.48 (J)  H = -864494.04 (J)  S = 171.06 (J/K)  V = 27.00 (cc)  Cp = 88.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

70.83 0.74 13.90 0.58 0.00 2.55 0.15 0.43 0.00 0.00 2.39 3.40 3.38 0.15 1.50 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.48 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg0.97Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -128974.50 (J) H = -102447.87 (J) S = 20.67 (J/K) V = 2.70 (cc) Cp = 10.98 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-94.32 95.77 90.33 5.00 -4.75 7.58 0.39

feldspar mass = 18.02 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -300145.37 (J) H = -245756.72 (J) S = 42.39 (J/K) V = 6.91 (cc) Cp = 22.11 (J/K)
albite anorthite sanidine
68.39 26.96 4.65

quartz mass = 5.35 (gm) density = 2.56 (gm/cc)
SiO2
G = -89274.88 (J) H = -73974.26 (J) S = 11.92 (J/K) V = 2.09 (cc) Cp = 6.36 (J/K)

Total solids mass = 32.86 (gm) density = 2.81 (gm/cc)
G = -518394.75 (J) H = -422178.85 (J) S = 74.98 (J/K) V = 11.71 (cc) Cp = 39.46 (J/K)

Viscosity of the System: 6.94 (log 10 poise)

System mass = 99.51 (gm) density = 2.57 (gm/cc)
G = -1602383.23 (J) H = -1286672.89 (J) S = 246.04 (J/K) V = 38.71 (cc) Cp = 128.35 (J/K)

Oxygen delta moles = -0.00098713 delta grams = -0.031587
G = 287.37 (J) H = -32.30 (J) S = -0.25 (J/K) V = -105.31 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 62.44 (gm) density = 2.47 (gm/cc) viscosity = 6.15 (log 10 poise) (analysis in wt %)
G = -1014416.91 (J) H = -810696.22 (J) S = 160.01 (J/K) V = 25.32 (cc) Cp = 83.25 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.78 0.79 13.88 0.56 0.00 2.45 0.16 0.40 0.00 0.00 2.34 3.32 3.56 0.16 1.60 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.97 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.93Mg0.95Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -134695.52 (J) H = -107175.31 (J) S = 21.62 (J/K) V = 2.84 (cc) Cp = 11.51 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-96.68 95.85 92.51 5.05 -4.78 7.66 0.39

feldspar mass = 20.46 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -340281.16 (J) H = -279246.19 (J) S = 47.94 (J/K) V = 7.85 (cc) Cp = 25.08 (J/K)

albite anorthite sanidine
68.39 26.67 4.94

quartz mass = 6.64 (gm) density = 2.56 (gm/cc)
SiO2
G = -110489.00 (J) H = -91753.54 (J) S = 14.72 (J/K) V = 2.60 (cc) Cp = 7.88 (J/K)

Total solids mass = 37.07 (gm) density = 2.79 (gm/cc)
G = -585465.67 (J) H = -478175.04 (J) S = 84.27 (J/K) V = 13.28 (cc) Cp = 44.47 (J/K)

Viscosity of the System: 7.16 (log 10 poise)

System mass = 99.51 (gm) density = 2.58 (gm/cc)
G = -1599882.59 (J) H = -1288871.26 (J) S = 244.28 (J/K) V = 38.60 (cc) Cp = 127.72 (J/K)

Oxygen delta moles = -0.00107811 delta grams = -0.0344981
G = 311.14 (J) H = -34.89 (J) S = -0.27 (J/K) V = -114.12 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 990.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.68 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 58.64 (gm) density = 2.46 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -951857.44 (J) H = -762293.52 (J) S = 150.07 (J/K) V = 23.82 (cc) Cp = 78.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.72 | 0.84 | 13.87 | 0.54 | 0.00 | 2.34 | 0.17 | 0.37 | 0.00 | 0.00 | 2.30 | 3.24 | 3.74 | 0.17 | 1.71 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.41 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.94Mg0.93Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -139770.60 (J) H = -111416.77 (J) S = 22.45 (J/K) V = 2.95 (cc) Cp = 11.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.78 | 95.93 | 94.47 | 5.10 | -4.82 | 7.72 | 0.38 |

feldspar mass = 22.67 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.26Al1.26Si2.74O8
G = -376286.41 (J) H = -309487.44 (J) S = 52.88 (J/K) V = 8.69 (cc) Cp = 27.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.37 | 26.40 | 5.24 |

quartz mass = 7.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -129487.44 (J) H = -107765.96 (J) S = 17.20 (J/K) V = 3.05 (cc) Cp = 9.24 (J/K)

Total solids mass = 40.87 (gm) density = 2.78 (gm/cc)
G = -645544.45 (J) H = -528670.17 (J) S = 92.53 (J/K) V = 14.69 (cc) Cp = 48.97 (J/K)

Viscosity of the System: 7.41 (log 10 poise)

System mass = 99.51 (gm) density = 2.58 (gm/cc)
G = -1597401.89 (J) H = -1290963.69 (J) S = 242.60 (J/K) V = 38.51 (cc) Cp = 127.14 (J/K)

Oxygen delta moles = -0.00116414 delta grams = -0.0372511
G = 333.04 (J) H = -37.26 (J) S = -0.29 (J/K) V = -122.26 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 980.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.66 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 55.21 (gm) density = 2.46 (gm/cc) viscosity = 6.18 (log 10 poise) (analysis in wt %)
G = -895360.42 (J) H = -718553.11 (J) S = 141.09 (J/K) V = 22.45 (cc) Cp = 73.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.65 | 0.90 | 13.86 | 0.52 | 0.00 | 2.22 | 0.18 | 0.34 | 0.00 | 0.00 | 2.27 | 3.15 | 3.91 | 0.18 | 1.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.81 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.96Mg0.92Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -144261.77 (J) H = -115219.28 (J) S = 23.18 (J/K) V = 3.06 (cc) Cp = 12.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.64 | 96.00 | 96.22 | 5.14 | -4.84 | 7.75 | 0.37 |

feldspar mass = 24.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -408720.34 (J) H = -336918.81 (J) S = 57.30 (J/K) V = 9.45 (cc) Cp = 30.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.32 | 26.15 | 5.53 |

quartz mass = 8.83 (gm) density = 2.56 (gm/cc)
SiO2
G = -146597.94 (J) H = -122272.75 (J) S = 19.41 (J/K) V = 3.45 (cc) Cp = 10.46 (J/K)

Total solids mass = 44.30 (gm) density = 2.77 (gm/cc)
G = -699580.06 (J) H = -574410.84 (J) S = 99.88 (J/K) V = 15.96 (cc) Cp = 53.02 (J/K)

Viscosity of the System: 7.72 (log 10 poise)

System mass = 99.51 (gm) density = 2.59 (gm/cc)
G = -1594940.47 (J) H = -1292963.95 (J) S = 240.97 (J/K) V = 38.42 (cc) Cp = 126.61 (J/K)

Oxygen delta moles = -0.00124521 delta grams = -0.0398451
G = 353.09 (J) H = -39.41 (J) S = -0.31 (J/K) V = -129.74 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 970.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.06 COH = 1.64 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 52.10 (gm) density = 2.46 (gm/cc) viscosity = 6.19 (log 10 poise) (analysis in wt %)
G = -844128.56 (J) H = -678860.10 (J) S = 132.94 (J/K) V = 21.22 (cc) Cp = 69.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.58 | 0.95 | 13.85 | 0.50 | 0.00 | 2.11 | 0.19 | 0.31 | 0.00 | 0.00 | 2.23 | 3.07 | 4.09 | 0.19 | 1.92 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.17 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.90Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -148226.27 (J) H = -118625.89 (J) S = 23.81 (J/K) V = 3.15 (cc) Cp = 12.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.29 | 96.06 | 97.77 | 5.18 | -4.86 | 7.77 | 0.37 |

feldspar mass = 26.47 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -438052.43 (J) H = -361908.50 (J) S = 61.25 (J/K) V = 10.15 (cc) Cp = 32.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.26 | 25.92 | 5.82 |

quartz mass = 9.77 (gm) density = 2.56 (gm/cc)
SiO2
G = -162090.45 (J) H = -135489.23 (J) S = 21.40 (J/K) V = 3.82 (cc) Cp = 11.58 (J/K)

Total solids mass = 47.41 (gm) density = 2.77 (gm/cc)
G = -748369.15 (J) H = -616023.62 (J) S = 106.46 (J/K) V = 17.12 (cc) Cp = 56.69 (J/K)

Viscosity of the System: 8.13 (log 10 poise)

System mass = 99.50 (gm) density = 2.60 (gm/cc)
G = -1592497.72 (J) H = -1294883.72 (J) S = 239.40 (J/K) V = 38.34 (cc) Cp = 126.12 (J/K)

Oxygen delta moles = -0.00132137 delta grams = -0.0422822
G = 371.37 (J) H = -41.35 (J) S = -0.33 (J/K) V = -136.58 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 960.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.05 COH = 1.61 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 49.26 (gm) density = 2.45 (gm/cc) viscosity = 6.20 (log 10 poise) (analysis in wt %)
G = -797487.15 (J) H = -642694.34 (J) S = 125.53 (J/K) V = 20.09 (cc) Cp = 65.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.51 | 1.00 | 13.85 | 0.48 | 0.00 | 1.99 | 0.20 | 0.29 | 0.00 | 0.00 | 2.20 | 2.99 | 4.26 | 0.20 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.48 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.89Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -151717.21 (J) H = -121676.32 (J) S = 24.36 (J/K) V = 3.24 (cc) Cp = 13.10 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.75 96.12 99.16 5.21 -4.88 7.77 0.36

feldspar mass = 28.12 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -464679.83 (J) H = -384768.21 (J) S = 64.80 (J/K) V = 10.78 (cc) Cp = 34.33 (J/K)
albite anorthite sanidine
68.18 25.71 6.11

quartz mass = 10.64 (gm) density = 2.56 (gm/cc)
SiO2
G = -176188.85 (J) H = -147594.08 (J) S = 23.19 (J/K) V = 4.16 (cc) Cp = 12.59 (J/K)

Total solids mass = 50.24 (gm) density = 2.76 (gm/cc)
G = -792585.89 (J) H = -654038.61 (J) S = 112.35 (J/K) V = 18.17 (cc) Cp = 60.02 (J/K)

Viscosity of the System: 8.80 (log 10 poise)

System mass = 99.50 (gm) density = 2.60 (gm/cc)
G = -1590073.05 (J) H = -1296732.95 (J) S = 237.88 (J/K) V = 38.26 (cc) Cp = 125.66 (J/K)

Oxygen delta moles = -0.00139276 delta grams = -0.0445667
G = 387.94 (J) H = -43.08 (J) S = -0.35 (J/K) V = -142.80 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 950.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.04 COH = 1.58 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 46.66 (gm) density = 2.45 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -754861.64 (J) H = -609613.04 (J) S = 118.75 (J/K) V = 19.05 (cc) Cp = 62.19 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.42 1.06 13.85 0.45 0.00 1.87 0.21 0.27 0.00 0.00 2.18 2.90 4.43 0.21 2.14 0.00 0.00 0.00 0.00

orthopyroxene mass = 11.77 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.87Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -154783.80 (J) H = -124407.21 (J) S = 24.83 (J/K) V = 3.31 (cc) Cp = 13.40 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-105.03 96.17 100.39 5.24 -4.89 7.76 0.36

feldspar mass = 29.64 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -488940.51 (J) H = -405763.43 (J) S = 68.00 (J/K) V = 11.36 (cc) Cp = 36.14 (J/K)
albite anorthite sanidine
68.08 25.51 6.41

quartz mass = 11.43 (gm) density = 2.56 (gm/cc)
SiO2
G = -189079.97 (J) H = -158736.52 (J) S = 24.81 (J/K) V = 4.47 (cc) Cp = 13.52 (J/K)

Total solids mass = 52.83 (gm) density = 2.76 (gm/cc)
G = -832804.29 (J) H = -688907.16 (J) S = 117.64 (J/K) V = 19.14 (cc) Cp = 63.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.50 (gm) density = 2.61 (gm/cc)
G = -1587665.92 (J) H = -1298520.20 (J) S = 236.39 (J/K) V = 38.19 (cc) Cp = 125.24 (J/K)

Oxygen delta moles = -0.00145957 delta grams = -0.0467045
G = 402.88 (J) H = -44.63 (J) S = -0.37 (J/K) V = -148.43 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 940.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.03 COH = 1.56 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 43.93 (gm) density = 2.44 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -710396.73 (J) H = -574913.50 (J) S = 111.68 (J/K) V = 17.98 (cc) Cp = 58.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.44 | 0.96 | 13.87 | 0.43 | 0.00 | 1.73 | 0.22 | 0.25 | 0.00 | 0.00 | 2.14 | 2.83 | 4.61 | 0.23 | 2.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.92 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.87Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -156349.83 (J) H = -125974.76 (J) S = 25.04 (J/K) V = 3.35 (cc) Cp = 13.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.60 | 96.19 | 101.05 | 5.22 | -4.90 | 7.69 | 0.35 |

feldspar mass = 31.18 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -513643.86 (J) H = -427217.05 (J) S = 71.24 (J/K) V = 11.95 (cc) Cp = 37.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.83 | 25.38 | 6.79 |

quartz mass = 12.31 (gm) density = 2.56 (gm/cc)
SiO2
G = -203364.31 (J) H = -171097.80 (J) S = 26.60 (J/K) V = 4.81 (cc) Cp = 14.54 (J/K)

rhm-oxide mass = 0.15 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.19Al0.12Ti0.84O3
G = -1537.53 (J) H = -1174.57 (J) S = 0.30 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.18 | 9.53 | 71.02 | 3.03 | 6.24 |

Total solids mass = 55.57 (gm) density = 2.76 (gm/cc)
G = -874895.53 (J) H = -725464.17 (J) S = 123.18 (J/K) V = 20.15 (cc) Cp = 66.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.50 (gm) density = 2.61 (gm/cc)
G = -1585292.26 (J) H = -1300377.68 (J) S = 234.86 (J/K) V = 38.13 (cc) Cp = 124.77 (J/K)

Oxygen delta moles = -0.00149246 delta grams = -0.0477569
G = 408.22 (J) H = -45.10 (J) S = -0.37 (J/K) V = -150.54 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 930.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.02 COH = 1.53 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 41.52 (gm) density = 2.44 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -671173.14 (J) H = -544298.65 (J) S = 105.45 (J/K) V = 17.03 (cc) Cp = 55.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.42 | 0.91 | 13.89 | 0.40 | 0.00 | 1.61 | 0.23 | 0.24 | 0.00 | 0.00 | 2.11 | 2.75 | 4.79 | 0.24 | 2.41 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.08 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.86Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -157932.61 (J) H = -127560.64 (J) S = 25.24 (J/K) V = 3.39 (cc) Cp = 13.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.23 | 96.22 | 101.73 | 5.21 | -4.90 | 7.63 | 0.35 |

feldspar mass = 32.56 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -535535.90 (J) H = -446419.11 (J) S = 74.07 (J/K) V = 12.48 (cc) Cp = 39.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.61 | 25.23 | 7.16 |

quartz mass = 13.08 (gm) density = 2.56 (gm/cc)
SiO2
G = -215785.66 (J) H = -181940.00 (J) S = 28.13 (J/K) V = 5.12 (cc) Cp = 15.44 (J/K)

rhm-oxide mass = 0.25 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.19Al0.12Ti0.84O3
G = -2502.71 (J) H = -1917.81 (J) S = 0.49 (J/K) V = 0.05 (cc) Cp = 0.24 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.03 | 9.40 | 71.29 | 3.16 | 6.11 |

Total solids mass = 57.97 (gm) density = 2.76 (gm/cc)
G = -911756.89 (J) H = -757837.57 (J) S = 127.93 (J/K) V = 21.04 (cc) Cp = 69.01 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.50 (gm) density = 2.61 (gm/cc)
G = -1582930.02 (J) H = -1302136.22 (J) S = 233.38 (J/K) V = 38.07 (cc) Cp = 124.36 (J/K)

Oxygen delta moles = -0.00153187 delta grams = -0.0490179
G = 415.17 (J) H = -45.74 (J) S = -0.38 (J/K) V = -153.24 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 920.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = 0.02  COH = 1.50  IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 39.31 (gm)  density = 2.43 (gm/cc)  viscosity = 6.23 (log 10 poise)  (analysis in wt %)
G = -635147.93 (J)  H = -516141.33 (J)  S = 99.74 (J/K)  V = 16.15 (cc)  Cp = 52.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.38 | 0.86 | 13.91 | 0.38 | 0.00 | 1.49 | 0.24 | 0.22 | 0.00 | 0.00 | 2.09 | 2.68 | 4.96 | 0.25 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.22 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.86Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -159269.54 (J)  H = -128958.72 (J)  S = 25.40 (J/K)  V = 3.43 (cc)  Cp = 13.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.77 | 96.25 | 102.33 | 5.21 | -4.91 | 7.56 | 0.34 |

feldspar  mass = 33.84 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -555623.05 (J)  H = -464194.66 (J)  S = 76.63 (J/K)  V = 12.96 (cc)  Cp = 41.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.38 | 25.08 | 7.54 |

quartz  mass = 13.79 (gm)  density = 2.56 (gm/cc)
SiO2
G = -227196.05 (J)  H = -191972.85 (J)  S = 29.52 (J/K)  V = 5.39 (cc)  Cp = 16.26 (J/K)

rhm-oxide  mass = 0.34 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe"'0.19Al0.12Ti0.85O3
G = -3346.67 (J)  H = -2572.50 (J)  S = 0.65 (J/K)  V = 0.07 (cc)  Cp = 0.32 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.90 | 9.27 | 71.55 | 3.30 | 5.99 |

Total solids  mass = 60.18 (gm)  density = 2.75 (gm/cc)
G = -945435.31 (J)  H = -787698.73 (J)  S = 132.20 (J/K)  V = 21.85 (cc)  Cp = 71.56 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.50 (gm)  density = 2.62 (gm/cc)
G = -1580583.24 (J)  H = -1303840.06 (J)  S = 231.94 (J/K)  V = 38.01 (cc)  Cp = 123.97 (J/K)

Oxygen  delta moles = -0.00156966  delta grams = -0.0502272
G = 421.49 (J)  H = -46.31 (J)  S = -0.39 (J/K)  V = -155.71 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 910.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = 0.01  COH = 1.48  IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 37.28 (gm) density = 2.43 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -601888.74 (J) H = -490106.33 (J) S = 94.48 (J/K) V = 15.34 (cc) Cp = 49.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.33 | 0.81 | 13.93 | 0.35 | 0.00 | 1.38 | 0.25 | 0.21 | 0.00 | 0.00 | 2.06 | 2.60 | 5.13 | 0.27 | 2.68 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.34 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.85Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -160393.73 (J) H = -130193.79 (J) S = 25.53 (J/K) V = 3.46 (cc) Cp = 13.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.24 | 96.28 | 102.86 | 5.20 | -4.92 | 7.49 | 0.34 |

feldspar mass = 35.02 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -574150.25 (J) H = -480738.66 (J) S = 78.95 (J/K) V = 13.42 (cc) Cp = 42.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.14 | 24.94 | 7.92 |

quartz mass = 14.45 (gm) density = 2.56 (gm/cc)
SiO2
G = -237731.27 (J) H = -201305.80 (J) S = 30.79 (J/K) V = 5.65 (cc) Cp = 17.02 (J/K)

rhm-oxide mass = 0.41 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe"'0.18Al0.12Ti0.85O3
G = -4087.58 (J) H = -3151.84 (J) S = 0.79 (J/K) V = 0.09 (cc) Cp = 0.39 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.78 | 9.13 | 71.80 | 3.42 | 5.87 |

Total solids mass = 62.22 (gm) density = 2.75 (gm/cc)
G = -976362.83 (J) H = -815390.09 (J) S = 136.05 (J/K) V = 22.61 (cc) Cp = 73.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.49 (gm) density = 2.62 (gm/cc)
G = -1578251.57 (J) H = -1305496.42 (J) S = 230.53 (J/K) V = 37.95 (cc) Cp = 123.60 (J/K)

Oxygen delta moles = -0.00160587 delta grams = -0.0513858
G = 427.20 (J) H = -46.81 (J) S = -0.40 (J/K) V = -157.97 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 35.39 (gm) density = 2.43 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -571029.47 (J) H = -465909.52 (J) S = 89.60 (J/K) V = 14.59 (cc) Cp = 47.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

70.25 0.77 13.96 0.33 0.00 1.27 0.26 0.20 0.00 0.00 2.04 2.53 5.29 0.28 2.83 0.00 0.00 0.00 0.00

orthopyroxene mass = 12.44 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.85Fe'''0.02Ti0.00Al0.13Si1.92O6
G = -161333.83 (J) H = -131287.33 (J) S = 25.61 (J/K) V = 3.48 (cc) Cp = 14.05 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.65 96.31 103.33 5.19 -4.92 7.42 0.33

feldspar mass = 36.13 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -591325.58 (J) H = -496216.98 (J) S = 81.07 (J/K) V = 13.84 (cc) Cp = 43.83 (J/K)
albite anorthite sanidine
66.88 24.80 8.31

quartz mass = 15.06 (gm) density = 2.56 (gm/cc)
SiO2
G = -247505.49 (J) H = -210030.89 (J) S = 31.94 (J/K) V = 5.89 (cc) Cp = 17.73 (J/K)

rhm-oxide mass = 0.48 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'''0.18Al0.12Ti0.85O3
G = -4740.36 (J) H = -3666.65 (J) S = 0.92 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.66 8.98 72.06 3.55 5.75

Total solids mass = 64.11 (gm) density = 2.75 (gm/cc)
G = -1004905.26 (J) H = -841201.85 (J) S = 139.54 (J/K) V = 23.31 (cc) Cp = 76.06 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.49 (gm) density = 2.62 (gm/cc)
G = -1575934.73 (J) H = -1307111.37 (J) S = 229.15 (J/K) V = 37.90 (cc) Cp = 123.26 (J/K)

Oxygen delta moles = -0.00164053 delta grams = -0.0524949
G = 432.33 (J) H = -47.24 (J) S = -0.41 (J/K) V = -160.02 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 890.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.01 COH = 1.42 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 33.62 (gm) density = 2.42 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -542257.56 (J) H = -443307.95 (J) S = 85.07 (J/K) V = 13.89 (cc) Cp = 44.86 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.17 0.72 13.98 0.31 0.00 1.18 0.27 0.19 0.00 0.00 2.02 2.46 5.44 0.30 2.97 0.00 0.00 0.00 0.00

orthopyroxene mass = 12.53 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.85Fe'''0.02Ti0.00Al0.13Si1.92O6
G = -162114.60 (J) H = -132257.95 (J) S = 25.67 (J/K) V = 3.50 (cc) Cp = 14.14 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.01 96.34 103.75 5.19 -4.93 7.34 0.33

feldspar mass = 37.16 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.67Ca0.25Al1.25Si2.75O8
G = -607327.44 (J) H = -510772.02 (J) S = 83.01 (J/K) V = 14.23 (cc) Cp = 45.04 (J/K)
albite anorthite sanidine
66.62 24.66 8.72

quartz mass = 15.64 (gm) density = 2.56 (gm/cc)
SiO2
G = -256615.56 (J) H = -218226.32 (J) S = 33.00 (J/K) V = 6.11 (cc) Cp = 18.39 (J/K)

rhm-oxide mass = 0.54 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.18Al0.11Ti0.86O3
G = -5317.31 (J) H = -4125.84 (J) S = 1.02 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.55 8.83 72.31 3.67 5.64

Total solids mass = 65.87 (gm) density = 2.75 (gm/cc)
G = -1031374.91 (J) H = -865382.13 (J) S = 142.71 (J/K) V = 23.97 (cc) Cp = 78.07 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.49 (gm) density = 2.63 (gm/cc)
G = -1573632.47 (J) H = -1308690.08 (J) S = 227.78 (J/K) V = 37.86 (cc) Cp = 122.93 (J/K)

Oxygen delta moles = -0.00167369 delta grams = -0.0535561
G = 436.91 (J) H = -47.60 (J) S = -0.42 (J/K) V = -161.86 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 880.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.02 COH = 1.39 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 31.97 (gm) density = 2.42 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -515303.86 (J) H = -422092.01 (J) S = 80.83 (J/K) V = 13.23 (cc) Cp = 42.67 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.06 0.68 14.01 0.29 0.00 1.09 0.28 0.18 0.00 0.00 2.00 2.39 5.59 0.31 3.13 0.00 0.00 0.00 0.00

orthopyroxene mass = 12.61 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.85Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -162757.50 (J) H = -133121.76 (J) S = 25.70 (J/K) V = 3.52 (cc) Cp = 14.21 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.32 96.37 104.12 5.18 -4.94 7.27 0.32

feldspar mass = 38.14 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -622310.18 (J) H = -524527.29 (J) S = 84.80 (J/K) V = 14.61 (cc) Cp = 46.18 (J/K)

albite anorthite sanidine
66.34 24.53 9.13

quartz mass = 16.18 (gm) density = 2.56 (gm/cc)
SiO2
G = -265144.41 (J) H = -225959.09 (J) S = 33.98 (J/K) V = 6.33 (cc) Cp = 19.00 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.17Al0.11Ti0.86O3
G = -5828.64 (J) H = -4536.83 (J) S = 1.12 (J/K) V = 0.13 (cc) Cp = 0.56 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.44 8.67 72.56 3.79 5.53

Total solids mass = 67.52 (gm) density = 2.75 (gm/cc)
G = -1056040.73 (J) H = -888144.96 (J) S = 145.60 (J/K) V = 24.58 (cc) Cp = 79.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.49 (gm) density = 2.63 (gm/cc)
G = -1571344.59 (J) H = -1310236.98 (J) S = 226.43 (J/K) V = 37.81 (cc) Cp = 122.62 (J/K)

Oxygen delta moles = -0.00170541 delta grams = -0.0545712
G = 440.94 (J) H = -47.89 (J) S = -0.42 (J/K) V = -163.51 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 30.42 (gm) density = 2.41 (gm/cc) viscosity = 6.20 (log 10 poise) (analysis in wt %)
G = -489934.55 (J) H = -402079.22 (J) S = 76.85 (J/K) V = 12.61 (cc) Cp = 40.62 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.94 0.64 14.04 0.27 0.00 1.00 0.29 0.17 0.00 0.00 1.99 2.32 5.73 0.33 3.29 0.00 0.00 0.00 0.00

orthopyroxene mass = 12.68 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.84Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -163281.06 (J) H = -133892.74 (J) S = 25.71 (J/K) V = 3.54 (cc) Cp = 14.27 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.60 96.40 104.45 5.18 -4.95 7.20 0.31

feldspar mass = 39.07 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.66Ca0.24Al1.24Si2.76O8
G = -636408.63 (J) H = -537590.89 (J) S = 86.44 (J/K) V = 14.96 (cc) Cp = 47.26 (J/K)
albite anorthite sanidine
66.04 24.39 9.56

quartz mass = 16.69 (gm) density = 2.56 (gm/cc)
SiO2
G = -273163.77 (J) H = -233287.23 (J) S = 34.88 (J/K) V = 6.53 (cc) Cp = 19.59 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe"'0.17Al0.11Ti0.86O3
G = -6282.88 (J) H = -4905.80 (J) S = 1.20 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.34 | 8.51 | 72.81 | 3.91 | 5.43 |

Total solids mass = 69.07 (gm) density = 2.74 (gm/cc)
G = -1079136.34 (J) H = -909676.65 (J) S = 148.24 (J/K) V = 25.16 (cc) Cp = 81.71 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.49 (gm) density = 2.63 (gm/cc)
G = -1569070.89 (J) H = -1311755.88 (J) S = 225.09 (J/K) V = 37.77 (cc) Cp = 122.33 (J/K)

Oxygen delta moles = -0.00173576 delta grams = -0.0555421
G = 444.48 (J) H = -48.13 (J) S = -0.43 (J/K) V = -164.97 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 28.88 (gm) density = 2.41 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -464882.19 (J) H = -382194.25 (J) S = 72.97 (J/K) V = 11.99 (cc) Cp = 38.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.89 | 0.60 | 13.93 | 0.25 | 0.00 | 0.91 | 0.30 | 0.16 | 0.00 | 0.00 | 1.98 | 2.32 | 5.85 | 0.35 | 3.46 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.88 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.23)3Al2Si3O12
G = -11816.30 (J) H = -9871.40 (J) S = 1.72 (J/K) V = 0.22 (cc) Cp = 0.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.96 | 17.51 | 22.52 |

orthopyroxene mass = 12.15 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.86Fe"'0.02Ti0.00Al0.12Si1.93O6
G = -156637.19 (J) H = -128839.88 (J) S = 24.53 (J/K) V = 3.40 (cc) Cp = 13.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.22 | 96.33 | 103.49 | 5.00 | -4.78 | 6.87 | 0.31 |

feldspar mass = 39.60 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.66Ca0.24Al1.24Si2.76O8
G = -643919.53 (J) H = -545096.41 (J) S = 87.21 (J/K) V = 15.17 (cc) Cp = 47.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.99 | 23.81 | 10.20 |

quartz mass = 17.30 (gm) density = 2.56 (gm/cc)
SiO2
G = -282859.69 (J) H = -242078.82 (J) S = 35.99 (J/K) V = 6.77 (cc) Cp = 20.29 (J/K)

rhm-oxide mass = 0.68 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.17Al0.11Ti0.86O3
G = -6680.71 (J) H = -5234.02 (J) S = 1.28 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.45 | 8.26 | 72.98 | 4.06 | 5.26 |

Total solids mass = 70.60 (gm) density = 2.75 (gm/cc)
G = -1101913.42 (J) H = -931120.53 (J) S = 150.72 (J/K) V = 25.70 (cc) Cp = 83.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.49 (gm) density = 2.64 (gm/cc)
G = -1566795.61 (J) H = -1313314.77 (J) S = 223.70 (J/K) V = 37.69 (cc) Cp = 121.99 (J/K)

Oxygen delta moles = -0.00179481 delta grams = -0.0574319
G = 455.15 (J) H = -49.13 (J) S = -0.45 (J/K) V = -169.10 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 850.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.05 COH = 1.30 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 27.36 (gm) density = 2.40 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -440116.85 (J) H = -362436.53 (J) S = 69.16 (J/K) V = 11.39 (cc) Cp = 36.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.83 | 0.57 | 13.80 | 0.23 | 0.00 | 0.82 | 0.31 | 0.16 | 0.00 | 0.00 | 1.97 | 2.35 | 5.94 | 0.37 | 3.65 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.18 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.59Mg0.23)3Al2Si3O12
G = -29394.84 (J) H = -24621.96 (J) S = 4.25 (J/K) V = 0.55 (cc) Cp = 2.35 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.47 | 17.93 | 22.60 |

orthopyroxene mass = 11.29 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.88Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -145941.12 (J) H = -120444.01 (J) S = 22.70 (J/K) V = 3.16 (cc) Cp = 12.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.03 | 96.26 | 101.79 | 4.78 | -4.57 | 6.45 | 0.32 |

clinopyroxene mass = 0.09 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.41Mg0.53Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -1307.36 (J) H = -1102.38 (J) S = 0.18 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.36 | 11.90 | 40.95 | 9.50 | -0.66 | 6.61 | 7.36 |

feldspar mass = 39.88 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.66Ca0.23Al1.23Si2.77O8
G = -647358.70 (J) H = -549148.46 (J) S = 87.44 (J/K) V = 15.28 (cc) Cp = 48.18 (J/K)

albite anorthite sanidine
66.10 22.86 11.03

quartz mass = 17.97 (gm) density = 2.56 (gm/cc)
SiO2
G = -293400.53 (J) H = -251629.61 (J) S = 37.19 (J/K) V = 7.03 (cc) Cp = 21.05 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.16Al0.10Ti0.87O3
G = -7012.72 (J) H = -5513.52 (J) S = 1.33 (J/K) V = 0.15 (cc) Cp = 0.67 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.68 7.94 73.06 4.24 5.08

Total solids mass = 72.12 (gm) density = 2.75 (gm/cc)
G = -1124415.26 (J) H = -952459.95 (J) S = 153.10 (J/K) V = 26.21 (cc) Cp = 85.07 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.49 (gm) density = 2.65 (gm/cc)
G = -1564532.11 (J) H = -1314896.48 (J) S = 222.26 (J/K) V = 37.59 (cc) Cp = 121.64 (J/K)

Oxygen delta moles = -0.00185857 delta grams = -0.059472
G = 466.71 (J) H = -50.22 (J) S = -0.46 (J/K) V = -173.56 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 840.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.06 COH = 1.27 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 25.49 (gm) density = 2.40 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -409929.62 (J) H = -338021.42 (J) S = 64.60 (J/K) V = 10.63 (cc) Cp = 34.11 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.72 0.53 13.72 0.22 0.00 0.75 0.33 0.16 0.00 0.00 1.93 2.44 5.90 0.39 3.92 0.00 0.00 0.00 0.00

garnet mass = 3.62 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.59Mg0.23)3Al2Si3O12
G = -48760.46 (J) H = -40946.56 (J) S = 7.02 (J/K) V = 0.92 (cc) Cp = 3.90 (J/K)
almandine grossular pyrope
59.14 17.85 23.01

orthopyroxene mass = 10.21 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -132511.31 (J) H = -109737.53 (J) S = 20.46 (J/K) V = 2.87 (cc) Cp = 11.54 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.78 96.32 99.79 4.65 -4.45 6.15 0.32

clinopyroxene mass = 0.40 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.39Mg0.54Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -5716.36 (J) H = -4835.33 (J) S = 0.79 (J/K) V = 0.12 (cc) Cp = 0.44 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
27.06 11.29 39.05 9.57 -0.59 6.14 7.49

feldspar mass = 39.26 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.67Ca0.22Al1.22Si2.78O8
G = -636355.02 (J) H = -540955.70 (J) S = 85.70 (J/K) V = 15.05 (cc) Cp = 47.42 (J/K)
albite anorthite sanidine
66.69 21.96 11.34

feldspar mass = 1.01 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.03Al1.03Si2.97O8
G = -15958.51 (J) H = -13533.78 (J) S = 2.18 (J/K) V = 0.40 (cc) Cp = 1.20 (J/K)
albite anorthite sanidine
32.68 2.69 64.63

quartz mass = 18.75 (gm) density = 2.56 (gm/cc)
SiO2
G = -305729.77 (J) H = -262754.99 (J) S = 38.61 (J/K) V = 7.33 (cc) Cp = 21.94 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.15Al0.10Ti0.87O3
G = -7329.47 (J) H = -5783.78 (J) S = 1.39 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.98 7.59 73.03 4.42 4.98

Total solids mass = 74.00 (gm) density = 2.76 (gm/cc)
G = -1152360.90 (J) H = -978547.68 (J) S = 156.15 (J/K) V = 26.85 (cc) Cp = 87.13 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.65 (gm/cc)
G = -1562290.53 (J) H = -1316569.10 (J) S = 220.74 (J/K) V = 37.48 (cc) Cp = 121.24 (J/K)

Oxygen delta moles = -0.00190864 delta grams = -0.0610742
G = 474.56 (J) H = -50.90 (J) S = -0.47 (J/K) V = -176.65 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 23.47 (gm) density = 2.39 (gm/cc) viscosity = 5.86 (log 10 poise) (analysis in wt %)
G = -377712.99 (J) H = -311765.08 (J) S = 59.78 (J/K) V = 9.83 (cc) Cp = 31.49 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.57 0.48 13.60 0.20 0.00 0.69 0.35 0.16 0.00 0.00 1.92 2.58 5.75 0.43 4.26 0.00 0.00 0.00 0.00

garnet mass = 4.97 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.59Mg0.23)3Al2Si3O12
G = -66984.80 (J) H = -56392.86 (J) S = 9.60 (J/K) V = 1.26 (cc) Cp = 5.36 (J/K)

almandine grossular pyrope
58.79 17.74 23.47

orthopyroxene mass = 9.20 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.92Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -119911.37 (J) H = -99645.96 (J) S = 18.37 (J/K) V = 2.59 (cc) Cp = 10.42 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-100.43 96.37 97.68 4.52 -4.33 5.86 0.32

clinopyroxene mass = 0.66 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.37Mg0.56Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -9570.04 (J) H = -8120.40 (J) S = 1.31 (J/K) V = 0.19 (cc) Cp = 0.73 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
29.72 10.70 37.13 9.66 -0.53 5.68 7.64

feldspar mass = 38.15 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.67Ca0.21Al1.21Si2.79O8
G = -617543.61 (J) H = -526107.11 (J) S = 82.89 (J/K) V = 14.63 (cc) Cp = 46.09 (J/K)
albite anorthite sanidine
67.50 21.39 11.11

feldspar mass = 2.69 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.03Al1.03Si2.97O8
G = -42354.72 (J) H = -36000.10 (J) S = 5.76 (J/K) V = 1.06 (cc) Cp = 3.19 (J/K)
albite anorthite sanidine
32.45 2.51 65.04

quartz mass = 19.55 (gm) density = 2.56 (gm/cc)
SiO2
G = -318341.33 (J) H = -274167.42 (J) S = 40.04 (J/K) V = 7.64 (cc) Cp = 22.85 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.10Fe'"0.14Al0.10Ti0.88O3
G = -7648.07 (J) H = -6057.42 (J) S = 1.44 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.31 7.24 72.98 4.58 4.89

Total solids mass = 76.01 (gm) density = 2.76 (gm/cc)
G = -1182353.92 (J) H = -1006491.28 (J) S = 159.42 (J/K) V = 27.55 (cc) Cp = 89.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.66 (gm/cc)
G = -1560066.91 (J) H = -1318256.36 (J) S = 219.20 (J/K) V = 37.37 (cc) Cp = 120.84 (J/K)

Oxygen delta moles = -0.00195406 delta grams = -0.0625277
G = 481.02 (J) H = -51.42 (J) S = -0.48 (J/K) V = -179.23 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 820.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.08 COH = 1.21
IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 21.62 (gm) density = 2.38 (gm/cc) viscosity = 5.70 (log 10 poise) (analysis in wt %)
G = -347994.14 (J) H = -287487.15 (J) S = 55.35 (J/K) V = 9.08 (cc) Cp = 29.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.38 | 0.44 | 13.49 | 0.19 | 0.00 | 0.64 | 0.38 | 0.16 | 0.00 | 0.00 | 1.91 | 2.73 | 5.60 | 0.46 | 4.62 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.20 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -83499.14 (J) H = -70472.80 (J) S = 11.92 (J/K) V = 1.57 (cc) Cp = 6.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.44 | 17.64 | 23.92 |

orthopyroxene mass = 8.29 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.95Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -108417.89 (J) H = -90401.39 (J) S = 16.48 (J/K) V = 2.34 (cc) Cp = 9.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.13 | 96.43 | 95.60 | 4.40 | -4.21 | 5.58 | 0.33 |

clinopyroxene mass = 0.90 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.35Mg0.57Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -13133.66 (J) H = -11178.37 (J) S = 1.79 (J/K) V = 0.27 (cc) Cp = 1.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.24 | 10.16 | 35.28 | 9.74 | -0.46 | 5.25 | 7.78 |

feldspar mass = 37.15 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -600580.21 (J) H = -512768.52 (J) S = 80.33 (J/K) V = 14.25 (cc) Cp = 44.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.29 | 20.84 | 10.87 |

feldspar mass = 4.22 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.02Al1.02Si2.98O8
G = -66264.61 (J) H = -56449.11 (J) S = 8.98 (J/K) V = 1.66 (cc) Cp = 4.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.19 | 2.33 | 65.48 |

quartz mass = 20.29 (gm) density = 2.56 (gm/cc)
SiO2
G = -330064.17 (J) H = -284857.69 (J) S = 41.35 (J/K) V = 7.93 (cc) Cp = 23.69 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.11Fe'"0.14Al0.10Ti0.88O3
G = -7907.39 (J) H = -6285.60 (J) S = 1.48 (J/K) V = 0.17 (cc) Cp = 0.75 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.64 | 6.91 | 72.92 | 4.72 | 4.80 |

Total solids mass = 77.86 (gm) density = 2.76 (gm/cc)
G = -1209867.06 (J) H = -1032413.48 (J) S = 162.33 (J/K) V = 28.19 (cc) Cp = 91.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.67 (gm/cc)
G = -1557861.20 (J) H = -1319900.64 (J) S = 217.68 (J/K) V = 37.27 (cc) Cp = 120.48 (J/K)

Oxygen delta moles = -0.00199457 delta grams = -0.063824
G = 486.07 (J) H = -51.79 (J) S = -0.49 (J/K) V = -181.28 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 810.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.09 COH = 1.18 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 19.89 (gm) density = 2.37 (gm/cc) viscosity = 5.53 (log 10 poise) (analysis in wt %)
G = -320339.07 (J) H = -264836.11 (J) S = 51.24 (J/K) V = 8.39 (cc) Cp = 26.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.12 | 0.39 | 13.37 | 0.18 | 0.00 | 0.59 | 0.40 | 0.16 | 0.00 | 0.00 | 1.91 | 2.90 | 5.44 | 0.50 | 5.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.32 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -98541.38 (J) H = -83376.44 (J) S = 14.00 (J/K) V = 1.86 (cc) Cp = 7.88 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.10 | 17.52 | 24.38 |

orthopyroxene mass = 7.46 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.97Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -97873.92 (J) H = -81883.20 (J) S = 14.76 (J/K) V = 2.11 (cc) Cp = 8.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.88 | 96.49 | 93.56 | 4.27 | -4.09 | 5.32 | 0.33 |

clinopyroxene mass = 1.13 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.34Mg0.59Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -16449.14 (J) H = -14042.30 (J) S = 2.22 (J/K) V = 0.33 (cc) Cp = 1.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.64 | 9.65 | 33.51 | 9.81 | -0.38 | 4.83 | 7.93 |

feldspar mass = 36.25 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.69Ca0.20Al1.20Si2.80O8
G = -585266.90 (J) H = -500780.55 (J) S = 78.00 (J/K) V = 13.90 (cc) Cp = 43.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.06 | 20.31 | 10.62 |

feldspar mass = 5.62 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -88023.28 (J) H = -75152.73 (J) S = 11.88 (J/K) V = 2.21 (cc) Cp = 6.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.89 | 2.16 | 65.95 |

quartz mass = 20.99 (gm) density = 2.56 (gm/cc)
SiO2
G = -341062.21 (J) H = -294962.68 (J) S = 42.56 (J/K) V = 8.21 (cc) Cp = 24.48 (J/K)

rhm-oxide mass = 0.83 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.11Fe'''0.13Al0.09Ti0.89O3
G = -8116.87 (J) H = -6475.35 (J) S = 1.52 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.96 | 6.60 | 72.86 | 4.86 | 4.72 |

Total solids mass = 79.59 (gm) density = 2.76 (gm/cc)
G = -1235333.70 (J) H = -1056673.25 (J) S = 164.95 (J/K) V = 28.80 (cc) Cp = 93.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.68 (gm/cc)
G = -1555672.77 (J) H = -1321509.36 (J) S = 216.19 (J/K) V = 37.18 (cc) Cp = 120.14 (J/K)

Oxygen delta moles = -0.00203091 delta grams = -0.0649866
G = 489.92 (J) H = -52.01 (J) S = -0.50 (J/K) V = -182.90 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 18.24 (gm) density = 2.36 (gm/cc) viscosity = 5.31 (log 10 poise) (analysis in wt %)
G = -293719.28 (J) H = -242932.85 (J) S = 47.32 (J/K) V = 7.72 (cc) Cp = 24.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.80 | 0.35 | 13.19 | 0.17 | 0.00 | 0.56 | 0.46 | 0.16 | 0.00 | 0.00 | 1.92 | 3.12 | 5.24 | 0.55 | 5.48 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.14 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -109500.60 (J) H = -92870.55 (J) S = 15.50 (J/K) V = 2.07 (cc) Cp = 8.76 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.02 | 17.42 | 24.55 |

orthopyroxene mass = 7.10 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.92Mg0.99Fe'''0.01Ti0.00Al0.10Si1.95O6
G = -93294.06 (J) H = -78286.33 (J) S = 13.98 (J/K) V = 2.01 (cc) Cp = 8.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.56 | 96.57 | 92.39 | 4.14 | -3.97 | 5.10 | 0.34 |

clinopyroxene mass = 0.59 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.32Mg0.60Fe'''0.04Ti0.05Al0.22Si1.86O6
G = -8543.65 (J) H = -7313.66 (J) S = 1.15 (J/K) V = 0.17 (cc) Cp = 0.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.45 | 9.25 | 32.29 | 9.70 | -0.27 | 4.48 | 8.11 |

clinopyroxene mass = 0.84 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.26Mg0.33Fe'''0.04Ti0.39Al0.73Si1.26O6
G = -12160.79 (J) H = -10449.52 (J) S = 1.59 (J/K) V = 0.23 (cc) Cp = 0.91 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-9.58 1.93 26.21 69.68 8.51 -4.09 7.35

feldspar mass = 35.27 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -568794.45 (J) H = -487733.83 (J) S = 75.54 (J/K) V = 13.53 (cc) Cp = 42.69 (J/K)
albite anorthite sanidine
69.94 19.63 10.43

feldspar mass = 6.96 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -108886.79 (J) H = -93173.12 (J) S = 14.64 (J/K) V = 2.74 (cc) Cp = 8.22 (J/K)
albite anorthite sanidine
31.68 2.00 66.32

quartz mass = 21.71 (gm) density = 2.56 (gm/cc)
SiO2
G = -352287.05 (J) H = -305303.04 (J) S = 43.78 (J/K) V = 8.49 (cc) Cp = 25.29 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.11Fe'"0.13Al0.09Ti0.89O3
G = -6300.06 (J) H = -5042.63 (J) S = 1.17 (J/K) V = 0.14 (cc) Cp = 0.59 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.14 6.38 72.71 5.15 4.61

Total solids mass = 81.24 (gm) density = 2.77 (gm/cc)
G = -1259767.46 (J) H = -1080172.68 (J) S = 167.35 (J/K) V = 29.38 (cc) Cp = 95.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.68 (gm/cc)
G = -1553486.74 (J) H = -1323105.53 (J) S = 214.68 (J/K) V = 37.09 (cc) Cp = 119.85 (J/K)

Oxygen delta moles = -0.00209127 delta grams = -0.0669181
G = 499.33 (J) H = -52.82 (J) S = -0.51 (J/K) V = -186.59 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 790.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.11 COH = 1.11 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 16.65 (gm) density = 2.35 (gm/cc) viscosity = 5.07 (log 10 poise) (analysis in wt %)
G = -268350.78 (J) H = -221987.23 (J) S = 43.61 (J/K) V = 7.08 (cc) Cp = 22.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.39 | 0.31 | 13.00 | 0.17 | 0.00 | 0.54 | 0.53 | 0.16 | 0.00 | 0.00 | 1.93 | 3.37 | 5.01 | 0.60 | 6.00 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.87 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -119122.63 (J) H = -101267.44 (J) S = 16.79 (J/K) V = 2.25 (cc) Cp = 9.53 (J/K)

almandine grossular pyrope
58.04 17.25 24.71

orthopyroxene mass = 6.81 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg1.00Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -89620.90 (J) H = -75423.40 (J) S = 13.35 (J/K) V = 1.93 (cc) Cp = 7.75 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-93.48 96.67 91.41 4.03 -3.87 4.90 0.34

clinopyroxene mass = 1.76 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.26Mg0.34Fe'"0.04Ti0.40Al0.74Si1.25O6
G = -25499.14 (J) H = -21965.72 (J) S = 3.32 (J/K) V = 0.49 (cc) Cp = 1.90 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-9.67 1.84 25.63 70.53 8.62 -4.50 7.55

feldspar mass = 34.34 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -552997.46 (J) H = -475204.63 (J) S = 73.17 (J/K) V = 13.17 (cc) Cp = 41.62 (J/K)
albite anorthite sanidine
70.85 18.90 10.25

feldspar mass = 8.21 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -128269.91 (J) H = -110003.33 (J) S = 17.18 (J/K) V = 3.23 (cc) Cp = 9.70 (J/K)
albite anorthite sanidine
31.50 1.84 66.67

quartz mass = 22.42 (gm) density = 2.56 (gm/cc)
SiO2
G = -363259.78 (J) H = -315464.00 (J) S = 44.96 (J/K) V = 8.77 (cc) Cp = 26.08 (J/K)

rhm-oxide mass = 0.43 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.11Fe'"0.12Al0.09Ti0.89O3
G = -4195.77 (J) H = -3369.25 (J) S = 0.78 (J/K) V = 0.09 (cc) Cp = 0.39 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.28 6.19 72.55 5.47 4.51

Total solids mass = 82.82 (gm) density = 2.77 (gm/cc)
G = -1282965.59 (J) H = -1102697.77 (J) S = 169.56 (J/K) V = 29.93 (cc) Cp = 96.98 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.69 (gm/cc)
G = -1551316.37 (J) H = -1324685.00 (J) S = 213.17 (J/K) V = 37.01 (cc) Cp = 119.59 (J/K)

Oxygen delta moles = -0.00215081 delta grams = -0.0688235
G = 508.26 (J) H = -53.57 (J) S = -0.53 (J/K) V = -190.12 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 780.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.12 COH = 1.07
IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 15.16 (gm) density = 2.34 (gm/cc) viscosity = 4.81 (log 10 poise) (analysis in wt %)
G = -244408.59 (J) H = -202173.21 (J) S = 40.10 (J/K) V = 6.47 (cc) Cp = 20.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.84 | 0.27 | 12.87 | 0.16 | 0.00 | 0.51 | 0.59 | 0.16 | 0.00 | 0.00 | 1.94 | 3.62 | 4.78 | 0.66 | 6.60 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.69 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -130068.16 (J) H = -110834.86 (J) S = 18.26 (J/K) V = 2.46 (cc) Cp = 10.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.92 | 16.98 | 25.10 |

orthopyroxene mass = 6.24 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg1.02Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -82349.07 (J) H = -69517.56 (J) S = 12.18 (J/K) V = 1.77 (cc) Cp = 7.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.86 | 96.78 | 89.88 | 3.93 | -3.77 | 4.71 | 0.34 |

clinopyroxene mass = 2.05 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.25Mg0.34Fe'"0.04Ti0.40Al0.75Si1.25O6
G = -29784.51 (J) H = -25723.60 (J) S = 3.86 (J/K) V = 0.57 (cc) Cp = 2.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.80 | 1.75 | 24.85 | 71.69 | 8.70 | -4.90 | 7.72 |

feldspar mass = 33.57 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.72Ca0.18Al1.18Si2.82O8
G = -540026.19 (J) H = -465056.64 (J) S = 71.19 (J/K) V = 12.88 (cc) Cp = 40.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.70 | 18.26 | 10.04 |

feldspar mass = 9.34 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -145600.14 (J) H = -125143.31 (J) S = 19.42 (J/K) V = 3.67 (cc) Cp = 11.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.22 | 1.69 | 67.09 |

quartz mass = 23.07 (gm) density = 2.56 (gm/cc)
SiO2
G = -373434.46 (J) H = -324969.00 (J) S = 46.02 (J/K) V = 9.02 (cc) Cp = 26.81 (J/K)

rhm-oxide mass = 0.36 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.72Mg0.12Fe'"0.12Al0.09Ti0.90O3
G = -3502.36 (J) H = -2822.01 (J) S = 0.65 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.53 | 5.94 | 72.44 | 5.66 | 4.44 |

Total solids mass = 84.32 (gm) density = 2.77 (gm/cc)
G = -1304764.90 (J) H = -1124066.96 (J) S = 171.58 (J/K) V = 30.46 (cc) Cp = 98.69 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.69 (gm/cc)
G = -1549173.48 (J) H = -1326240.17 (J) S = 211.68 (J/K) V = 36.93 (cc) Cp = 119.37 (J/K)

Oxygen delta moles = -0.00218641 delta grams = -0.0699625
G = 511.31 (J) H = -53.69 (J) S = -0.54 (J/K) V = -191.45 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 770.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.14 COH = 1.04 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 12.30 (gm) density = 2.33 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -198368.96 (J) H = -163876.67 (J) S = 33.07 (J/K) V = 5.29 (cc) Cp = 16.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.22 | 0.21 | 12.16 | 0.19 | 0.00 | 0.55 | 0.62 | 0.14 | 0.00 | 0.00 | 2.09 | 4.23 | 4.38 | 0.81 | 7.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.07 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -174292.82 (J) H = -148787.71 (J) S = 24.45 (J/K) V = 3.31 (cc) Cp = 13.99 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.37 | 17.28 | 23.34 |

orthopyroxene mass = 1.61 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -20955.53 (J) H = -17709.12 (J) S = 3.11 (J/K) V = 0.45 (cc) Cp = 1.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.25 | 96.97 | 94.17 | 3.80 | -3.67 | 4.64 | 0.34 |

clinopyroxene mass = 2.00 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.32Mg0.60Fe'"0.04Ti0.04Al0.21Si1.87O6
G = -29142.31 (J) H = -25121.61 (J) S = 3.85 (J/K) V = 0.59 (cc) Cp = 2.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.47 | 8.42 | 31.65 | 8.58 | 0.33 | 3.61 | 8.94 |

biotite mass = 2.11 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -33392.74 (J) H = -28614.57 (J) S = 4.58 (J/K) V = 0.76 (cc) Cp = 2.66 (J/K)

| annite | phlogopite |
|---|---|
| 4.33 | 95.67 |

feldspar mass = 33.38 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -536155.11 (J) H = -462674.86 (J) S = 70.44 (J/K) V = 12.82 (cc) Cp = 40.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.06 | 16.81 | 10.12 |

feldspar mass = 8.91 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -138704.24 (J) H = -119478.32 (J) S = 18.43 (J/K) V = 3.50 (cc) Cp = 10.53 (J/K)

albite anorthite sanidine
31.54 1.53 66.94

quartz mass = 25.20 (gm) density = 2.56 (gm/cc)
SiO2
G = -407313.53 (J) H = -355179.91 (J) S = 49.98 (J/K) V = 9.85 (cc) Cp = 29.25 (J/K)

rhm-oxide mass = 0.90 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.11Fe'"0.12Al0.08Ti0.90O3
G = -8776.38 (J) H = -7084.40 (J) S = 1.62 (J/K) V = 0.19 (cc) Cp = 0.83 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.58 6.13 73.87 5.32 4.10

Total solids mass = 87.18 (gm) density = 2.77 (gm/cc)
G = -1348732.65 (J) H = -1164650.50 (J) S = 176.47 (J/K) V = 31.48 (cc) Cp = 101.98 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.71 (gm/cc)
G = -1547101.62 (J) H = -1328527.17 (J) S = 209.53 (J/K) V = 36.77 (cc) Cp = 118.86 (J/K)

Oxygen delta moles = -0.00211962 delta grams = -0.0678252
G = 490.49 (J) H = -51.31 (J) S = -0.52 (J/K) V = -183.84 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.40 (gm) density = 2.31 (gm/cc) viscosity = 3.97 (log 10 poise) (analysis in wt %)
G = -167782.62 (J) H = -138367.10 (J) S = 28.47 (J/K) V = 4.50 (cc) Cp = 14.39 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.24 0.17 11.63 0.21 0.00 0.58 0.73 0.12 0.00 0.00 2.24 4.78 3.99 0.96 8.34 0.00 0.00 0.00 0.00

garnet mass = 14.37 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.22)3Al2Si3O12
G = -190460.01 (J) H = -162900.36 (J) S = 26.68 (J/K) V = 3.63 (cc) Cp = 15.31 (J/K)
almandine grossular pyrope
60.57 17.65 21.77

clinopyroxene mass = 2.04 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.33Mg0.58Fe'"0.04Ti0.04Al0.21Si1.88O6
G = -29578.00 (J) H = -25540.83 (J) S = 3.91 (J/K) V = 0.60 (cc) Cp = 2.25 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
37.28 8.00 33.02 8.22 0.69 3.44 9.35

biotite mass = 3.11 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -48982.75 (J) H = -42052.92 (J) S = 6.71 (J/K) V = 1.12 (cc) Cp = 3.91 (J/K)

annite phlogopite
5.17 94.83

feldspar mass = 33.12 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -531279.20 (J) H = -459443.01 (J) S = 69.53 (J/K) V = 12.72 (cc) Cp = 40.55 (J/K)
albite anorthite sanidine
74.05 15.96 9.99

feldspar mass = 9.08 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.01Al1.01Si2.99O8
G = -141190.19 (J) H = -121888.51 (J) S = 18.68 (J/K) V = 3.57 (cc) Cp = 10.74 (J/K)
albite anorthite sanidine
31.37 1.38 67.24

quartz mass = 26.44 (gm) density = 2.56 (gm/cc)
SiO2
G = -426848.76 (J) H = -372977.41 (J) S = 52.14 (J/K) V = 10.34 (cc) Cp = 30.65 (J/K)

rhm-oxide mass = 0.92 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.10Fe'"0.12Al0.08Ti0.90O3
G = -8888.75 (J) H = -7190.59 (J) S = 1.64 (J/K) V = 0.20 (cc) Cp = 0.84 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.79 6.20 74.74 5.38 3.88

Total solids mass = 89.08 (gm) density = 2.77 (gm/cc)
G = -1377227.67 (J) H = -1191993.63 (J) S = 179.29 (J/K) V = 32.18 (cc) Cp = 104.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.71 (gm/cc)
G = -1545010.29 (J) H = -1330360.72 (J) S = 207.76 (J/K) V = 36.68 (cc) Cp = 118.65 (J/K)

Oxygen delta moles = -0.00213 delta grams = -0.0681575
G = 487.68 (J) H = -50.82 (J) S = -0.52 (J/K) V = -182.97 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 750.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.16 COH = 0.97 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 8.87 (gm) density = 2.29 (gm/cc) viscosity = 3.46 (log 10 poise) (analysis in wt %)
G = -143223.99 (J) H = -117777.80 (J) S = 24.87 (J/K) V = 3.88 (cc) Cp = 12.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.77 | 0.13 | 11.16 | 0.22 | 0.00 | 0.61 | 0.93 | 0.11 | 0.00 | 0.00 | 2.42 | 5.38 | 3.57 | 1.13 | 9.57 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.58 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.20)3Al2Si3O12
G = -192333.12 (J) H = -164838.93 (J) S = 26.87 (J/K) V = 3.67 (cc) Cp = 15.49 (J/K)

almandine grossular pyrope
61.46 18.12 20.42

clinopyroxene mass = 0.95 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.83Fe"0.34Mg0.56Fe'"0.04Ti0.05Al0.21Si1.88O6
G = -13686.20 (J) H = -11840.27 (J) S = 1.80 (J/K) V = 0.28 (cc) Cp = 1.04 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
36.47 7.47 33.97 8.11 1.01 3.27 9.71

clinopyroxene mass = 1.18 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.28Mg0.30Fe'"0.04Ti0.40Al0.72Si1.26O6
G = -16915.90 (J) H = -14685.90 (J) S = 2.18 (J/K) V = 0.33 (cc) Cp = 1.27 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-12.28 1.41 28.41 69.57 9.96 -5.90 8.83

biotite mass = 3.54 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -55464.41 (J) H = -47708.88 (J) S = 7.58 (J/K) V = 1.27 (cc) Cp = 4.44 (J/K)
annite phlogopite
5.95 94.05

feldspar mass = 32.82 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.75Ca0.15Al1.15Si2.85O8
G = -525881.88 (J) H = -455759.36 (J) S = 68.54 (J/K) V = 12.61 (cc) Cp = 40.43 (J/K)
albite anorthite sanidine
74.84 15.43 9.73

feldspar mass = 9.62 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -149339.20 (J) H = -129209.10 (J) S = 19.67 (J/K) V = 3.78 (cc) Cp = 11.40 (J/K)
albite anorthite sanidine
30.93 1.26 67.81

quartz mass = 27.28 (gm) density = 2.56 (gm/cc)
SiO2
G = -439921.97 (J) H = -385185.56 (J) S = 53.50 (J/K) V = 10.67 (cc) Cp = 31.59 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.75Mg0.09Fe'"0.12Al0.07Ti0.90O3
G = -6141.87 (J) H = -4980.45 (J) S = 1.14 (J/K) V = 0.14 (cc) Cp = 0.58 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.17 6.20 75.27 5.63 3.72

Total solids mass = 90.61 (gm) density = 2.77 (gm/cc)
G = -1399684.55 (J) H = -1214208.45 (J) S = 181.28 (J/K) V = 32.75 (cc) Cp = 106.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.48 (gm) density = 2.72 (gm/cc)
G = -1542908.54 (J) H = -1331986.25 (J) S = 206.15 (J/K) V = 36.62 (cc) Cp = 118.63 (J/K)

Oxygen delta moles = -0.00219156 delta grams = -0.0701272
G = 496.41 (J) H = -51.52 (J) S = -0.54 (J/K) V = -186.43 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 740.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = -0.17  COH = 0.93
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 7.35 (gm)  density = 2.26 (gm/cc)  viscosity = 2.82 (log 10 poise)  (analysis in wt %)
G = -118902.99 (J)  H = -97303.28 (J)  S = 21.32 (J/K)  V = 3.25 (cc)  Cp = 10.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.50 | 0.10 | 10.64 | 0.25 | 0.00 | 0.65 | 1.22 | 0.09 | 0.00 | 0.00 | 2.66 | 6.13 | 3.05 | 1.36 | 11.34 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.74 (gm)  density = 3.98 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.62Mg0.19)3Al2Si3O12
G = -193595.73 (J)  H = -166260.29 (J)  S = 26.98 (J/K)  V = 3.71 (cc)  Cp = 15.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.33 | 18.41 | 19.26 |

clinopyroxene  mass = 2.28 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.29Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -32620.09 (J)  H = -28375.94 (J)  S = 4.19 (J/K)  V = 0.64 (cc)  Cp = 2.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.51 | 1.29 | 29.20 | 69.95 | 10.20 | -6.21 | 9.06 |

biotite  mass = 3.91 (gm)  density = 2.79 (gm/cc)  (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -60965.37 (J)  H = -52540.94 (J)  S = 8.32 (J/K)  V = 1.40 (cc)  Cp = 4.88 (J/K)

| annite | phlogopite |
|---|---|
| 6.75 | 93.25 |

feldspar  mass = 32.60 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -521675.89 (J)  H = -453091.01 (J)  S = 67.69 (J/K)  V = 12.52 (cc)  Cp = 40.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.65 | 14.86 | 9.49 |

feldspar  mass = 10.13 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -157026.28 (J)  H = -136160.39 (J)  S = 20.60 (J/K)  V = 3.98 (cc)  Cp = 12.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.50 | 1.14 | 68.37 |

quartz  mass = 28.09 (gm)  density = 2.59 (gm/cc)
SiO2
G = -452501.24 (J)  H = -397659.39 (J)  S = 54.13 (J/K)  V = 10.84 (cc)  Cp = 37.87 (J/K)

rhm-oxide  mass = 0.37 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.06Fe"0.76Mg0.09Fe'"0.12Al0.07Ti0.90O3
G = -3530.80 (J)  H = -2870.36 (J)  S = 0.65 (J/K)  V = 0.08 (cc)  Cp = 0.34 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.63 | 6.16 | 75.84 | 5.80 | 3.57 |

Total solids mass = 92.12 (gm) density = 2.78 (gm/cc)
G = -1421915.38 (J) H = -1236958.32 (J) S = 182.56 (J/K) V = 33.17 (cc) Cp = 113.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.47 (gm) density = 2.73 (gm/cc)
G = -1540818.37 (J) H = -1334261.60 (J) S = 203.88 (J/K) V = 36.42 (cc) Cp = 124.12 (J/K)

Oxygen delta moles = -0.00225266 delta grams = -0.0720826
G = 504.75 (J) H = -52.17 (J) S = -0.55 (J/K) V = -189.76 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 730.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.18 COH = 0.89 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 5.75 (gm) density = 2.21 (gm/cc) viscosity = 1.94 (log 10 poise) (analysis in wt %)
G = -93433.22 (J) H = -75764.14 (J) S = 17.61 (J/K) V = 2.60 (cc) Cp = 8.39 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.25 | 0.06 | 10.41 | 0.27 | 0.00 | 0.68 | 1.58 | 0.08 | 0.00 | 0.00 | 3.05 | 7.02 | 2.46 | 1.74 | 14.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.66 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.63Mg0.19)3Al2Si3O12
G = -191864.76 (J) H = -165125.30 (J) S = 26.66 (J/K) V = 3.68 (cc) Cp = 15.49 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.90 | 18.53 | 18.56 |

clinopyroxene mass = 2.32 (gm) density = 3.60 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.28Fe'"0.04Ti0.42Al0.76Si1.23O6
G = -33176.01 (J) H = -28931.25 (J) S = 4.23 (J/K) V = 0.65 (cc) Cp = 2.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.93 | 1.15 | 29.22 | 73.01 | 10.01 | -6.39 | 8.94 |

biotite mass = 4.07 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -63255.54 (J) H = -54632.27 (J) S = 8.60 (J/K) V = 1.46 (cc) Cp = 5.07 (J/K)

| annite | phlogopite |
|---|---|
| 7.03 | 92.97 |

feldspar mass = 32.84 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -524977.63 (J) H = -456974.26 (J) S = 67.79 (J/K) V = 12.61 (cc) Cp = 41.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.06 | 14.91 | 9.04 |

feldspar mass = 10.73 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -165994.95 (J) H = -144257.49 (J) S = 21.67 (J/K) V = 4.22 (cc) Cp = 12.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.58 | 1.04 | 69.38 |

quartz mass = 28.77 (gm) density = 2.60 (gm/cc)
SiO2
G = -462817.94 (J) H = -407597.34 (J) S = 55.05 (J/K) V = 11.08 (cc) Cp = 38.45 (J/K)

rhm-oxide mass = 0.34 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.77Mg0.08Fe'"0.12Al0.07Ti0.91O3
G = -3254.28 (J) H = -2653.80 (J) S = 0.60 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.27 | 5.84 | 76.79 | 5.52 | 3.58 |

Total solids mass = 93.73 (gm) density = 2.78 (gm/cc)
G = -1445341.12 (J) H = -1260171.72 (J) S = 184.59 (J/K) V = 33.76 (cc) Cp = 115.83 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.47 (gm) density = 2.74 (gm/cc)
G = -1538774.34 (J) H = -1335935.86 (J) S = 202.20 (J/K) V = 36.36 (cc) Cp = 124.22 (J/K)

Oxygen delta moles = -0.00227879 delta grams = -0.0729184
G = 505.05 (J) H = -51.98 (J) S = -0.56 (J/K) V = -190.06 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 3.93 (log 10 poise)  (analysis in wt %)
G = -1683598.22 (J)  H = -1240825.77 (J)  S = 281.46 (J/K)  V = 40.15 (cc)  Cp = 143.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.77 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.93 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1683598.22 (J)  H = -1240825.77 (J)  S = 281.46 (J/K)  V = 40.15 (cc)  Cp = 143.10 (J/K)

Oxygen  delta moles = -2.98372e-16  delta grams = -9.54756e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 3.98 (log 10 poise)  (analysis in wt %)
G = -1680789.42 (J)  H = -1242257.69 (J)  S = 280.54 (J/K)  V = 40.12 (cc)  Cp = 143.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.77 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.98 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1680789.42 (J)  H = -1242257.69 (J)  S = 280.54 (J/K)  V = 40.12 (cc)  Cp = 143.09 (J/K)

Oxygen  delta moles = 2.21917e-06  delta grams = 7.10107e-05
G = -0.81 (J)  H = 0.10 (J)  S = 0.00 (J/K)  V = 0.29 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 4.04 (log 10 poise)  (analysis in wt %)
G = -1677989.94 (J)  H = -1243689.68 (J)  S = 279.63 (J/K)  V = 40.09 (cc)  Cp = 143.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.77 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.04 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1677989.94 (J)  H = -1243689.68 (J)  S = 279.63 (J/K)  V = 40.09 (cc)  Cp = 143.08 (J/K)

Oxygen  delta moles = 4.75524e-06  delta grams = 0.000152162
G = -1.71 (J)  H = 0.20 (J)  S = 0.00 (J/K)  V = 0.61 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 4.10 (log 10 poise)  (analysis in wt %)
G = -1675199.85 (J)  H = -1245121.72 (J)  S = 278.70 (J/K)  V = 40.06 (cc)  Cp = 143.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.77 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.10 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1675199.85 (J)  H = -1245121.72 (J)  S = 278.70 (J/K)  V = 40.06 (cc)  Cp = 143.07 (J/K)

Oxygen  delta moles = 7.61705e-06  delta grams = 0.000243736
G = -2.72 (J)  H = 0.32 (J)  S = 0.00 (J/K)  V = 0.98 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 4.16 (log 10 poise)  (analysis in wt %)
G = -1672419.20 (J)  H = -1246553.83 (J)  S = 277.77 (J/K)  V = 40.03 (cc)  Cp = 143.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.77 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.16 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1672419.20 (J)  H = -1246553.83 (J)  S = 277.77 (J/K)  V = 40.03 (cc)  Cp = 143.06 (J/K)

Oxygen  delta moles = 1.08138e-05  delta grams = 0.000346027
G = -3.84 (J)  H = 0.45 (J)  S = 0.00 (J/K)  V = 1.38 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 4.22 (log 10 poise)  (analysis in wt %)
G = -1669648.07 (J)  H = -1247986.01 (J)  S = 276.84 (J/K)  V = 40.00 (cc)  Cp = 143.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.78 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.22 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1669648.07 (J)  H = -1247986.01 (J)  S = 276.84 (J/K)  V = 40.00 (cc)  Cp = 143.05 (J/K)

Oxygen  delta moles = 1.4355e-05  delta grams = 0.000459342
G = -5.06 (J)  H = 0.59 (J)  S = 0.00 (J/K)  V = 1.82 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1240.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.17  COH = 2.08  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 4.28 (log 10 poise) (analysis in wt %)
G = -1666886.52 (J) H = -1249418.28 (J) S = 275.89 (J/K) V = 39.97 (cc) Cp = 143.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.78 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.28 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1666886.52 (J) H = -1249418.28 (J) S = 275.89 (J/K) V = 39.97 (cc) Cp = 143.04 (J/K)

Oxygen delta moles = 1.82507e-05 delta grams = 0.000584
G = -6.39 (J) H = 0.75 (J) S = 0.00 (J/K) V = 2.30 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1230.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.16 COH = 2.06 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 4.34 (log 10 poise) (analysis in wt %)
G = -1664134.61 (J) H = -1250850.63 (J) S = 274.95 (J/K) V = 39.94 (cc) Cp = 143.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.78 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.34 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1664134.61 (J) H = -1250850.63 (J) S = 274.95 (J/K) V = 39.94 (cc) Cp = 143.03 (J/K)

Oxygen delta moles = 2.25113e-05 delta grams = 0.000720335
G = -7.82 (J) H = 0.92 (J) S = 0.01 (J/K) V = 2.81 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.51 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -1661392.42 (J) H = -1252283.09 (J) S = 273.99 (J/K) V = 39.91 (cc) Cp = 143.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.78 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.40 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1661392.42 (J) H = -1252283.09 (J) S = 273.99 (J/K) V = 39.91 (cc) Cp = 143.02 (J/K)

Oxygen delta moles = 2.71477e-05 delta grams = 0.000868695
G = -9.36 (J) H = 1.09 (J) S = 0.01 (J/K) V = 3.37 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.51 (gm/cc) viscosity = 4.46 (log 10 poise) (analysis in wt %)
G = -1658660.00 (J) H = -1253715.64 (J) S = 273.03 (J/K) V = 39.88 (cc) Cp = 143.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.50 | 13.96 | 0.78 | 0.00 | 4.12 | 0.10 | 1.91 | 0.00 | 0.00 | 2.71 | 3.72 | 2.41 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.46 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1658660.00 (J) H = -1253715.64 (J) S = 273.03 (J/K) V = 39.88 (cc) Cp = 143.02 (J/K)

Oxygen delta moles = 3.21713e-05 delta grams = 0.00102944
G = -11.01 (J) H = 1.29 (J) S = 0.01 (J/K) V = 3.97 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 99.71 (gm) density = 2.51 (gm/cc) viscosity = 4.54 (log 10 poise) (analysis in wt %)
G = -1651440.66 (J) H = -1251753.13 (J) S = 271.31 (J/K) V = 39.75 (cc) Cp = 135.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.73 | 0.50 | 14.00 | 0.78 | 0.00 | 4.08 | 0.10 | 1.84 | 0.00 | 0.00 | 2.72 | 3.73 | 2.42 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.29 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.50Mg1.41Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -4488.12 (J) H = -3455.99 (J) S = 0.70 (J/K) V = 0.09 (cc) Cp = 0.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.69 | 96.81 | 49.93 | 3.57 | -3.38 | 5.44 | 0.32 |

Total solids mass = 0.29 (gm) density = 3.32 (gm/cc)
G = -4488.12 (J) H = -3455.99 (J) S = 0.70 (J/K) V = 0.09 (cc) Cp = 0.36 (J/K)

Viscosity of the System: 4.54 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1655928.77 (J) H = -1255209.12 (J) S = 272.02 (J/K) V = 39.84 (cc) Cp = 135.46 (J/K)

Oxygen delta moles = 2.17348e-05 delta grams = 0.000695488
G = -7.38 (J) H = 0.86 (J) S = 0.01 (J/K) V = 2.66 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 99.18 (gm) density = 2.51 (gm/cc) viscosity = 4.63 (log 10 poise) (analysis in wt %)
G = -1640694.20 (J) H = -1247119.35 (J) S = 268.99 (J/K) V = 39.54 (cc) Cp = 134.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.81 | 0.51 | 14.06 | 0.77 | 0.00 | 4.02 | 0.10 | 1.71 | 0.00 | 0.00 | 2.73 | 3.75 | 2.43 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.82 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.52Mg1.39Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -12505.89 (J) H = -9646.06 (J) S = 1.95 (J/K) V = 0.25 (cc) Cp = 1.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.46 | 96.66 | 51.71 | 3.67 | -3.47 | 5.56 | 0.33 |

Total solids mass = 0.82 (gm) density = 3.32 (gm/cc)
G = -12505.89 (J) H = -9646.06 (J) S = 1.95 (J/K) V = 0.25 (cc) Cp = 1.01 (J/K)

Viscosity of the System: 4.64 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1653200.09 (J) H = -1256765.41 (J) S = 270.95 (J/K) V = 39.79 (cc) Cp = 135.27 (J/K)

Oxygen delta moles = -3.20089e-06 delta grams = -0.000102425

G = 1.08 (J)  H = -0.13 (J)  S = -0.00 (J/K)  V = -0.39 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1180.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.80  delta HM = -4.86  NNO = 0.00  QFM = 0.13  COH = 1.97  IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.67 (gm)  density = 2.51 (gm/cc)  viscosity = 4.72 (log 10 poise)  (analysis in wt %)
G = -1630243.28 (J)  H = -1242676.69 (J)  S = 266.71 (J/K)  V = 39.34 (cc)  Cp = 133.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.90 | 0.51 | 14.12 | 0.76 | 0.00 | 3.95 | 0.10 | 1.59 | 0.00 | 0.00 | 2.74 | 3.77 | 2.44 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.33 (gm)  density = 3.33 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.54Mg1.37Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -20237.88 (J)  H = -15635.84 (J)  S = 3.17 (J/K)  V = 0.40 (cc)  Cp = 1.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.28 | 96.51 | 53.55 | 3.76 | -3.57 | 5.69 | 0.34 |

Total solids  mass = 1.33 (gm)  density = 3.33 (gm/cc)
G = -20237.88 (J)  H = -15635.84 (J)  S = 3.17 (J/K)  V = 0.40 (cc)  Cp = 1.64 (J/K)

Viscosity of the System: 4.74 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1650481.16 (J)  H = -1258312.53 (J)  S = 269.87 (J/K)  V = 39.74 (cc)  Cp = 135.08 (J/K)

Oxygen  delta moles = -2.98974e-05  delta grams = -0.00095668
G = 10.00 (J)  H = -1.16 (J)  S = -0.01 (J/K)  V = -3.61 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1170.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.91  delta HM = -4.87  NNO = 0.00  QFM = 0.12  COH = 1.95  IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.17 (gm)  density = 2.51 (gm/cc)  viscosity = 4.82 (log 10 poise)  (analysis in wt %)
G = -1620065.56 (J)  H = -1238409.80 (J)  S = 264.46 (J/K)  V = 39.14 (cc)  Cp = 132.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.98 | 0.51 | 14.18 | 0.75 | 0.00 | 3.88 | 0.10 | 1.48 | 0.00 | 0.00 | 2.75 | 3.79 | 2.46 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.83 (gm)  density = 3.34 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.55Mg1.35Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -27706.37 (J)  H = -21441.34 (J)  S = 4.34 (J/K)  V = 0.55 (cc)  Cp = 2.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.15 | 96.36 | 55.42 | 3.86 | -3.67 | 5.82 | 0.36 |

Total solids mass = 1.83 (gm) density = 3.34 (gm/cc)
G = -27706.37 (J) H = -21441.34 (J) S = 4.34 (J/K) V = 0.55 (cc) Cp = 2.25 (J/K)

Viscosity of the System: 4.84 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1647771.93 (J) H = -1259851.14 (J) S = 268.80 (J/K) V = 39.69 (cc) Cp = 134.90 (J/K)

Oxygen delta moles = -5.84636e-05 delta grams = -0.00187076
G = 19.40 (J) H = -2.25 (J) S = -0.02 (J/K) V = -7.01 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1160.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.12 COH = 1.93 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 97.67 (gm) density = 2.51 (gm/cc) viscosity = 4.91 (log 10 poise) (analysis in wt %)
G = -1610140.67 (J) H = -1234304.58 (J) S = 262.24 (J/K) V = 38.94 (cc) Cp = 131.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.06 | 0.51 | 14.24 | 0.74 | 0.00 | 3.80 | 0.10 | 1.38 | 0.00 | 0.00 | 2.76 | 3.80 | 2.47 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.32 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.32Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -34931.71 (J) H = -27077.27 (J) S = 5.48 (J/K) V = 0.69 (cc) Cp = 2.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.07 | 96.20 | 57.34 | 3.97 | -3.77 | 5.96 | 0.37 |

Total solids mass = 2.32 (gm) density = 3.35 (gm/cc)
G = -34931.71 (J) H = -27077.27 (J) S = 5.48 (J/K) V = 0.69 (cc) Cp = 2.84 (J/K)

Viscosity of the System: 4.94 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1645072.38 (J) H = -1261381.84 (J) S = 267.73 (J/K) V = 39.64 (cc) Cp = 134.71 (J/K)

Oxygen delta moles = -8.90002e-05 delta grams = -0.0028479
G = 29.31 (J) H = -3.40 (J) S = -0.02 (J/K) V = -10.60 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1150.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.11 COH = 1.91 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 97.19 (gm) density = 2.51 (gm/cc) viscosity = 5.01 (log 10 poise) (analysis in wt %)
G = -1600450.26 (J) H = -1230348.24 (J) S = 260.06 (J/K) V = 38.75 (cc) Cp = 131.12 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.15 0.52 14.30 0.73 0.00 3.72 0.10 1.28 0.00 0.00 2.76 3.82 2.48 0.10 1.03 0.00 0.00 0.00 0.00

orthopyroxene mass = 2.81 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.59Mg1.30Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -41932.24 (J) H = -32556.93 (J) S = 6.59 (J/K) V = 0.83 (cc) Cp = 3.42 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-62.02 96.04 59.29 4.08 -3.89 6.11 0.38

Total solids mass = 2.81 (gm) density = 3.36 (gm/cc)
G = -41932.24 (J) H = -32556.93 (J) S = 6.59 (J/K) V = 0.83 (cc) Cp = 3.42 (J/K)

Viscosity of the System: 5.04 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1642382.50 (J) H = -1262905.18 (J) S = 266.65 (J/K) V = 39.59 (cc) Cp = 134.54 (J/K)

Oxygen delta moles = -0.000121597 delta grams = -0.00389096
G = 39.73 (J) H = -4.59 (J) S = -0.03 (J/K) V = -14.39 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1140.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.89 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 96.71 (gm) density = 2.51 (gm/cc) viscosity = 5.10 (log 10 poise) (analysis in wt %)
G = -1590977.98 (J) H = -1226529.34 (J) S = 257.90 (J/K) V = 38.57 (cc) Cp = 130.38 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.24 0.52 14.35 0.72 0.00 3.64 0.10 1.18 0.00 0.00 2.77 3.84 2.49 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.28 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.61Mg1.28Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -48724.29 (J) H = -37892.26 (J) S = 7.67 (J/K) V = 0.97 (cc) Cp = 3.98 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-64.00 95.88 61.27 4.20 -4.01 6.26 0.40

Total solids mass = 3.28 (gm) density = 3.37 (gm/cc)
G = -48724.29 (J) H = -37892.26 (J) S = 7.67 (J/K) V = 0.97 (cc) Cp = 3.98 (J/K)

Viscosity of the System: 5.15 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1639702.27 (J) H = -1264421.61 (J) S = 265.56 (J/K) V = 39.54 (cc) Cp = 134.36 (J/K)

Oxygen delta moles = -0.00015633 delta grams = -0.00500238
G = 50.68 (J) H = -5.85 (J) S = -0.04 (J/K) V = -18.37 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1130.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.87  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.24 (gm)  density = 2.51 (gm/cc)  viscosity = 5.20 (log 10 poise)  (analysis in wt %)
G = -1581709.63 (J)  H = -1222837.82 (J)  S = 255.76 (J/K)  V = 38.38 (cc)  Cp = 129.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.33 | 0.52 | 14.41 | 0.70 | 0.00 | 3.55 | 0.10 | 1.10 | 0.00 | 0.00 | 2.78 | 3.86 | 2.50 | 0.10 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.75 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.63Mg1.26Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -55322.09 (J)  H = -43093.72 (J)  S = 8.71 (J/K)  V = 1.11 (cc)  Cp = 4.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.02 | 95.72 | 63.27 | 4.33 | -4.13 | 6.42 | 0.41 |

Total solids  mass = 3.75 (gm)  density = 3.38 (gm/cc)
G = -55322.09 (J)  H = -43093.72 (J)  S = 8.71 (J/K)  V = 1.11 (cc)  Cp = 4.53 (J/K)

Viscosity of the System: 5.25 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.53 (gm/cc)
G = -1637031.72 (J)  H = -1265931.53 (J)  S = 264.48 (J/K)  V = 39.49 (cc)  Cp = 134.19 (J/K)

Oxygen  delta moles = -0.000193259  delta grams = -0.00618407
G = 62.15 (J)  H = -7.16 (J)  S = -0.05 (J/K)  V = -22.55 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1120.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.53  delta HM = -4.90  NNO = 0.00  QFM = 0.09  COH = 1.85  IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.78 (gm)  density = 2.51 (gm/cc)  viscosity = 5.30 (log 10 poise)  (analysis in wt %)
G = -1572633.08 (J)  H = -1219265.01 (J)  S = 253.65 (J/K)  V = 38.20 (cc)  Cp = 128.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.42 | 0.52 | 14.46 | 0.69 | 0.00 | 3.45 | 0.10 | 1.01 | 0.00 | 0.00 | 2.79 | 3.88 | 2.52 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.21 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.65Mg1.23Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -61737.77 (J)  H = -48170.28 (J)  S = 9.74 (J/K)  V = 1.24 (cc)  Cp = 5.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.05 | 95.56 | 65.28 | 4.46 | -4.26 | 6.59 | 0.43 |

Total solids  mass = 4.21 (gm)  density = 3.39 (gm/cc)

G = -61737.77 (J)  H = -48170.28 (J)  S = 9.74 (J/K)  V = 1.24 (cc)  Cp = 5.07 (J/K)

Viscosity of the System: 5.36 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.54 (gm/cc)
G = -1634370.85 (J)  H = -1267435.28 (J)  S = 263.39 (J/K)  V = 39.44 (cc)  Cp = 134.02 (J/K)

Oxygen  delta moles = -0.000232424  delta grams = -0.00743729
G = 74.15 (J)  H = -8.53 (J)  S = -0.06 (J/K)  V = -26.92 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1110.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.08  COH = 1.83  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.32 (gm)  density = 2.51 (gm/cc)  viscosity = 5.40 (log 10 poise)  (analysis in wt %)
G = -1563738.40 (J)  H = -1215803.72 (J)  S = 251.55 (J/K)  V = 38.02 (cc)  Cp = 128.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.52 | 0.53 | 14.52 | 0.68 | 0.00 | 3.35 | 0.11 | 0.94 | 0.00 | 0.00 | 2.79 | 3.90 | 2.53 | 0.11 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.67 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.67Mg1.21Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -67981.31 (J)  H = -53129.38 (J)  S = 10.74 (J/K)  V = 1.37 (cc)  Cp = 5.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.10 | 95.40 | 67.30 | 4.60 | -4.40 | 6.76 | 0.44 |

Total solids  mass = 4.67 (gm)  density = 3.40 (gm/cc)
G = -67981.31 (J)  H = -53129.38 (J)  S = 10.74 (J/K)  V = 1.37 (cc)  Cp = 5.60 (J/K)

Viscosity of the System: 5.46 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.54 (gm/cc)
G = -1631719.71 (J)  H = -1268933.11 (J)  S = 262.29 (J/K)  V = 39.40 (cc)  Cp = 133.85 (J/K)

Oxygen  delta moles = -0.000273843  delta grams = -0.00876264
G = 86.67 (J)  H = -9.95 (J)  S = -0.07 (J/K)  V = -31.49 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1100.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.07  COH = 1.81  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.87 (gm)  density = 2.51 (gm/cc)  viscosity = 5.50 (log 10 poise)  (analysis in wt %)
G = -1555017.79 (J)  H = -1212448.24 (J)  S = 249.48 (J/K)  V = 37.85 (cc)  Cp = 127.56 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

69.61 0.53 14.57 0.66 0.00 3.24 0.11 0.86 0.00 0.00 2.80 3.91 2.54 0.11 1.06 0.00 0.00 0.00 0.00

orthopyroxene mass = 5.12 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.69Mg1.18Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -74060.56 (J) H = -57976.95 (J) S = 11.71 (J/K) V = 1.50 (cc) Cp = 6.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.15 | 95.24 | 69.31 | 4.75 | -4.55 | 6.94 | 0.46 |

Total solids mass = 5.12 (gm) density = 3.41 (gm/cc)
G = -74060.56 (J) H = -57976.95 (J) S = 11.71 (J/K) V = 1.50 (cc) Cp = 6.12 (J/K)

Viscosity of the System: 5.57 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1629078.35 (J) H = -1270425.19 (J) S = 261.19 (J/K) V = 39.35 (cc) Cp = 133.68 (J/K)

Oxygen delta moles = -0.000317508 delta grams = -0.0101599
G = 99.68 (J) H = -11.42 (J) S = -0.08 (J/K) V = -36.25 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 94.43 (gm) density = 2.51 (gm/cc) viscosity = 5.61 (log 10 poise) (analysis in wt %)
G = -1546465.59 (J) H = -1209194.29 (J) S = 247.42 (J/K) V = 37.68 (cc) Cp = 126.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.71 | 0.53 | 14.62 | 0.64 | 0.00 | 3.14 | 0.11 | 0.80 | 0.00 | 0.00 | 2.81 | 3.93 | 2.55 | 0.11 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.56 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.71Mg1.16Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -79981.25 (J) H = -62717.35 (J) S = 12.66 (J/K) V = 1.63 (cc) Cp = 6.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.20 | 95.09 | 71.31 | 4.91 | -4.71 | 7.13 | 0.47 |

Total solids mass = 5.56 (gm) density = 3.42 (gm/cc)
G = -79981.25 (J) H = -62717.35 (J) S = 12.66 (J/K) V = 1.63 (cc) Cp = 6.63 (J/K)

Viscosity of the System: 5.68 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1626446.84 (J) H = -1271911.64 (J) S = 260.09 (J/K) V = 39.30 (cc) Cp = 133.51 (J/K)

Oxygen delta moles = -0.000363387 delta grams = -0.0116279
G = 113.16 (J) H = -12.94 (J) S = -0.09 (J/K) V = -41.18 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1080.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.06  COH = 1.76  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.99 (gm)  density = 2.51 (gm/cc)  viscosity = 5.71 (log 10 poise)  (analysis in wt %)
G = -1538078.21 (J)  H = -1206039.07 (J)  S = 245.38 (J/K)  V = 37.51 (cc)  Cp = 126.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.81 | 0.53 | 14.67 | 0.62 | 0.00 | 3.02 | 0.11 | 0.73 | 0.00 | 0.00 | 2.81 | 3.95 | 2.57 | 0.11 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.00 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.73Mg1.14Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -85747.05 (J)  H = -67353.45 (J)  S = 13.59 (J/K)  V = 1.75 (cc)  Cp = 7.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.24 | 94.93 | 73.29 | 5.07 | -4.87 | 7.32 | 0.49 |

Total solids  mass = 6.00 (gm)  density = 3.43 (gm/cc)
G = -85747.05 (J)  H = -67353.45 (J)  S = 13.59 (J/K)  V = 1.75 (cc)  Cp = 7.13 (J/K)

Viscosity of the System: 5.79 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.55 (gm/cc)
G = -1623825.27 (J)  H = -1273392.51 (J)  S = 258.98 (J/K)  V = 39.26 (cc)  Cp = 133.35 (J/K)

Oxygen  delta moles = -0.000411415  delta grams = -0.0131648
G = 127.07 (J)  H = -14.50 (J)  S = -0.10 (J/K)  V = -46.29 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1070.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.05  COH = 1.74  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 91.63 (gm)  density = 2.50 (gm/cc)  viscosity = 5.82 (log 10 poise)  (analysis in wt %)
G = -1498105.73 (J)  H = -1177912.34 (J)  S = 238.39 (J/K)  V = 36.60 (cc)  Cp = 122.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.11 | 0.55 | 14.55 | 0.61 | 0.00 | 2.93 | 0.11 | 0.67 | 0.00 | 0.00 | 2.76 | 3.90 | 2.62 | 0.11 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.56 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.76Mg1.11Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -93000.16 (J)  H = -73153.58 (J)  S = 14.78 (J/K)  V = 1.90 (cc)  Cp = 7.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.01 | 94.95 | 75.95 | 5.13 | -4.93 | 7.41 | 0.49 |

feldspar  mass = 1.79 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.03Na0.68Ca0.29Al1.29Si2.71O8
G = -30095.36 (J)  H = -24299.31 (J)  S = 4.32 (J/K)  V = 0.69 (cc)  Cp = 2.20 (J/K)

albite anorthite sanidine
67.59 28.92 3.48

Total solids mass = 8.35 (gm) density = 3.22 (gm/cc)
G = -123095.52 (J) H = -97452.90 (J) S = 19.09 (J/K) V = 2.59 (cc) Cp = 9.96 (J/K)

Viscosity of the System: 5.94 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1621201.25 (J) H = -1275365.24 (J) S = 257.48 (J/K) V = 39.19 (cc) Cp = 132.83 (J/K)

Oxygen delta moles = -0.000486536 delta grams = -0.0155686
G = 149.03 (J) H = -16.97 (J) S = -0.12 (J/K) V = -54.33 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1060.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.04 COH = 1.72 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 88.09 (gm) density = 2.50 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -1438860.32 (J) H = -1134374.61 (J) S = 228.40 (J/K) V = 35.24 (cc) Cp = 117.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.56 | 0.57 | 14.30 | 0.59 | 0.00 | 2.84 | 0.11 | 0.60 | 0.00 | 0.00 | 2.67 | 3.79 | 2.70 | 0.11 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.18 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.79Mg1.08Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -100891.15 (J) H = -79459.24 (J) S = 16.08 (J/K) V = 2.08 (cc) Cp = 8.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.23 | 95.09 | 79.03 | 5.12 | -4.91 | 7.43 | 0.48 |

feldspar mass = 4.71 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -78832.36 (J) H = -63791.40 (J) S = 11.28 (J/K) V = 1.80 (cc) Cp = 5.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.16 | 28.19 | 3.65 |

Total solids mass = 11.89 (gm) density = 3.06 (gm/cc)
G = -179723.51 (J) H = -143250.64 (J) S = 27.36 (J/K) V = 3.88 (cc) Cp = 14.21 (J/K)

Viscosity of the System: 6.12 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1618583.83 (J) H = -1277625.25 (J) S = 255.75 (J/K) V = 39.12 (cc) Cp = 132.10 (J/K)

Oxygen delta moles = -0.000580807 delta grams = -0.0185851
G = 176.43 (J) H = -20.05 (J) S = -0.15 (J/K) V = -64.38 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1050.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.04  COH = 1.70  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 82.47 (gm)  density = 2.50 (gm/cc)  viscosity = 5.97 (log 10 poise)  (analysis in wt %)
G = -1345235.79 (J)  H = -1062901.85 (J)  S = 213.38 (J/K)  V = 33.03 (cc)  Cp = 110.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.64 | 0.61 | 14.21 | 0.58 | 0.00 | 2.78 | 0.12 | 0.55 | 0.00 | 0.00 | 2.61 | 3.71 | 2.85 | 0.12 | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 7.85 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.05Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -109320.67 (J)  H = -86204.77 (J)  S = 17.47 (J/K)  V = 2.26 (cc)  Cp = 9.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.53 | 95.20 | 82.09 | 5.17 | -4.96 | 7.54 | 0.48 |

feldspar  mass = 8.26 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -138049.56 (J)  H = -111960.89 (J)  S = 19.72 (J/K)  V = 3.16 (cc)  Cp = 10.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.38 | 27.72 | 3.91 |

quartz  mass = 1.40 (gm)  density = 2.56 (gm/cc)
SiO2
G = -23375.45 (J)  H = -19189.27 (J)  S = 3.16 (J/K)  V = 0.55 (cc)  Cp = 1.67 (J/K)

Total solids  mass = 17.50 (gm)  density = 2.93 (gm/cc)
G = -270745.67 (J)  H = -217354.94 (J)  S = 40.35 (J/K)  V = 5.97 (cc)  Cp = 20.95 (J/K)

Viscosity of the System: 6.28 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.56 (gm/cc)
G = -1615981.46 (J)  H = -1280256.79 (J)  S = 253.73 (J/K)  V = 39.00 (cc)  Cp = 131.21 (J/K)

Oxygen  delta moles = -0.000681184  delta grams = -0.0217971
G = 205.20 (J)  H = -23.27 (J)  S = -0.17 (J/K)  V = -74.94 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1040.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.03  COH = 1.67  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 76.59 (gm)  density = 2.49 (gm/cc)  viscosity = 5.98 (log 10 poise)  (analysis in wt %)
G = -1247541.55 (J)  H = -987714.45 (J)  S = 197.87 (J/K)  V = 30.71 (cc)  Cp = 102.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.58 | 0.65 | 14.18 | 0.58 | 0.00 | 2.72 | 0.13 | 0.50 | 0.00 | 0.00 | 2.55 | 3.63 | 3.03 | 0.13 | 1.31 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.49 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.85Mg1.02Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -117306.67 (J) H = -92625.22 (J) S = 18.80 (J/K) V = 2.44 (cc) Cp = 9.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.67 | 95.30 | 84.98 | 5.24 | -5.02 | 7.68 | 0.47 |

feldspar mass = 11.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.27Al1.27Si2.73O8
G = -195840.01 (J) H = -159188.77 (J) S = 27.91 (J/K) V = 4.49 (cc) Cp = 14.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.44 | 27.36 | 4.20 |

quartz mass = 3.16 (gm) density = 2.56 (gm/cc)
SiO2
G = -52712.23 (J) H = -43368.43 (J) S = 7.12 (J/K) V = 1.23 (cc) Cp = 3.76 (J/K)

Total solids mass = 23.38 (gm) density = 2.86 (gm/cc)
G = -365858.91 (J) H = -295182.42 (J) S = 53.82 (J/K) V = 8.16 (cc) Cp = 28.11 (J/K)

Viscosity of the System: 6.46 (log 10 poise)

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1613400.46 (J) H = -1282896.88 (J) S = 251.69 (J/K) V = 38.87 (cc) Cp = 130.45 (J/K)

Oxygen delta moles = -0.000780776 delta grams = -0.0249839
G = 233.22 (J) H = -26.39 (J) S = -0.20 (J/K) V = -85.24 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1030.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.02 COH = 1.65 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 71.36 (gm) density = 2.49 (gm/cc) viscosity = 6.00 (log 10 poise) (analysis in wt %)
G = -1160943.72 (J) H = -921046.94 (J) S = 184.09 (J/K) V = 28.65 (cc) Cp = 95.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.53 | 0.70 | 14.15 | 0.57 | 0.00 | 2.65 | 0.14 | 0.46 | 0.00 | 0.00 | 2.49 | 3.55 | 3.21 | 0.14 | 1.41 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.08 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.88Mg0.99Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -124428.65 (J) H = -98392.76 (J) S = 19.98 (J/K) V = 2.60 (cc) Cp = 10.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.53 | 95.40 | 87.63 | 5.31 | -5.07 | 7.80 | 0.47 |

feldspar mass = 14.82 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.27Al1.27Si2.73O8
G = -246966.03 (J) H = -201200.51 (J) S = 35.12 (J/K) V = 5.68 (cc) Cp = 18.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.48 | 27.03 | 4.49 |

quartz mass = 4.71 (gm) density = 2.56 (gm/cc)
SiO2
G = -78503.17 (J) H = -64730.80 (J) S = 10.57 (J/K) V = 1.84 (cc) Cp = 5.60 (J/K)

Total solids mass = 28.61 (gm) density = 2.83 (gm/cc)
G = -449897.84 (J) H = -364324.08 (J) S = 65.67 (J/K) V = 10.11 (cc) Cp = 34.38 (J/K)

Viscosity of the System: 6.64 (log 10 poise)

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1610841.56 (J) H = -1285371.02 (J) S = 249.76 (J/K) V = 38.76 (cc) Cp = 129.69 (J/K)

Oxygen delta moles = -0.000876347 delta grams = -0.0280421
G = 259.55 (J) H = -29.31 (J) S = -0.22 (J/K) V = -94.95 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1020.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.01 COH = 1.63 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 66.69 (gm) density = 2.49 (gm/cc) viscosity = 6.02 (log 10 poise) (analysis in wt %)
G = -1083752.79 (J) H = -861597.96 (J) S = 171.79 (J/K) V = 26.80 (cc) Cp = 89.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.48 | 0.75 | 14.13 | 0.55 | 0.00 | 2.56 | 0.15 | 0.42 | 0.00 | 0.00 | 2.45 | 3.47 | 3.39 | 0.15 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.61 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg0.97Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -130777.13 (J) H = -103578.07 (J) S = 21.03 (J/K) V = 2.74 (cc) Cp = 11.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.12 | 95.48 | 90.02 | 5.38 | -5.12 | 7.90 | 0.46 |

feldspar mass = 17.58 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -292439.87 (J) H = -238786.19 (J) S = 41.49 (J/K) V = 6.73 (cc) Cp = 21.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.49 | 26.73 | 4.78 |

quartz mass = 6.08 (gm) density = 2.56 (gm/cc)
SiO2
G = -101334.10 (J) H = -83741.12 (J) S = 13.60 (J/K) V = 2.38 (cc) Cp = 7.23 (J/K)

Total solids mass = 33.27 (gm) density = 2.81 (gm/cc)
G = -524551.10 (J) H = -426105.38 (J) S = 76.13 (J/K) V = 11.85 (cc) Cp = 39.95 (J/K)

Viscosity of the System: 6.84 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1608303.89 (J) H = -1287703.34 (J) S = 247.92 (J/K) V = 38.65 (cc) Cp = 129.00 (J/K)

Oxygen delta moles = -0.000967595 delta grams = -0.0309619
G = 284.13 (J) H = -32.01 (J) S = -0.24 (J/K) V = -104.03 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1010.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.00 COH = 1.60 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 62.50 (gm) density = 2.48 (gm/cc) viscosity = 6.03 (log 10 poise) (analysis in wt %)
G = -1014604.51 (J) H = -808317.32 (J) S = 160.77 (J/K) V = 25.15 (cc) Cp = 83.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.42 | 0.80 | 14.11 | 0.54 | 0.00 | 2.46 | 0.16 | 0.39 | 0.00 | 0.00 | 2.40 | 3.39 | 3.57 | 0.16 | 1.61 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.10 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.92Mg0.95Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -136427.46 (J) H = -108239.30 (J) S = 21.97 (J/K) V = 2.87 (cc) Cp = 11.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.45 | 95.57 | 92.18 | 5.43 | -5.16 | 7.98 | 0.45 |

feldspar mass = 20.05 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.26Al1.26Si2.74O8
G = -333080.79 (J) H = -272585.47 (J) S = 47.15 (J/K) V = 7.68 (cc) Cp = 24.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.47 | 26.45 | 5.08 |

quartz mass = 7.32 (gm) density = 2.56 (gm/cc)
SiO2
G = -121673.90 (J) H = -100771.49 (J) S = 16.29 (J/K) V = 2.86 (cc) Cp = 8.69 (J/K)

Total solids mass = 37.46 (gm) density = 2.79 (gm/cc)
G = -591182.16 (J) H = -481596.25 (J) S = 85.40 (J/K) V = 13.41 (cc) Cp = 44.94 (J/K)

Viscosity of the System: 7.06 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1605786.67 (J) H = -1289913.58 (J) S = 246.17 (J/K) V = 38.56 (cc) Cp = 128.37 (J/K)

Oxygen delta moles = -0.00105431 delta grams = -0.0337365
G = 306.93 (J) H = -34.50 (J) S = -0.27 (J/K) V = -112.48 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 1000.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = -0.00 COH = 1.58 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 58.73 (gm) density = 2.48 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -952378.75 (J) H = -760343.31 (J) S = 150.83 (J/K) V = 23.66 (cc) Cp = 78.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.36 | 0.85 | 14.09 | 0.52 | 0.00 | 2.35 | 0.17 | 0.36 | 0.00 | 0.00 | 2.36 | 3.31 | 3.75 | 0.17 | 1.71 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.53 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.94Mg0.93Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -141445.64 (J) H = -112426.82 (J) S = 22.79 (J/K) V = 2.99 (cc) Cp = 12.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.53 | 95.64 | 94.11 | 5.49 | -5.20 | 8.04 | 0.45 |

feldspar mass = 22.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.26Al1.26Si2.74O8
G = -369562.41 (J) H = -303124.40 (J) S = 52.18 (J/K) V = 8.53 (cc) Cp = 27.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.43 | 26.19 | 5.37 |

quartz mass = 8.42 (gm) density = 2.56 (gm/cc)
SiO2
G = -139902.37 (J) H = -116123.51 (J) S = 18.68 (J/K) V = 3.29 (cc) Cp = 10.00 (J/K)

Total solids mass = 41.24 (gm) density = 2.78 (gm/cc)
G = -650910.41 (J) H = -531674.73 (J) S = 93.65 (J/K) V = 14.81 (cc) Cp = 49.43 (J/K)

Viscosity of the System: 7.32 (log 10 poise)

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1603289.17 (J) H = -1292018.04 (J) S = 244.49 (J/K) V = 38.47 (cc) Cp = 127.80 (J/K)

Oxygen delta moles = -0.00113636 delta grams = -0.0363623
G = 327.95 (J) H = -36.78 (J) S = -0.29 (J/K) V = -120.29 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 55.31 (gm) density = 2.48 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -896143.81 (J) H = -716959.57 (J) S = 141.86 (J/K) V = 22.32 (cc) Cp = 73.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.30 | 0.90 | 14.08 | 0.50 | 0.00 | 2.24 | 0.18 | 0.33 | 0.00 | 0.00 | 2.33 | 3.22 | 3.92 | 0.18 | 1.82 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.93 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.96Mg0.91Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -145891.52 (J) H = -116185.85 (J) S = 23.52 (J/K) V = 3.09 (cc) Cp = 12.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.37 | 95.71 | 95.84 | 5.53 | -5.23 | 8.07 | 0.44 |

feldspar mass = 24.30 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -402445.27 (J) H = -330840.94 (J) S = 56.69 (J/K) V = 9.31 (cc) Cp = 29.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.38 | 25.95 | 5.67 |

quartz mass = 9.42 (gm) density = 2.56 (gm/cc)
SiO2
G = -156330.15 (J) H = -130044.02 (J) S = 20.81 (J/K) V = 3.68 (cc) Cp = 11.18 (J/K)

Total solids mass = 44.65 (gm) density = 2.78 (gm/cc)
G = -704666.94 (J) H = -577070.81 (J) S = 101.01 (J/K) V = 16.08 (cc) Cp = 53.47 (J/K)

Viscosity of the System: 7.64 (log 10 poise)

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1600810.74 (J) H = -1294030.38 (J) S = 242.87 (J/K) V = 38.39 (cc) Cp = 127.27 (J/K)

Oxygen delta moles = -0.00121375 delta grams = -0.0388385
G = 347.23 (J) H = -38.85 (J) S = -0.31 (J/K) V = -127.47 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2p1a1

T = 980.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = -0.02 COH = 1.53 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 52.20 (gm) density = 2.48 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -845116.69 (J) H = -677564.44 (J) S = 133.70 (J/K) V = 21.09 (cc) Cp = 69.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.24 | 0.95 | 14.07 | 0.48 | 0.00 | 2.12 | 0.19 | 0.30 | 0.00 | 0.00 | 2.29 | 3.14 | 4.09 | 0.19 | 1.92 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.28 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.90Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -149820.47 (J) H = -119557.84 (J) S = 24.15 (J/K) V = 3.18 (cc) Cp = 12.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.00 | 95.77 | 97.39 | 5.57 | -5.25 | 8.09 | 0.43 |

feldspar mass = 26.14 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -432200.25 (J) H = -356103.22 (J) S = 60.72 (J/K) V = 10.01 (cc) Cp = 31.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.30 | 25.73 | 5.96 |

quartz mass = 10.34 (gm) density = 2.56 (gm/cc)
SiO2
G = -171213.37 (J) H = -142736.69 (J) S = 22.72 (J/K) V = 4.04 (cc) Cp = 12.25 (J/K)

Total solids mass = 47.75 (gm) density = 2.77 (gm/cc)

G = -753234.09 (J)  H = -618397.74 (J)  S = 107.60 (J/K)  V = 17.23 (cc)  Cp = 57.13 (J/K)

Viscosity of the System: 8.07 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.61 (gm/cc)
G = -1598350.78 (J)  H = -1295962.18 (J)  S = 241.30 (J/K)  V = 38.32 (cc)  Cp = 126.78 (J/K)

Oxygen  delta moles = -0.00128652  delta grams = -0.0411672
G = 364.81 (J)  H = -40.72 (J)  S = -0.32 (J/K)  V = -134.04 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 970.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = -0.03  COH = 1.50
IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 49.37 (gm)  density = 2.47 (gm/cc)  viscosity = 6.08 (log 10 poise)  (analysis in wt %)
G = -798634.20 (J)  H = -641648.55 (J)  S = 126.28 (J/K)  V = 19.97 (cc)  Cp = 65.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.16 | 1.00 | 14.07 | 0.46 | 0.00 | 2.01 | 0.20 | 0.28 | 0.00 | 0.00 | 2.26 | 3.06 | 4.26 | 0.20 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.60 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.88Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -153283.94 (J)  H = -122581.08 (J)  S = 24.70 (J/K)  V = 3.27 (cc)  Cp = 13.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.44 | 95.82 | 98.76 | 5.60 | -5.27 | 8.09 | 0.43 |

feldspar  mass = 27.82 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -459225.89 (J)  H = -379223.02 (J)  S = 64.35 (J/K)  V = 10.65 (cc)  Cp = 33.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.21 | 25.53 | 6.26 |

quartz  mass = 11.17 (gm)  density = 2.56 (gm/cc)
SiO2
G = -184764.67 (J)  H = -154370.68 (J)  S = 24.45 (J/K)  V = 4.36 (cc)  Cp = 13.23 (J/K)

Total solids  mass = 50.58 (gm)  density = 2.77 (gm/cc)
G = -797274.51 (J)  H = -656174.79 (J)  S = 113.50 (J/K)  V = 18.28 (cc)  Cp = 60.45 (J/K)

Viscosity of the System: 8.79 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.61 (gm/cc)
G = -1595908.71 (J)  H = -1297823.33 (J)  S = 239.78 (J/K)  V = 38.25 (cc)  Cp = 126.32 (J/K)

Oxygen  delta moles = -0.00135481  delta grams = -0.0433522
G = 380.77 (J)  H = -42.39 (J)  S = -0.34 (J/K)  V = -140.03 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 960.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = -0.04  COH = 1.47 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 46.79 (gm)  density = 2.47 (gm/cc)  viscosity = 6.09 (log 10 poise)  (analysis in wt %)
G = -756131.12 (J)  H = -608777.88 (J)  S = 119.49 (J/K)  V = 18.95 (cc)  Cp = 62.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.08 | 1.06 | 14.06 | 0.44 | 0.00 | 1.89 | 0.21 | 0.26 | 0.00 | 0.00 | 2.24 | 2.98 | 4.43 | 0.21 | 2.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.88 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.87Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -156329.69 (J)  H = -125291.01 (J)  S = 25.17 (J/K)  V = 3.34 (cc)  Cp = 13.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.72 | 95.88 | 99.98 | 5.64 | -5.28 | 8.08 | 0.42 |

feldspar  mass = 29.36 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -483861.51 (J)  H = -400466.03 (J)  S = 67.63 (J/K)  V = 11.24 (cc)  Cp = 35.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.11 | 25.34 | 6.55 |

quartz  mass = 11.93 (gm)  density = 2.56 (gm/cc)
SiO2
G = -197161.68 (J)  H = -165087.42 (J)  S = 26.01 (J/K)  V = 4.66 (cc)  Cp = 14.12 (J/K)

Total solids  mass = 53.17 (gm)  density = 2.76 (gm/cc)
G = -837352.88 (J)  H = -690844.46 (J)  S = 118.81 (J/K)  V = 19.24 (cc)  Cp = 63.48 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.62 (gm/cc)
G = -1593484.00 (J)  H = -1299622.34 (J)  S = 238.30 (J/K)  V = 38.19 (cc)  Cp = 125.89 (J/K)

Oxygen  delta moles = -0.00141878  delta grams = -0.0453991
G = 395.18 (J)  H = -43.89 (J)  S = -0.36 (J/K)  V = -145.46 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 950.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = -0.05  COH = 1.45 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 44.41 (gm)  density = 2.47 (gm/cc)  viscosity = 6.10 (log 10 poise)  (analysis in wt %)
G = -717123.40 (J)  H = -578580.82 (J)  S = 113.27 (J/K)  V = 18.01 (cc)  Cp = 59.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.98 | 1.11 | 14.06 | 0.41 | 0.00 | 1.77 | 0.23 | 0.25 | 0.00 | 0.00 | 2.21 | 2.89 | 4.59 | 0.23 | 2.26 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.13 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.01Mg0.86Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -159001.78 (J) H = -127720.23 (J) S = 25.57 (J/K) V = 3.41 (cc) Cp = 13.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.84 | 95.92 | 101.07 | 5.67 | -5.29 | 8.05 | 0.42 |

feldspar mass = 30.77 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -506397.42 (J) H = -420059.74 (J) S = 70.59 (J/K) V = 11.78 (cc) Cp = 37.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.99 | 25.16 | 6.85 |

quartz mass = 12.64 (gm) density = 2.56 (gm/cc)
SiO2
G = -208553.57 (J) H = -175005.73 (J) S = 27.43 (J/K) V = 4.94 (cc) Cp = 14.94 (J/K)

Total solids mass = 55.54 (gm) density = 2.76 (gm/cc)
G = -873952.77 (J) H = -722785.71 (J) S = 123.59 (J/K) V = 20.12 (cc) Cp = 66.25 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1591076.18 (J) H = -1301366.53 (J) S = 236.86 (J/K) V = 38.13 (cc) Cp = 125.49 (J/K)

Oxygen delta moles = -0.00147863 delta grams = -0.0473143
G = 408.15 (J) H = -45.21 (J) S = -0.37 (J/K) V = -150.37 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 940.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = -0.06 COH = 1.42 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 41.85 (gm) density = 2.46 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -675601.54 (J) H = -546228.68 (J) S = 106.64 (J/K) V = 17.01 (cc) Cp = 55.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.01 | 1.00 | 14.08 | 0.39 | 0.00 | 1.64 | 0.23 | 0.23 | 0.00 | 0.00 | 2.18 | 2.82 | 4.78 | 0.24 | 2.40 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.25 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.02Mg0.86Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -160121.87 (J) H = -128945.43 (J) S = 25.70 (J/K) V = 3.44 (cc) Cp = 13.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.24 | 95.93 | 101.58 | 5.63 | -5.29 | 7.97 | 0.41 |

feldspar mass = 32.24 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -529764.95 (J) H = -440428.39 (J) S = 73.64 (J/K) V = 12.34 (cc) Cp = 39.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.71 | 25.04 | 7.25 |

quartz mass = 13.45 (gm) density = 2.56 (gm/cc)
SiO2
G = -221579.23 (J) H = -186339.30 (J) S = 29.05 (J/K) V = 5.25 (cc) Cp = 15.88 (J/K)

rhm-oxide mass = 0.16 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'"0.18Al0.13Ti0.85O3
G = -1633.63 (J) H = -1248.68 (J) S = 0.32 (J/K) V = 0.04 (cc) Cp = 0.16 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.97 | 8.84 | 71.28 | 3.29 | 6.61 |

Total solids mass = 58.10 (gm) density = 2.76 (gm/cc)
G = -913099.68 (J) H = -756961.80 (J) S = 128.70 (J/K) V = 21.06 (cc) Cp = 69.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1588701.22 (J) H = -1303190.47 (J) S = 235.35 (J/K) V = 38.07 (cc) Cp = 125.04 (J/K)

Oxygen delta moles = -0.00150515 delta grams = -0.0481631
G = 411.70 (J) H = -45.48 (J) S = -0.38 (J/K) V = -151.82 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 930.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = -0.07 COH = 1.39 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 39.62 (gm) density = 2.46 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -639303.13 (J) H = -517952.35 (J) S = 100.86 (J/K) V = 16.13 (cc) Cp = 52.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.98 | 0.95 | 14.10 | 0.36 | 0.00 | 1.52 | 0.24 | 0.22 | 0.00 | 0.00 | 2.15 | 2.74 | 4.95 | 0.25 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.38 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.02Mg0.85Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -161411.35 (J) H = -130307.25 (J) S = 25.85 (J/K) V = 3.47 (cc) Cp = 14.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.76 | 95.96 | 102.16 | 5.62 | -5.30 | 7.91 | 0.41 |

feldspar mass = 33.55 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -550328.11 (J) H = -458547.63 (J) S = 76.28 (J/K) V = 12.84 (cc) Cp = 40.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.46 | 24.91 | 7.63 |

quartz mass = 14.14 (gm) density = 2.56 (gm/cc)
SiO2
G = -232728.39 (J) H = -196138.61 (J) S = 30.41 (J/K) V = 5.52 (cc) Cp = 16.69 (J/K)

rhm-oxide mass = 0.26 (gm) density = 4.62 (gm/cc) (analysis in mole %)

Mn0.03Fe"0.72Mg0.10Fe'"0.17Al0.13Ti0.85O3
G = -2565.11 (J) H = -1966.73 (J) S = 0.50 (J/K) V = 0.06 (cc) Cp = 0.25 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.84 | 8.71 | 71.54 | 3.43 | 6.48 |

Total solids mass = 60.33 (gm) density = 2.76 (gm/cc)
G = -947032.97 (J) H = -786960.22 (J) S = 133.04 (J/K) V = 21.89 (cc) Cp = 71.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1586336.09 (J) H = -1304912.58 (J) S = 233.91 (J/K) V = 38.02 (cc) Cp = 124.65 (J/K)

Oxygen delta moles = -0.00154047 delta grams = -0.0492933
G = 417.50 (J) H = -46.00 (J) S = -0.39 (J/K) V = -154.10 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2p1a1

T = 920.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = -0.08 COH = 1.36 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 37.56 (gm) density = 2.45 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -605695.11 (J) H = -491721.07 (J) S = 95.52 (J/K) V = 15.32 (cc) Cp = 50.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.95 | 0.90 | 14.10 | 0.34 | 0.00 | 1.40 | 0.25 | 0.20 | 0.00 | 0.00 | 2.13 | 2.68 | 5.11 | 0.27 | 2.67 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.20 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.59Mg0.24)3Al2Si3O12
G = -2673.51 (J) H = -2200.79 (J) S = 0.40 (J/K) V = 0.05 (cc) Cp = 0.21 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.33 | 16.27 | 24.41 |

orthopyroxene mass = 12.36 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.02Mg0.85Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -160868.87 (J) H = -130209.71 (J) S = 25.70 (J/K) V = 3.46 (cc) Cp = 14.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.88 | 95.96 | 102.43 | 5.58 | -5.27 | 7.78 | 0.40 |

feldspar mass = 34.67 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -567874.40 (J) H = -474218.16 (J) S = 78.49 (J/K) V = 13.27 (cc) Cp = 42.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.27 | 24.68 | 8.04 |

quartz mass = 14.81 (gm) density = 2.56 (gm/cc)
SiO2
G = -243488.96 (J) H = -205650.05 (J) S = 31.71 (J/K) V = 5.79 (cc) Cp = 17.47 (J/K)

rhm-oxide mass = 0.34 (gm) density = 4.62 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.72Mg0.10Fe'"0.17Al0.13Ti0.85O3
G = -3381.25 (J) H = -2600.69 (J) S = 0.65 (J/K) V = 0.07 (cc) Cp = 0.32 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.77 | 8.55 | 71.78 | 3.57 | 6.33 |

Total solids mass = 62.39 (gm) density = 2.76 (gm/cc)
G = -978286.98 (J) H = -814879.40 (J) S = 136.95 (J/K) V = 22.64 (cc) Cp = 74.14 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1583982.09 (J) H = -1306600.48 (J) S = 232.48 (J/K) V = 37.96 (cc) Cp = 124.27 (J/K)

Oxygen delta moles = -0.00158176 delta grams = -0.0506145
G = 424.74 (J) H = -46.67 (J) S = -0.40 (J/K) V = -156.91 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 910.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = -0.09 COH = 1.34 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 35.60 (gm) density = 2.45 (gm/cc) viscosity = 6.10 (log 10 poise) (analysis in wt %)
G = -573801.70 (J) H = -466718.31 (J) S = 90.51 (J/K) V = 14.56 (cc) Cp = 47.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.01 | 0.85 | 13.94 | 0.31 | 0.00 | 1.26 | 0.26 | 0.20 | 0.00 | 0.00 | 2.11 | 2.69 | 5.26 | 0.28 | 2.82 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.53 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -20794.07 (J) H = -17163.55 (J) S = 3.07 (J/K) V = 0.39 (cc) Cp = 1.66 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.90 | 16.74 | 24.35 |

orthopyroxene mass = 11.57 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.01Mg0.87Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -150838.64 (J) H = -122492.33 (J) S = 23.96 (J/K) V = 3.25 (cc) Cp = 13.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.00 | 95.85 | 101.12 | 5.32 | -5.03 | 7.33 | 0.41 |

feldspar mass = 35.22 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.67Ca0.24Al1.24Si2.76O8
G = -575870.94 (J) H = -481924.62 (J) S = 79.40 (J/K) V = 13.48 (cc) Cp = 42.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.42 | 23.92 | 8.66 |

quartz mass = 15.61 (gm) density = 2.56 (gm/cc)
SiO2
G = -256232.80 (J) H = -216879.03 (J) S = 33.26 (J/K) V = 6.10 (cc) Cp = 18.39 (J/K)

rhm-oxide mass = 0.41 (gm) density = 4.62 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.72Mg0.10Fe'"0.17Al0.12Ti0.86O3
G = -4083.96 (J) H = -3152.08 (J) S = 0.79 (J/K) V = 0.09 (cc) Cp = 0.39 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.97 | 8.27 | 71.90 | 3.77 | 6.09 |

Total solids mass = 64.35 (gm) density = 2.76 (gm/cc)
G = -1007820.40 (J) H = -841611.61 (J) S = 140.48 (J/K) V = 23.30 (cc) Cp = 76.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1581622.11 (J) H = -1308329.92 (J) S = 230.99 (J/K) V = 37.86 (cc) Cp = 123.83 (J/K)

Oxygen delta moles = -0.00166194 delta grams = -0.0531802
G = 442.12 (J) H = -48.44 (J) S = -0.41 (J/K) V = -163.49 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 900.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.10 COH = 1.31 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 33.77 (gm) density = 2.44 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -543888.47 (J) H = -443215.18 (J) S = 85.81 (J/K) V = 13.84 (cc) Cp = 45.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.81 | 13.78 | 0.29 | 0.00 | 1.14 | 0.27 | 0.19 | 0.00 | 0.00 | 2.09 | 2.70 | 5.40 | 0.30 | 2.97 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.77 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.24)3Al2Si3O12
G = -37629.99 (J) H = -31143.86 (J) S = 5.53 (J/K) V = 0.70 (cc) Cp = 3.01 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.45 | 17.24 | 24.31 |

orthopyroxene mass = 10.84 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.89Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -141551.03 (J) H = -115329.46 (J) S = 22.35 (J/K) V = 3.04 (cc) Cp = 12.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.03 | 95.72 | 99.72 | 5.07 | -4.79 | 6.90 | 0.41 |

feldspar mass = 35.75 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.68Ca0.23Al1.23Si2.77O8
G = -583367.59 (J) H = -489240.19 (J) S = 80.23 (J/K) V = 13.69 (cc) Cp = 43.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.54 | 23.15 | 9.32 |

quartz mass = 16.36 (gm) density = 2.56 (gm/cc)
SiO2
G = -268136.00 (J) H = -227440.97 (J) S = 34.69 (J/K) V = 6.39 (cc) Cp = 19.25 (J/K)

rhm-oxide mass = 0.47 (gm) density = 4.62 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.72Mg0.10Fe'''0.16Al0.12Ti0.86O3
G = -4708.45 (J) H = -3646.71 (J) S = 0.91 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.18 | 7.99 | 72.00 | 3.97 | 5.86 |

Total solids mass = 66.18 (gm) density = 2.77 (gm/cc)
G = -1035393.06 (J) H = -866801.19 (J) S = 143.71 (J/K) V = 23.93 (cc) Cp = 78.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1579281.53 (J) H = -1310016.38 (J) S = 229.52 (J/K) V = 37.77 (cc) Cp = 123.43 (J/K)

Oxygen delta moles = -0.0017335 delta grams = -0.0554701
G = 456.84 (J) H = -49.91 (J) S = -0.43 (J/K) V = -169.08 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 32.02 (gm) density = 2.43 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -515412.73 (J) H = -420781.03 (J) S = 81.36 (J/K) V = 13.15 (cc) Cp = 42.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.77 | 13.67 | 0.26 | 0.00 | 1.02 | 0.28 | 0.19 | 0.00 | 0.00 | 2.05 | 2.72 | 5.53 | 0.31 | 3.14 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.97 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -53949.63 (J) H = -44768.52 (J) S = 7.89 (J/K) V = 1.01 (cc) Cp = 4.31 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.06 | 17.56 | 24.39 |

orthopyroxene mass = 10.06 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.90Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -131700.23 (J) H = -107658.92 (J) S = 20.67 (J/K) V = 2.83 (cc) Cp = 11.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.09 | 95.66 | 98.23 | 4.86 | -4.59 | 6.52 | 0.41 |

clinopyroxene mass = 0.11 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.78Fe"0.41Mg0.53Fe'''0.06Ti0.04Al0.24Si1.84O6
G = -1608.31 (J) H = -1342.84 (J) S = 0.23 (J/K) V = 0.03 (cc) Cp = 0.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.86 | 13.51 | 40.89 | 9.59 | -0.71 | 6.79 | 8.07 |

feldspar mass = 36.18 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.22Al1.22Si2.78O8
G = -589427.50 (J) H = -495366.09 (J) S = 80.87 (J/K) V = 13.86 (cc) Cp = 43.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.70 | 22.24 | 10.06 |

quartz mass = 17.08 (gm) density = 2.56 (gm/cc)
SiO2
G = -279622.26 (J) H = -237691.41 (J) S = 36.05 (J/K) V = 6.67 (cc) Cp = 20.08 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.15Al0.11Ti0.87O3
G = -5241.41 (J) H = -4073.77 (J) S = 1.00 (J/K) V = 0.11 (cc) Cp = 0.50 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.41 | 7.70 | 72.05 | 4.17 | 5.67 |

Total solids mass = 67.93 (gm) density = 2.77 (gm/cc)
G = -1061549.33 (J) H = -890901.56 (J) S = 146.71 (J/K) V = 24.52 (cc) Cp = 80.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1576962.06 (J) H = -1311682.59 (J) S = 228.07 (J/K) V = 37.67 (cc) Cp = 123.03 (J/K)

Oxygen delta moles = -0.00179278 delta grams = -0.0573669
G = 467.99 (J) H = -50.98 (J) S = -0.45 (J/K) V = -173.38 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2p1a1

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 30.31 (gm) density = 2.43 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -487778.95 (J) H = -398935.27 (J) S = 77.04 (J/K) V = 12.48 (cc) Cp = 40.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.01 | 0.72 | 13.63 | 0.24 | 0.00 | 0.92 | 0.29 | 0.18 | 0.00 | 0.00 | 1.99 | 2.74 | 5.63 | 0.33 | 3.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.18 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -70409.59 (J) H = -58574.56 (J) S = 10.26 (J/K) V = 1.32 (cc) Cp = 5.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.83 | 17.49 | 24.68 |

orthopyroxene mass = 9.14 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.92Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -119973.52 (J) H = -98397.93 (J) S = 18.71 (J/K) V = 2.58 (cc) Cp = 10.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.32 | 95.73 | 96.69 | 4.72 | -4.47 | 6.23 | 0.42 |

clinopyroxene mass = 0.44 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.39Mg0.54Fe'"0.06Ti0.05Al0.24Si1.85O6
G = -6399.22 (J) H = -5359.52 (J) S = 0.90 (J/K) V = 0.13 (cc) Cp = 0.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.27 | 12.86 | 39.30 | 9.62 | -0.60 | 6.34 | 8.21 |

feldspar mass = 36.49 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -593372.89 (J) H = -499715.94 (J) S = 81.22 (J/K) V = 13.99 (cc) Cp = 44.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.00 | 21.06 | 10.94 |

quartz mass = 17.80 (gm) density = 2.56 (gm/cc)
SiO2
G = -291065.94 (J) H = -247946.90 (J) S = 37.39 (J/K) V = 6.95 (cc) Cp = 20.91 (J/K)

rhm-oxide mass = 0.57 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.11Fe'"0.15Al0.11Ti0.87O3
G = -5665.13 (J) H = -4418.91 (J) S = 1.08 (J/K) V = 0.12 (cc) Cp = 0.54 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.66 | 7.40 | 72.03 | 4.37 | 5.54 |

Total solids mass = 69.63 (gm) density = 2.77 (gm/cc)
G = -1086886.29 (J) H = -914413.75 (J) S = 149.57 (J/K) V = 25.09 (cc) Cp = 82.16 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1574665.24 (J) H = -1313349.02 (J) S = 226.61 (J/K) V = 37.57 (cc) Cp = 122.64 (J/K)

Oxygen delta moles = -0.00183695 delta grams = -0.0587803
G = 474.95 (J) H = -51.59 (J) S = -0.46 (J/K) V = -176.12 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 870.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.13 COH = 1.22 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 28.66 (gm) density = 2.42 (gm/cc) viscosity = 5.97 (log 10 poise) (analysis in wt %)
G = -461074.84 (J) H = -377744.87 (J) S = 72.90 (J/K) V = 11.83 (cc) Cp = 38.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.94 | 0.68 | 13.59 | 0.22 | 0.00 | 0.83 | 0.30 | 0.18 | 0.00 | 0.00 | 1.93 | 2.76 | 5.72 | 0.35 | 3.50 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.33 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -85952.68 (J) H = -71685.05 (J) S = 12.48 (J/K) V = 1.61 (cc) Cp = 6.87 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.59 | 17.41 | 25.00 |

orthopyroxene mass = 8.27 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.95Mg0.94Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -108781.55 (J) H = -89514.18 (J) S = 16.85 (J/K) V = 2.33 (cc) Cp = 9.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.50 | 95.80 | 95.08 | 4.59 | -4.35 | 5.96 | 0.42 |

clinopyroxene mass = 0.76 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.38Mg0.56Fe'"0.05Ti0.05Al0.24Si1.85O6
G = -11002.07 (J) H = -9242.80 (J) S = 1.54 (J/K) V = 0.22 (cc) Cp = 0.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.63 | 12.24 | 37.71 | 9.66 | -0.50 | 5.91 | 8.36 |

feldspar mass = 36.82 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.12Na0.68Ca0.20Al1.20Si2.80O8
G = -597578.38 (J) H = -504300.37 (J) S = 81.60 (J/K) V = 14.13 (cc) Cp = 44.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.20 | 19.91 | 11.89 |

quartz mass = 18.49 (gm) density = 2.56 (gm/cc)
SiO2
G = -301955.60 (J) H = -257770.53 (J) S = 38.65 (J/K) V = 7.22 (cc) Cp = 21.70 (J/K)

rhm-oxide mass = 0.61 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.14Al0.11Ti0.87O3
G = -6040.07 (J) H = -4728.25 (J) S = 1.15 (J/K) V = 0.13 (cc) Cp = 0.57 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.92 | 7.11 | 71.98 | 4.56 | 5.42 |

Total solids mass = 71.28 (gm) density = 2.78 (gm/cc)
G = -1111310.35 (J) H = -937241.19 (J) S = 152.27 (J/K) V = 25.65 (cc) Cp = 83.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1572385.20 (J) H = -1314986.06 (J) S = 225.17 (J/K) V = 37.48 (cc) Cp = 122.27 (J/K)

Oxygen delta moles = -0.00187692 delta grams = -0.0600591
G = 480.62 (J) H = -52.05 (J) S = -0.47 (J/K) V = -178.39 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 27.06 (gm) density = 2.42 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -435081.70 (J) H = -357033.89 (J) S = 68.88 (J/K) V = 11.19 (cc) Cp = 36.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.84 | 0.64 | 13.54 | 0.20 | 0.00 | 0.75 | 0.32 | 0.18 | 0.00 | 0.00 | 1.88 | 2.80 | 5.78 | 0.37 | 3.71 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.42 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.25)3Al2Si3O12
G = -100731.04 (J) H = -84221.65 (J) S = 14.57 (J/K) V = 1.89 (cc) Cp = 8.05 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.33 | 17.32 | 25.35 |

orthopyroxene mass = 7.43 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.93Mg0.96Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -98029.71 (J) H = -80933.74 (J) S = 15.09 (J/K) V = 2.10 (cc) Cp = 8.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.61 | 95.86 | 93.40 | 4.47 | -4.23 | 5.69 | 0.42 |

clinopyroxene mass = 1.06 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.36Mg0.57Fe'"0.05Ti0.05Al0.24Si1.85O6
G = -15449.67 (J) H = -13018.69 (J) S = 2.15 (J/K) V = 0.31 (cc) Cp = 1.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.95 | 11.65 | 36.12 | 9.70 | -0.41 | 5.49 | 8.49 |

feldspar mass = 37.17 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.68Ca0.19Al1.19Si2.81O8
G = -602063.06 (J) H = -509136.92 (J) S = 82.01 (J/K) V = 14.28 (cc) Cp = 44.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.31 | 18.77 | 12.92 |

quartz mass = 19.15 (gm) density = 2.56 (gm/cc)
SiO2
G = -312393.65 (J) H = -267246.84 (J) S = 39.84 (J/K) V = 7.48 (cc) Cp = 22.46 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.14Al0.11Ti0.88O3
G = -6372.66 (J) H = -5006.44 (J) S = 1.21 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.20 | 6.83 | 71.91 | 4.75 | 5.30 |

Total solids mass = 72.88 (gm) density = 2.78 (gm/cc)
G = -1135039.79 (J) H = -959564.29 (J) S = 154.86 (J/K) V = 26.20 (cc) Cp = 85.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1570121.50 (J) H = -1316598.18 (J) S = 223.73 (J/K) V = 37.39 (cc) Cp = 121.91 (J/K)

Oxygen delta moles = -0.00191322 delta grams = -0.0612209
G = 485.18 (J) H = -52.38 (J) S = -0.47 (J/K) V = -180.25 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 25.39 (gm) density = 2.41 (gm/cc) viscosity = 5.84 (log 10 poise) (analysis in wt %)
G = -408120.95 (J) H = -335398.16 (J) S = 64.75 (J/K) V = 10.52 (cc) Cp = 33.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.72 | 0.59 | 13.48 | 0.19 | 0.00 | 0.68 | 0.33 | 0.17 | 0.00 | 0.00 | 1.84 | 2.86 | 5.78 | 0.40 | 3.96 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.47 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -115028.87 (J) H = -96418.47 (J) S = 16.57 (J/K) V = 2.16 (cc) Cp = 9.19 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.03 | 17.22 | 25.74 |

orthopyroxene mass = 6.62 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.92Mg0.98Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -87572.57 (J) H = -72540.73 (J) S = 13.38 (J/K) V = 1.87 (cc) Cp = 7.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.61 | 95.93 | 91.60 | 4.34 | -4.11 | 5.44 | 0.43 |

clinopyroxene mass = 1.35 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.35Mg0.58Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -19659.80 (J) H = -16616.45 (J) S = 2.71 (J/K) V = 0.40 (cc) Cp = 1.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.24 | 11.09 | 34.50 | 9.77 | -0.31 | 5.08 | 8.64 |

feldspar mass = 37.24 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.68Ca0.18Al1.18Si2.82O8
G = -601960.21 (J) H = -510118.13 (J) S = 81.77 (J/K) V = 14.31 (cc) Cp = 45.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.47 | 17.78 | 13.75 |

feldspar mass = 0.38 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.03Al1.03Si2.97O8
G = -5958.80 (J) H = -5039.77 (J) S = 0.82 (J/K) V = 0.15 (cc) Cp = 0.45 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.83 | 2.80 | 61.36 |

quartz mass = 19.82 (gm) density = 2.56 (gm/cc)
SiO2
G = -322879.83 (J) H = -276801.71 (J) S = 41.03 (J/K) V = 7.74 (cc) Cp = 23.22 (J/K)

rhm-oxide mass = 0.68 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.12Fe'"0.13Al0.10Ti0.88O3
G = -6692.72 (J) H = -5276.74 (J) S = 1.26 (J/K) V = 0.15 (cc) Cp = 0.63 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.51 | 6.54 | 71.81 | 4.94 | 5.20 |

Total solids mass = 74.55 (gm) density = 2.78 (gm/cc)
G = -1159752.79 (J) H = -982812.00 (J) S = 157.54 (J/K) V = 26.78 (cc) Cp = 87.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1567873.74 (J) H = -1318210.17 (J) S = 222.29 (J/K) V = 37.30 (cc) Cp = 121.55 (J/K)

Oxygen delta moles = -0.00194649 delta grams = -0.0622854
G = 488.79 (J) H = -52.60 (J) S = -0.48 (J/K) V = -181.77 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 840.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -13.04  delta HM = -5.09  NNO = 0.00  QFM = -0.16  COH = 1.12
IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid  mass = 23.43 (gm)  density = 2.41 (gm/cc)  viscosity = 5.70 (log 10 poise)  (analysis in wt %)
G = -376750.91 (J)  H = -309934.25 (J)  S = 60.02 (J/K)  V = 9.74 (cc)  Cp = 31.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.57 | 0.54 | 13.37 | 0.18 | 0.00 | 0.62 | 0.35 | 0.17 | 0.00 | 0.00 | 1.83 | 3.01 | 5.64 | 0.43 | 4.29 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 9.50 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -128927.17 (J)  H = -108341.63 (J)  S = 18.49 (J/K)  V = 2.42 (cc)  Cp = 10.30 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.69 | 17.10 | 26.21 |

orthopyroxene  mass = 5.84 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg1.01Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -77507.74 (J)  H = -64419.44 (J)  S = 11.76 (J/K)  V = 1.66 (cc)  Cp = 6.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.44 | 95.99 | 89.61 | 4.21 | -3.99 | 5.19 | 0.43 |

clinopyroxene  mass = 1.59 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.33Mg0.59Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -23217.67 (J)  H = -19682.71 (J)  S = 3.18 (J/K)  V = 0.47 (cc)  Cp = 1.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.52 | 10.54 | 32.82 | 9.86 | -0.22 | 4.67 | 8.80 |

feldspar  mass = 36.12 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.13Na0.69Ca0.17Al1.17Si2.83O8
G = -583218.93 (J)  H = -495332.01 (J)  S = 78.95 (J/K)  V = 13.88 (cc)  Cp = 43.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.24 | 17.37 | 13.40 |

feldspar  mass = 2.20 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.62Na0.35Ca0.03Al1.03Si2.97O8
G = -34563.26 (J)  H = -29298.62 (J)  S = 4.73 (J/K)  V = 0.86 (cc)  Cp = 2.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.45 | 2.59 | 61.96 |

quartz  mass = 20.56 (gm)  density = 2.56 (gm/cc)
SiO2
G = -334398.85 (J)  H = -287281.29 (J)  S = 42.33 (J/K)  V = 8.03 (cc)  Cp = 24.05 (J/K)

rhm-oxide  mass = 0.71 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.72Mg0.12Fe'"0.13Al0.10Ti0.89O3
G = -7057.64 (J)  H = -5584.58 (J)  S = 1.32 (J/K)  V = 0.15 (cc)  Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.86 | 6.25 | 71.67 | 5.11 | 5.11 |

Total solids  mass = 76.51 (gm)  density = 2.78 (gm/cc)

G = -1188891.25 (J)  H = -1009940.28 (J)  S = 160.76 (J/K)  V = 27.47 (cc)  Cp = 89.74 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.69 (gm/cc)
G = -1565642.16 (J)  H = -1319874.53 (J)  S = 220.79 (J/K)  V = 37.21 (cc)  Cp = 121.17 (J/K)

Oxygen  delta moles = -0.00197726  delta grams = -0.0632699
G = 491.62 (J)  H = -52.73 (J)  S = -0.49 (J/K)  V = -183.00 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 830.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -13.24  delta HM = -5.10  NNO = 0.00  QFM = -0.17  COH = 1.09  IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid  mass = 21.62 (gm)  density = 2.40 (gm/cc)  viscosity = 5.54 (log 10 poise)  (analysis in wt %)
G = -347738.65 (J)  H = -286327.38 (J)  S = 55.67 (J/K)  V = 9.02 (cc)  Cp = 29.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.38 | 0.49 | 13.25 | 0.16 | 0.00 | 0.58 | 0.38 | 0.17 | 0.00 | 0.00 | 1.82 | 3.17 | 5.49 | 0.46 | 4.65 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.43 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -141585.15 (J)  H = -119277.68 (J)  S = 20.22 (J/K)  V = 2.66 (cc)  Cp = 11.31 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.36 | 16.97 | 26.67 |

orthopyroxene  mass = 5.12 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.88Mg1.03Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -68260.89 (J)  H = -56922.04 (J)  S = 10.28 (J/K)  V = 1.46 (cc)  Cp = 5.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.32 | 96.04 | 87.67 | 4.08 | -3.87 | 4.95 | 0.44 |

clinopyroxene  mass = 1.81 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.31Mg0.61Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -26535.81 (J)  H = -22562.09 (J)  S = 3.60 (J/K)  V = 0.54 (cc)  Cp = 2.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.67 | 10.03 | 31.22 | 9.95 | -0.11 | 4.28 | 8.97 |

feldspar  mass = 35.13 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.13Na0.70Ca0.17Al1.17Si2.83O8
G = -566537.70 (J)  H = -482229.72 (J)  S = 76.42 (J/K)  V = 13.50 (cc)  Cp = 42.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.99 | 16.96 | 13.05 |

feldspar  mass = 3.84 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -60268.64 (J)  H = -51203.90 (J)  S = 8.22 (J/K)  V = 1.51 (cc)  Cp = 4.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.04 | 2.39 | 62.57 |

quartz mass = 21.24 (gm) density = 2.56 (gm/cc)
SiO2
G = -345143.02 (J) H = -297134.84 (J) S = 43.52 (J/K) V = 8.30 (cc) Cp = 24.83 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.12Fe'"0.12Al0.10Ti0.89O3
G = -7357.15 (J) H = -5842.40 (J) S = 1.37 (J/K) V = 0.16 (cc) Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.20 | 5.98 | 71.53 | 5.27 | 5.03 |

Total solids mass = 78.32 (gm) density = 2.79 (gm/cc)
G = -1215688.35 (J) H = -1035172.66 (J) S = 163.64 (J/K) V = 28.11 (cc) Cp = 91.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1563427.00 (J) H = -1321500.04 (J) S = 219.31 (J/K) V = 37.13 (cc) Cp = 120.81 (J/K)

Oxygen delta moles = -0.0020052 delta grams = -0.064164
G = 493.61 (J) H = -52.77 (J) S = -0.50 (J/K) V = -183.92 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 19.93 (gm) density = 2.39 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -320690.78 (J) H = -264260.66 (J) S = 51.62 (J/K) V = 8.34 (cc) Cp = 26.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.13 | 0.45 | 13.13 | 0.15 | 0.00 | 0.53 | 0.40 | 0.17 | 0.00 | 0.00 | 1.81 | 3.34 | 5.33 | 0.50 | 5.04 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.29 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -153166.18 (J) H = -129356.50 (J) S = 21.78 (J/K) V = 2.88 (cc) Cp = 12.23 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.04 | 16.84 | 27.12 |

orthopyroxene mass = 4.47 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.86Mg1.05Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -59722.39 (J) H = -49964.55 (J) S = 8.93 (J/K) V = 1.27 (cc) Cp = 5.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.25 | 96.11 | 85.76 | 3.96 | -3.75 | 4.72 | 0.45 |

clinopyroxene mass = 2.02 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.30Mg0.62Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -29649.07 (J) H = -25282.16 (J) S = 3.99 (J/K) V = 0.60 (cc) Cp = 2.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.69 | 9.55 | 29.69 | 10.04 | -0.00 | 3.90 | 9.14 |

feldspar mass = 34.25 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.71Ca0.17Al1.17Si2.83O8
G = -551680.43 (J) H = -470621.38 (J) S = 74.15 (J/K) V = 13.16 (cc) Cp = 41.44 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.74 | 16.57 | 12.69 |

feldspar mass = 5.33 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -83466.39 (J) H = -71072.37 (J) S = 11.34 (J/K) V = 2.09 (cc) Cp = 6.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.59 | 2.20 | 63.21 |

quartz mass = 21.89 (gm) density = 2.56 (gm/cc)
SiO2
G = -355251.78 (J) H = -306478.37 (J) S = 44.62 (J/K) V = 8.55 (cc) Cp = 25.56 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.71Mg0.13Fe'"0.11Al0.10Ti0.89O3
G = -7600.83 (J) H = -6057.28 (J) S = 1.41 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.54 | 5.72 | 71.38 | 5.41 | 4.94 |

Total solids mass = 80.00 (gm) density = 2.79 (gm/cc)
G = -1240537.07 (J) H = -1058832.61 (J) S = 166.22 (J/K) V = 28.72 (cc) Cp = 93.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1561227.84 (J) H = -1323093.27 (J) S = 217.84 (J/K) V = 37.06 (cc) Cp = 120.49 (J/K)

Oxygen delta moles = -0.00203071 delta grams = -0.0649804
G = 494.88 (J) H = -52.72 (J) S = -0.50 (J/K) V = -184.57 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 18.31 (gm) density = 2.38 (gm/cc) viscosity = 5.17 (log 10 poise) (analysis in wt %)
G = -294635.37 (J) H = -242903.20 (J) S = 47.76 (J/K) V = 7.69 (cc) Cp = 24.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.82 | 0.40 | 12.94 | 0.15 | 0.00 | 0.50 | 0.46 | 0.17 | 0.00 | 0.00 | 1.82 | 3.57 | 5.13 | 0.55 | 5.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.89 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -161153.02 (J) H = -136424.63 (J) S = 22.83 (J/K) V = 3.03 (cc) Cp = 12.87 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.01 | 16.73 | 27.26 |

orthopyroxene mass = 4.25 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.06Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -56879.40 (J) H = -47724.34 (J) S = 8.45 (J/K) V = 1.21 (cc) Cp = 4.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.16 | 96.19 | 84.78 | 3.84 | -3.64 | 4.53 | 0.45 |

clinopyroxene mass = 1.45 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.29Mg0.63Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -21342.45 (J) H = -18247.47 (J) S = 2.86 (J/K) V = 0.43 (cc) Cp = 1.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.18 | 9.17 | 28.69 | 9.90 | 0.12 | 3.58 | 9.36 |

clinopyroxene mass = 0.83 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.24Mg0.36Fe'"0.04Ti0.39Al0.72Si1.28O6
G = -12069.50 (J) H = -10353.55 (J) S = 1.58 (J/K) V = 0.23 (cc) Cp = 0.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.94 | 2.10 | 23.86 | 68.49 | 9.40 | -5.58 | 8.67 |

feldspar mass = 33.31 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.16Al1.16Si2.84O8
G = -535898.65 (J) H = -458159.11 (J) S = 71.77 (J/K) V = 12.80 (cc) Cp = 40.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.57 | 16.03 | 12.41 |

feldspar mass = 6.74 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -105527.94 (J) H = -90059.74 (J) S = 14.28 (J/K) V = 2.65 (cc) Cp = 7.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.25 | 2.02 | 63.73 |

quartz mass = 22.56 (gm) density = 2.56 (gm/cc)
SiO2
G = -365651.27 (J) H = -316108.99 (J) S = 45.74 (J/K) V = 8.81 (cc) Cp = 26.31 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.71Mg0.13Fe'"0.11Al0.10Ti0.90O3
G = -5874.16 (J) H = -4696.39 (J) S = 1.09 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.71 | 5.55 | 71.17 | 5.74 | 4.83 |

Total solids mass = 81.63 (gm) density = 2.79 (gm/cc)
G = -1264396.39 (J) H = -1081774.22 (J) S = 168.60 (J/K) V = 29.29 (cc) Cp = 95.44 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1559031.75 (J) H = -1324677.42 (J) S = 216.36 (J/K) V = 36.98 (cc) Cp = 120.19 (J/K)

Oxygen delta moles = -0.00207835 delta grams = -0.0665046
G = 501.36 (J) H = -53.23 (J) S = -0.51 (J/K) V = -187.17 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 800.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -13.87  delta HM = -5.13  NNO = 0.00  QFM = -0.20  COH = 0.99
IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid  mass = 16.74 (gm)  density = 2.37 (gm/cc)  viscosity = 4.92 (log 10 poise)  (analysis in wt %)
G = -269496.81 (J)  H = -222205.41 (J)  S = 44.07 (J/K)  V = 7.06 (cc)  Cp = 22.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.43 | 0.35 | 12.69 | 0.15 | 0.00 | 0.49 | 0.55 | 0.17 | 0.00 | 0.00 | 1.83 | 3.86 | 4.89 | 0.60 | 6.00 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 12.30 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -166290.80 (J)  H = -141094.45 (J)  S = 23.48 (J/K)  V = 3.13 (cc)  Cp = 13.29 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.20 | 16.65 | 27.15 |

orthopyroxene  mass = 4.34 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.07Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -58085.22 (J)  H = -48864.78 (J)  S = 8.59 (J/K)  V = 1.24 (cc)  Cp = 4.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.81 | 96.30 | 84.50 | 3.72 | -3.53 | 4.36 | 0.45 |

clinopyroxene  mass = 0.38 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.82Fe"0.28Mg0.63Fe'"0.04Ti0.05Al0.23Si1.87O6
G = -5616.69 (J)  H = -4814.19 (J)  S = 0.75 (J/K)  V = 0.11 (cc)  Cp = 0.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.31 | 8.87 | 28.06 | 9.60 | 0.24 | 3.32 | 9.61 |

clinopyroxene  mass = 2.19 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.24Mg0.36Fe'"0.04Ti0.39Al0.72Si1.28O6
G = -32008.79 (J)  H = -27522.44 (J)  S = 4.18 (J/K)  V = 0.62 (cc)  Cp = 2.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.94 | 2.00 | 23.57 | 68.79 | 9.62 | -5.98 | 8.93 |

feldspar  mass = 32.36 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.12Na0.72Ca0.15Al1.15Si2.85O8
G = -519937.98 (J)  H = -445480.28 (J)  S = 69.38 (J/K)  V = 12.43 (cc)  Cp = 39.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.44 | 15.40 | 12.16 |

feldspar  mass = 8.09 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -126408.00 (J)  H = -108120.74 (J)  S = 17.04 (J/K)  V = 3.18 (cc)  Cp = 9.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.97 | 1.85 | 64.18 |

quartz  mass = 23.24 (gm)  density = 2.56 (gm/cc)
SiO2
G = -376186.43 (J)  H = -325893.86 (J)  S = 46.86 (J/K)  V = 9.08 (cc)  Cp = 27.07 (J/K)

rhm-oxide  mass = 0.28 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)

Mn0.06Fe"0.71Mg0.13Fe'''0.11Al0.09Ti0.90O3
G = -2812.24 (J) H = -2255.14 (J) S = 0.52 (J/K) V = 0.06 (cc) Cp = 0.26 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.73 | 5.44 | 70.90 | 6.24 | 4.70 |

Total solids mass = 83.19 (gm) density = 2.79 (gm/cc)
G = -1287346.15 (J) H = -1104045.88 (J) S = 170.81 (J/K) V = 29.85 (cc) Cp = 97.22 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1556842.96 (J) H = -1326251.29 (J) S = 214.87 (J/K) V = 36.91 (cc) Cp = 119.94 (J/K)

Oxygen delta moles = -0.00214056 delta grams = -0.0684952
G = 511.10 (J) H = -54.07 (J) S = -0.53 (J/K) V = -190.99 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 15.27 (gm) density = 2.36 (gm/cc) viscosity = 4.66 (log 10 poise) (analysis in wt %)
G = -245808.77 (J) H = -202660.70 (J) S = 40.59 (J/K) V = 6.47 (cc) Cp = 20.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.91 | 0.30 | 12.50 | 0.15 | 0.00 | 0.47 | 0.63 | 0.16 | 0.00 | 0.00 | 1.85 | 4.14 | 4.65 | 0.66 | 6.58 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.81 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.56Mg0.27)3Al2Si3O12
G = -173026.11 (J) H = -147150.94 (J) S = 24.34 (J/K) V = 3.26 (cc) Cp = 13.83 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.22 | 16.45 | 27.32 |

orthopyroxene mass = 4.11 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.84Mg1.08Fe'''0.01Ti0.00Al0.08Si1.96O6
G = -55075.46 (J) H = -46464.76 (J) S = 8.10 (J/K) V = 1.17 (cc) Cp = 4.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.84 | 96.41 | 83.59 | 3.61 | -3.43 | 4.20 | 0.46 |

clinopyroxene mass = 2.85 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.23Mg0.36Fe'''0.03Ti0.40Al0.72Si1.27O6
G = -41643.67 (J) H = -35894.88 (J) S = 5.41 (J/K) V = 0.80 (cc) Cp = 3.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.06 | 1.91 | 23.05 | 69.55 | 9.78 | -6.38 | 9.15 |

feldspar mass = 31.60 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -507146.44 (J) H = -435468.35 (J) S = 67.42 (J/K) V = 12.14 (cc) Cp = 38.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.27 | 14.84 | 11.88 |

feldspar mass = 9.28 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.02Al1.02Si2.98O8
G = -144798.79 (J) H = -124128.02 (J) S = 19.44 (J/K) V = 3.65 (cc) Cp = 10.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.59 | 1.68 | 64.73 |

quartz mass = 23.87 (gm) density = 2.56 (gm/cc)
SiO2
G = -385883.68 (J) H = -334988.42 (J) S = 47.87 (J/K) V = 9.32 (cc) Cp = 27.77 (J/K)

rhm-oxide mass = 0.13 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.71Mg0.13Fe'''0.11Al0.09Ti0.90O3
G = -1298.17 (J) H = -1044.33 (J) S = 0.24 (J/K) V = 0.03 (cc) Cp = 0.12 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.87 | 5.28 | 70.69 | 6.56 | 4.60 |

Total solids mass = 84.66 (gm) density = 2.79 (gm/cc)
G = -1308872.31 (J) H = -1125139.72 (J) S = 172.82 (J/K) V = 30.38 (cc) Cp = 98.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1554681.08 (J) H = -1327800.42 (J) S = 213.40 (J/K) V = 36.85 (cc) Cp = 119.71 (J/K)

Oxygen delta moles = -0.00217972 delta grams = -0.0697485
G = 515.09 (J) H = -54.29 (J) S = -0.54 (J/K) V = -192.67 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 780.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.23 COH = 0.92 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 12.58 (gm) density = 2.35 (gm/cc) viscosity = 4.33 (log 10 poise) (analysis in wt %)
G = -202673.12 (J) H = -166954.40 (J) S = 33.92 (J/K) V = 5.36 (cc) Cp = 17.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.39 | 0.25 | 11.95 | 0.16 | 0.00 | 0.49 | 0.62 | 0.15 | 0.00 | 0.00 | 1.94 | 4.67 | 4.32 | 0.75 | 7.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.49 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.26)3Al2Si3O12
G = -207855.18 (J) H = -177096.20 (J) S = 29.21 (J/K) V = 3.93 (cc) Cp = 16.66 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.56 | 16.76 | 25.68 |

clinopyroxene mass = 0.44 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.24Mg0.35Fe'''0.03Ti0.39Al0.72Si1.28O6
G = -6404.50 (J) H = -5530.01 (J) S = 0.83 (J/K) V = 0.12 (cc) Cp = 0.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.74 | 1.79 | 24.15 | 68.72 | 10.27 | -6.78 | 9.59 |

clinopyroxene mass = 2.28 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.82Fe"0.28Mg0.62Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -33516.03 (J) H = -28852.98 (J) S = 4.43 (J/K) V = 0.68 (cc) Cp = 2.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.74 | 8.22 | 28.29 | 8.94 | 0.71 | 2.83 | 10.27 |

biotite mass = 1.98 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -31361.79 (J) H = -26820.68 (J) S = 4.31 (J/K) V = 0.71 (cc) Cp = 2.50 (J/K)

| annite | phlogopite |
|---|---|
| 3.15 | 96.85 |

feldspar mass = 31.90 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.74Ca0.14Al1.14Si2.86O8
G = -511329.05 (J) H = -439999.53 (J) S = 67.73 (J/K) V = 12.27 (cc) Cp = 38.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.29 | 13.96 | 11.76 |

feldspar mass = 8.76 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -136455.77 (J) H = -117236.10 (J) S = 18.25 (J/K) V = 3.44 (cc) Cp = 10.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.49 | 1.52 | 64.99 |

quartz mass = 25.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -415428.32 (J) H = -361382.27 (J) S = 51.32 (J/K) V = 10.05 (cc) Cp = 29.90 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.72Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -7387.81 (J) H = -5955.07 (J) S = 1.36 (J/K) V = 0.16 (cc) Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.94 | 5.35 | 72.38 | 6.02 | 4.32 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -184.68 (J) H = -157.57 (J) S = 0.03 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 87.35 (gm) density = 2.78 (gm/cc)
G = -1349923.13 (J) H = -1163030.40 (J) S = 177.46 (J/K) V = 31.37 (cc) Cp = 102.00 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.72 (gm/cc)
G = -1552596.25 (J) H = -1329984.79 (J) S = 211.38 (J/K) V = 36.73 (cc) Cp = 119.24 (J/K)

Oxygen delta moles = -0.00210527 delta grams = -0.0673662
G = 492.33 (J) H = -51.70 (J) S = -0.52 (J/K) V = -184.34 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2p1a1

T = 770.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.24 COH = 0.88

IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 10.97 (gm) density = 2.33 (gm/cc) viscosity = 3.93 (log 10 poise) (analysis in wt %)
G = -176821.42 (J) H = -145444.51 (J) S = 30.08 (J/K) V = 4.71 (cc) Cp = 15.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.51 | 0.20 | 11.50 | 0.17 | 0.00 | 0.52 | 0.79 | 0.13 | 0.00 | 0.00 | 2.03 | 5.18 | 3.96 | 0.85 | 8.18 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.69 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -209346.91 (J) H = -178710.04 (J) S = 29.37 (J/K) V = 3.97 (cc) Cp = 16.81 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.73 | 17.21 | 24.06 |

clinopyroxene mass = 1.84 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.88Fe"0.25Mg0.34Fe'"0.04Ti0.40Al0.71Si1.28O6
G = -26663.74 (J) H = -23065.21 (J) S = 3.45 (J/K) V = 0.52 (cc) Cp = 1.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.74 | 1.64 | 25.20 | 68.48 | 10.60 | -7.07 | 9.88 |

clinopyroxene mass = 0.96 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.82Fe"0.29Mg0.60Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -14064.24 (J) H = -12129.71 (J) S = 1.85 (J/K) V = 0.29 (cc) Cp = 1.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.95 | 7.73 | 29.31 | 8.65 | 0.99 | 2.70 | 10.67 |

biotite mass = 2.50 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -39422.08 (J) H = -33782.48 (J) S = 5.41 (J/K) V = 0.90 (cc) Cp = 3.14 (J/K)

| annite | phlogopite |
|---|---|
| 3.69 | 96.31 |

feldspar mass = 31.56 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.75Ca0.13Al1.13Si2.87O8
G = -505283.51 (J) H = -435744.67 (J) S = 66.66 (J/K) V = 12.14 (cc) Cp = 38.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.12 | 13.41 | 11.47 |

feldspar mass = 9.34 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.66Na0.33Ca0.01Al1.01Si2.99O8
G = -145157.12 (J) H = -124989.93 (J) S = 19.33 (J/K) V = 3.67 (cc) Cp = 11.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.04 | 1.37 | 65.58 |

quartz mass = 26.62 (gm) density = 2.56 (gm/cc)
SiO2
G = -429239.62 (J) H = -374166.46 (J) S = 52.80 (J/K) V = 10.40 (cc) Cp = 30.90 (J/K)

rhm-oxide mass = 0.43 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.73Mg0.11Fe'"0.11Al0.08Ti0.90O3
G = -4216.92 (J) H = -3406.35 (J) S = 0.78 (J/K) V = 0.09 (cc) Cp = 0.40 (J/K)

geikielite hematite ilmenite pyrophanite corundum
11.14 5.41 72.85 6.47 4.13

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -244.43 (J) H = -209.03 (J) S = 0.03 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 88.96 (gm) density = 2.78 (gm/cc)
G = -1373638.58 (J) H = -1186203.87 (J) S = 179.68 (J/K) V = 31.97 (cc) Cp = 103.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.72 (gm/cc)
G = -1550460.00 (J) H = -1331648.37 (J) S = 209.76 (J/K) V = 36.68 (cc) Cp = 119.08 (J/K)

Oxygen delta moles = -0.00216383 delta grams = -0.0692398
G = 500.72 (J) H = -52.38 (J) S = -0.53 (J/K) V = -187.67 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 760.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.25 COH = 0.84 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 9.50 (gm) density = 2.31 (gm/cc) viscosity = 3.49 (log 10 poise) (analysis in wt %)
G = -153205.03 (J) H = -125742.90 (J) S = 26.58 (J/K) V = 4.11 (cc) Cp = 13.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.24 | 0.16 | 11.08 | 0.18 | 0.00 | 0.54 | 0.99 | 0.12 | 0.00 | 0.00 | 2.16 | 5.70 | 3.58 | 0.99 | 9.26 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.81 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.23)3Al2Si3O12
G = -209835.24 (J) H = -179483.22 (J) S = 29.38 (J/K) V = 3.99 (cc) Cp = 16.87 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.72 | 17.59 | 22.69 |

clinopyroxene mass = 2.88 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.88Fe"0.26Mg0.33Fe'"0.03Ti0.40Al0.72Si1.28O6
G = -41653.10 (J) H = -36102.28 (J) S = 5.37 (J/K) V = 0.81 (cc) Cp = 3.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.00 | 1.51 | 26.03 | 68.86 | 10.85 | -7.36 | 10.12 |

biotite mass = 2.91 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -45867.14 (J) H = -39386.13 (J) S = 6.27 (J/K) V = 1.05 (cc) Cp = 3.66 (J/K)

| annite | phlogopite |
|---|---|
| 4.19 | 95.81 |

feldspar mass = 31.37 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.76Ca0.13Al1.13Si2.87O8
G = -501657.41 (J) H = -433564.98 (J) S = 65.91 (J/K) V = 12.06 (cc) Cp = 38.53 (J/K)

albite anorthite sanidine
75.89 12.98 11.13

feldspar mass = 9.86 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.01Al1.01Si2.99O8
G = -152959.98 (J) H = -132002.32 (J) S = 20.29 (J/K) V = 3.87 (cc) Cp = 11.68 (J/K)
albite anorthite sanidine
32.48 1.24 66.28

quartz mass = 27.39 (gm) density = 2.60 (gm/cc)
SiO2
G = -441131.97 (J) H = -386039.08 (J) S = 53.33 (J/K) V = 10.53 (cc) Cp = 36.90 (J/K)

rhm-oxide mass = 0.19 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.73Mg0.10Fe'"0.11Al0.08Ti0.91O3
G = -1808.94 (J) H = -1464.67 (J) S = 0.33 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.48 5.41 73.34 6.80 3.97

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -222.25 (J) H = -190.49 (J) S = 0.03 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 90.43 (gm) density = 2.79 (gm/cc)
G = -1395136.03 (J) H = -1208233.17 (J) S = 180.91 (J/K) V = 32.36 (cc) Cp = 110.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.74 (gm/cc)
G = -1548341.06 (J) H = -1333976.07 (J) S = 207.49 (J/K) V = 36.47 (cc) Cp = 124.17 (J/K)

Oxygen delta moles = -0.00221476 delta grams = -0.0708697
G = 507.08 (J) H = -52.84 (J) S = -0.54 (J/K) V = -190.25 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 8.08 (gm) density = 2.29 (gm/cc) viscosity = 2.96 (log 10 poise) (analysis in wt %)
G = -130506.08 (J) H = -106736.22 (J) S = 23.23 (J/K) V = 3.53 (cc) Cp = 11.39 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.08 | 0.13 | 11.01 | 0.19 | 0.00 | 0.53 | 1.18 | 0.10 | 0.00 | 0.00 | 2.40 | 6.18 | 3.20 | 1.22 | 10.79 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.70 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -207530.93 (J) H = -177885.25 (J) S = 28.97 (J/K) V = 3.96 (cc) Cp = 16.71 (J/K)
almandine grossular pyrope
60.39 17.79 21.82

clinopyroxene mass = 2.91 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.31Fe'"0.03Ti0.41Al0.74Si1.25O6
G = -41965.54 (J) H = -36460.72 (J) S = 5.38 (J/K) V = 0.81 (cc) Cp = 3.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.48 | 1.34 | 26.20 | 71.73 | 10.72 | -7.52 | 10.01 |

biotite mass = 3.11 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -48934.15 (J) H = -42111.64 (J) S = 6.67 (J/K) V = 1.12 (cc) Cp = 3.91 (J/K)

| annite | phlogopite |
|---|---|
| 4.41 | 95.59 |

feldspar mass = 31.55 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.76Ca0.13Al1.13Si2.87O8
G = -503891.09 (J) H = -436472.01 (J) S = 65.89 (J/K) V = 12.12 (cc) Cp = 39.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.36 | 13.05 | 10.58 |

feldspar mass = 10.44 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.01Al1.01Si2.99O8
G = -161726.31 (J) H = -139880.15 (J) S = 21.35 (J/K) V = 4.10 (cc) Cp = 12.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.47 | 1.13 | 67.40 |

quartz mass = 27.98 (gm) density = 2.60 (gm/cc)
SiO2
G = -450083.71 (J) H = -394723.27 (J) S = 54.11 (J/K) V = 10.74 (cc) Cp = 37.37 (J/K)

rhm-oxide mass = 0.16 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.74Mg0.10Fe'"0.10Al0.08Ti0.91O3
G = -1568.84 (J) H = -1273.99 (J) S = 0.29 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.03 | 5.18 | 74.10 | 6.71 | 3.97 |

apatite mass = 0.00 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -56.37 (J) H = -48.43 (J) S = 0.01 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Total solids mass = 91.85 (gm) density = 2.79 (gm/cc)
G = -1415756.95 (J) H = -1228855.45 (J) S = 182.67 (J/K) V = 32.89 (cc) Cp = 112.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.74 (gm/cc)
G = -1546263.03 (J) H = -1335591.67 (J) S = 205.90 (J/K) V = 36.42 (cc) Cp = 124.05 (J/K)

Oxygen delta moles = -0.00223594 delta grams = -0.0715475
G = 506.46 (J) H = -52.56 (J) S = -0.55 (J/K) V = -190.21 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 740.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.28 COH = 0.76

IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 6.55 (gm) density = 2.25 (gm/cc) viscosity = 2.23 (log 10 poise) (analysis in wt %)
G = -106259.96 (J) H = -86323.91 (J) S = 19.68 (J/K) V = 2.91 (cc) Cp = 9.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.70 | 0.09 | 10.87 | 0.20 | 0.00 | 0.54 | 1.47 | 0.09 | 0.00 | 0.00 | 2.72 | 6.90 | 2.70 | 1.53 | 13.19 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.59 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -205411.02 (J) H = -176439.00 (J) S = 28.60 (J/K) V = 3.93 (cc) Cp = 16.56 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.03 | 17.89 | 21.07 |

clinopyroxene mass = 2.95 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.30Fe'"0.03Ti0.42Al0.76Si1.23O6
G = -42518.44 (J) H = -37029.09 (J) S = 5.42 (J/K) V = 0.82 (cc) Cp = 3.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.51 | 1.22 | 26.33 | 74.14 | 10.58 | -7.66 | 9.92 |

biotite mass = 3.28 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -51472.28 (J) H = -44393.71 (J) S = 6.99 (J/K) V = 1.18 (cc) Cp = 4.11 (J/K)

| annite | phlogopite |
|---|---|
| 4.58 | 95.42 |

feldspar mass = 31.78 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.77Ca0.13Al1.13Si2.87O8
G = -507083.27 (J) H = -440221.11 (J) S = 65.99 (J/K) V = 12.20 (cc) Cp = 39.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.82 | 13.11 | 10.06 |

feldspar mass = 11.03 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -170519.48 (J) H = -147815.32 (J) S = 22.41 (J/K) V = 4.33 (cc) Cp = 13.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.48 | 1.04 | 68.48 |

quartz mass = 28.61 (gm) density = 2.61 (gm/cc)
SiO2
G = -459625.79 (J) H = -403955.69 (J) S = 54.95 (J/K) V = 10.97 (cc) Cp = 37.89 (J/K)

rhm-oxide mass = 0.14 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.75Mg0.10Fe'"0.10Al0.08Ti0.91O3
G = -1311.28 (J) H = -1068.02 (J) S = 0.24 (J/K) V = 0.03 (cc) Cp = 0.12 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.63 | 4.93 | 74.97 | 6.47 | 3.99 |

Total solids mass = 93.38 (gm) density = 2.79 (gm/cc)
G = -1437941.55 (J) H = -1250921.95 (J) S = 184.59 (J/K) V = 33.46 (cc) Cp = 114.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.75 (gm/cc)
G = -1544201.52 (J) H = -1337245.85 (J) S = 204.27 (J/K) V = 36.37 (cc) Cp = 124.05 (J/K)

Oxygen delta moles = -0.00225628 delta grams = -0.0721984
G = 505.56 (J) H = -52.25 (J) S = -0.55 (J/K) V = -190.06 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2p1a1

T = 730.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.29 COH = 0.72 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 5.12 (gm) density = 2.20 (gm/cc) viscosity = 1.35 (log 10 poise) (analysis in wt %)
G = -83576.19 (J) H = -67185.55 (J) S = 16.34 (J/K) V = 2.33 (cc) Cp = 7.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.73 | 0.06 | 10.63 | 0.21 | 0.00 | 0.56 | 1.90 | 0.07 | 0.00 | 0.00 | 3.16 | 7.86 | 2.11 | 1.96 | 16.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.50 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -203469.67 (J) H = -175139.54 (J) S = 28.24 (J/K) V = 3.90 (cc) Cp = 16.42 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.65 | 17.92 | 20.43 |

clinopyroxene mass = 3.01 (gm) density = 3.60 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.29Fe'"0.03Ti0.43Al0.78Si1.21O6
G = -43263.31 (J) H = -37766.38 (J) S = 5.48 (J/K) V = 0.84 (cc) Cp = 3.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -16.18 | 1.11 | 26.42 | 76.16 | 10.44 | -7.79 | 9.85 |

biotite mass = 3.42 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -53551.15 (J) H = -46289.67 (J) S = 7.24 (J/K) V = 1.23 (cc) Cp = 4.28 (J/K)

| annite | phlogopite |
|---|---|
| 4.69 | 95.31 |

feldspar mass = 32.09 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.77Ca0.13Al1.13Si2.87O8
G = -511464.52 (J) H = -445018.76 (J) S = 66.24 (J/K) V = 12.32 (cc) Cp = 40.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 77.28 | 13.14 | 9.58 |

feldspar mass = 11.50 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.70Na0.30Ca0.01Al1.01Si2.99O8
G = -177437.00 (J) H = -154155.12 (J) S = 23.21 (J/K) V = 4.51 (cc) Cp = 13.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.52 | 0.95 | 69.53 |

quartz mass = 29.18 (gm) density = 2.61 (gm/cc)

SiO2
G = -468371.27 (J)  H = -412517.91 (J)  S = 55.68 (J/K)  V = 11.18 (cc)  Cp = 38.34 (J/K)

rhm-oxide  mass = 0.11 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)
Mn0.06Fe"0.76Mg0.09Fe'"0.09Al0.08Ti0.91O3
G = -1023.83 (J)  H = -836.43 (J)  S = 0.19 (J/K)  V = 0.02 (cc)  Cp = 0.10 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.27 | 4.67 | 75.94 | 6.11 | 4.01 |

Total solids  mass = 94.81 (gm)  density = 2.79 (gm/cc)
G = -1458580.74 (J)  H = -1271723.81 (J)  S = 186.27 (J/K)  V = 33.99 (cc)  Cp = 116.61 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.75 (gm/cc)
G = -1542156.93 (J)  H = -1338909.36 (J)  S = 202.61 (J/K)  V = 36.32 (cc)  Cp = 124.21 (J/K)

Oxygen  delta moles = -0.00227597  delta grams = -0.0728283
G = 504.42 (J)  H = -51.92 (J)  S = -0.55 (J/K)  V = -189.83 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 3.50 (log 10 poise)  (analysis in wt %)
G = -1685929.50 (J)  H = -1240052.50 (J)  S = 283.43 (J/K)  V = 40.46 (cc)  Cp = 144.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.04 | 0.00 | 4.86 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1685929.50 (J)  H = -1240052.50 (J)  S = 283.43 (J/K)  V = 40.46 (cc)  Cp = 144.57 (J/K)

Oxygen  delta moles = 2.77556e-17  delta grams = 8.88145e-16
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 3.55 (log 10 poise)  (analysis in wt %)
G = -1683102.13 (J)  H = -1241500.15 (J)  S = 282.51 (J/K)  V = 40.43 (cc)  Cp = 144.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.04 | 0.00 | 4.86 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.55 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1683102.13 (J)  H = -1241500.15 (J)  S = 282.51 (J/K)  V = 40.43 (cc)  Cp = 144.57 (J/K)

Oxygen  delta moles = 4.25061e-06  delta grams = 0.000136014
G = -1.54 (J)  H = 0.18 (J)  S = 0.00 (J/K)  V = 0.55 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1680284.25 (J)  H = -1242947.94 (J)  S = 281.58 (J/K)  V = 40.40 (cc)  Cp = 144.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.04 | 0.00 | 4.86 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1680284.25 (J)  H = -1242947.94 (J)  S = 281.58 (J/K)  V = 40.40 (cc)  Cp = 144.56 (J/K)

Oxygen  delta moles = 8.94014e-06  delta grams = 0.000286074
G = -3.22 (J)  H = 0.38 (J)  S = 0.00 (J/K)  V = 1.15 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.66 (log 10 poise)  (analysis in wt %)
G = -1677475.92 (J)  H = -1244395.89 (J)  S = 280.65 (J/K)  V = 40.37 (cc)  Cp = 144.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.05 | 0.00 | 4.86 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.66 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1677475.92 (J)  H = -1244395.89 (J)  S = 280.65 (J/K)  V = 40.37 (cc)  Cp = 144.56 (J/K)

Oxygen  delta moles = 1.4081e-05  delta grams = 0.000450576
G = -5.04 (J)  H = 0.59 (J)  S = 0.00 (J/K)  V = 1.81 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.71 (log 10 poise)  (analysis in wt %)
G = -1674677.20 (J)  H = -1245844.00 (J)  S = 279.71 (J/K)  V = 40.34 (cc)  Cp = 144.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.05 | 0.00 | 4.85 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1674677.20 (J)  H = -1245844.00 (J)  S = 279.71 (J/K)  V = 40.34 (cc)  Cp = 144.55 (J/K)

Oxygen  delta moles = 1.96862e-05  delta grams = 0.000629934
G = -6.99 (J)  H = 0.82 (J)  S = 0.01 (J/K)  V = 2.51 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.77 (log 10 poise)  (analysis in wt %)
G = -1671888.16 (J)  H = -1247292.27 (J)  S = 278.76 (J/K)  V = 40.31 (cc)  Cp = 144.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.05 | 0.00 | 4.85 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1671888.16 (J)  H = -1247292.27 (J)  S = 278.76 (J/K)  V = 40.31 (cc)  Cp = 144.54 (J/K)

Oxygen  delta moles = 2.57692e-05  delta grams = 0.000824582
G = -9.08 (J)  H = 1.07 (J)  S = 0.01 (J/K)  V = 3.26 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 3.83 (log 10 poise) (analysis in wt %)
G = -1669108.87 (J) H = -1248740.73 (J) S = 277.81 (J/K) V = 40.28 (cc) Cp = 144.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.05 | 0.00 | 4.85 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.83 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1669108.87 (J) H = -1248740.73 (J) S = 277.81 (J/K) V = 40.28 (cc) Cp = 144.54 (J/K)

Oxygen delta moles = 3.2344e-05 delta grams = 0.00103497
G = -11.32 (J) H = 1.33 (J) S = 0.01 (J/K) V = 4.07 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 3.88 (log 10 poise) (analysis in wt %)
G = -1666339.41 (J) H = -1250189.37 (J) S = 276.85 (J/K) V = 40.25 (cc) Cp = 144.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.05 | 0.00 | 4.85 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1666339.41 (J) H = -1250189.37 (J) S = 276.85 (J/K) V = 40.25 (cc) Cp = 144.53 (J/K)

Oxygen delta moles = 3.94254e-05 delta grams = 0.00126156
G = -13.69 (J) H = 1.60 (J) S = 0.01 (J/K) V = 4.93 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1220.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.37 COH = 2.39 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 3.94 (log 10 poise) (analysis in wt %)
G = -1663579.83 (J) H = -1251638.22 (J) S = 275.89 (J/K) V = 40.22 (cc) Cp = 144.53 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.47 0.65 14.17 1.06 0.00 4.85 0.11 2.67 0.00 0.00 4.36 3.83 1.68 0.16 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.94 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1663579.83 (J) H = -1251638.22 (J) S = 275.89 (J/K) V = 40.22 (cc) Cp = 144.53 (J/K)

Oxygen delta moles = 4.70286e-05 delta grams = 0.00150486
G = -16.21 (J) H = 1.90 (J) S = 0.01 (J/K) V = 5.84 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1210.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.37 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.00 (log 10 poise) (analysis in wt %)
G = -1660830.22 (J) H = -1253087.27 (J) S = 274.92 (J/K) V = 40.19 (cc) Cp = 144.52 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.47 0.65 14.17 1.06 0.00 4.84 0.11 2.67 0.00 0.00 4.36 3.83 1.68 0.16 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.00 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1660830.22 (J) H = -1253087.27 (J) S = 274.92 (J/K) V = 40.19 (cc) Cp = 144.52 (J/K)

Oxygen delta moles = 5.51696e-05 delta grams = 0.00176536
G = -18.88 (J) H = 2.21 (J) S = 0.01 (J/K) V = 6.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1200.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.35 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.06 (log 10 poise) (analysis in wt %)
G = -1658090.53 (J) H = -1254490.05 (J) S = 273.97 (J/K) V = 40.16 (cc) Cp = 137.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.06 | 0.00 | 4.84 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.06 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1658090.53 (J) H = -1254490.05 (J) S = 273.97 (J/K) V = 40.16 (cc) Cp = 137.72 (J/K)

Oxygen delta moles = 6.3865e-05 delta grams = 0.0020436
G = -21.69 (J) H = 2.53 (J) S = 0.02 (J/K) V = 7.82 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1190.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.34 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.12 (log 10 poise) (analysis in wt %)
G = -1655360.52 (J) H = -1255871.54 (J) S = 273.03 (J/K) V = 40.13 (cc) Cp = 137.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.06 | 0.00 | 4.84 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.12 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1655360.52 (J) H = -1255871.54 (J) S = 273.03 (J/K) V = 40.13 (cc) Cp = 137.70 (J/K)

Oxygen delta moles = 7.31323e-05 delta grams = 0.00234015
G = -24.64 (J) H = 2.87 (J) S = 0.02 (J/K) V = 8.90 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 99.62 (gm) density = 2.49 (gm/cc) viscosity = 4.19 (log 10 poise) (analysis in wt %)
G = -1646696.56 (J) H = -1252782.11 (J) S = 271.08 (J/K) V = 39.97 (cc) Cp = 137.08 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.51 0.65 14.21 1.06 0.00 4.80 0.11 2.57 0.00 0.00 4.37 3.84 1.68 0.16 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.38 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.45Mg1.45Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -5932.89 (J) H = -4608.49 (J) S = 0.91 (J/K) V = 0.12 (cc) Cp = 0.47 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-46.19 95.51 44.91 3.29 -3.03 5.27 0.23

Total solids mass = 0.38 (gm) density = 3.29 (gm/cc)
G = -5932.89 (J) H = -4608.49 (J) S = 0.91 (J/K) V = 0.12 (cc) Cp = 0.47 (J/K)

Viscosity of the System: 4.20 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1652629.46 (J) H = -1257390.60 (J) S = 271.99 (J/K) V = 40.08 (cc) Cp = 137.55 (J/K)

Oxygen delta moles = 6.29646e-05 delta grams = 0.00201479
G = -21.06 (J) H = 2.45 (J) S = 0.02 (J/K) V = 7.61 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1170.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.35 COH = 2.30 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 98.93 (gm) density = 2.49 (gm/cc) viscosity = 4.29 (log 10 poise) (analysis in wt %)
G = -1633233.57 (J) H = -1246050.64 (J) S = 268.29 (J/K) V = 39.70 (cc) Cp = 135.97 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.59 0.65 14.30 1.05 0.00 4.74 0.11 2.41 0.00 0.00 4.40 3.87 1.69 0.16 1.02 0.00 0.00 0.00 0.00

orthopyroxene mass = 1.07 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.47Mg1.43Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -16665.52 (J) H = -12967.72 (J) S = 2.56 (J/K) V = 0.33 (cc) Cp = 1.33 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-47.68 95.27 46.53 3.37 -3.10 5.38 0.24

Total solids mass = 1.07 (gm) density = 3.30 (gm/cc)
G = -16665.52 (J) H = -12967.72 (J) S = 2.56 (J/K) V = 0.33 (cc) Cp = 1.33 (J/K)

Viscosity of the System: 4.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1649899.09 (J) H = -1259018.36 (J) S = 270.85 (J/K) V = 40.02 (cc) Cp = 137.30 (J/K)

Oxygen delta moles = 3.38333e-05 delta grams = 0.00108262
G = -11.23 (J) H = 1.30 (J) S = 0.01 (J/K) V = 4.06 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1160.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.35  COH = 2.29  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.25 (gm)  density = 2.49 (gm/cc)  viscosity = 4.38 (log 10 poise)  (analysis in wt %)
G = -1620167.06 (J)  H = -1239579.55 (J)  S = 265.56 (J/K)  V = 39.43 (cc)  Cp = 134.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.68 | 0.66 | 14.38 | 1.05 | 0.00 | 4.66 | 0.11 | 2.25 | 0.00 | 0.00 | 4.42 | 3.89 | 1.71 | 0.16 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.75 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.48Mg1.41Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -27011.66 (J)  H = -21054.43 (J)  S = 4.16 (J/K)  V = 0.53 (cc)  Cp = 2.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -49.20 | 95.01 | 48.19 | 3.45 | -3.18 | 5.48 | 0.25 |

Total solids  mass = 1.75 (gm)  density = 3.31 (gm/cc)
G = -27011.66 (J)  H = -21054.43 (J)  S = 4.16 (J/K)  V = 0.53 (cc)  Cp = 2.16 (J/K)

Viscosity of the System: 4.40 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1647178.72 (J)  H = -1260633.98 (J)  S = 269.72 (J/K)  V = 39.96 (cc)  Cp = 137.06 (J/K)

Oxygen  delta moles = 2.18896e-06  delta grams = 7.00442e-05
G = -0.72 (J)  H = 0.08 (J)  S = 0.00 (J/K)  V = 0.26 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1150.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.34  COH = 2.27  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.59 (gm)  density = 2.49 (gm/cc)  viscosity = 4.47 (log 10 poise)  (analysis in wt %)
G = -1607467.49 (J)  H = -1233348.33 (J)  S = 262.88 (J/K)  V = 39.18 (cc)  Cp = 133.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.77 | 0.66 | 14.46 | 1.04 | 0.00 | 4.58 | 0.11 | 2.10 | 0.00 | 0.00 | 4.44 | 3.92 | 1.72 | 0.17 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.41 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.50Mg1.39Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -37000.77 (J)  H = -28889.97 (J)  S = 5.70 (J/K)  V = 0.73 (cc)  Cp = 2.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.76 | 94.75 | 49.88 | 3.53 | -3.26 | 5.60 | 0.26 |

Total solids  mass = 2.41 (gm)  density = 3.32 (gm/cc)

G = -37000.77 (J)  H = -28889.97 (J)  S = 5.70 (J/K)  V = 0.73 (cc)  Cp = 2.97 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1644468.26 (J)  H = -1262238.31 (J)  S = 268.58 (J/K)  V = 39.90 (cc)  Cp = 136.82 (J/K)

Oxygen  delta moles = -3.21152e-05  delta grams = -0.00102765
G = 10.49 (J)  H = -1.21 (J)  S = -0.01 (J/K)  V = -3.80 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1140.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.34  COH = 2.25  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.94 (gm)  density = 2.49 (gm/cc)  viscosity = 4.57 (log 10 poise)  (analysis in wt %)
G = -1595108.09 (J)  H = -1227338.30 (J)  S = 260.25 (J/K)  V = 38.93 (cc)  Cp = 132.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.85 | 0.67 | 14.54 | 1.02 | 0.00 | 4.50 | 0.11 | 1.96 | 0.00 | 0.00 | 4.46 | 3.95 | 1.73 | 0.17 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.06 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.52Mg1.37Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -46659.58 (J)  H = -36493.77 (J)  S = 7.19 (J/K)  V = 0.92 (cc)  Cp = 3.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.35 | 94.48 | 51.61 | 3.62 | -3.35 | 5.71 | 0.27 |

Total solids  mass = 3.06 (gm)  density = 3.32 (gm/cc)
G = -46659.58 (J)  H = -36493.77 (J)  S = 7.19 (J/K)  V = 0.92 (cc)  Cp = 3.75 (J/K)

Viscosity of the System: 4.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1641767.66 (J)  H = -1263832.08 (J)  S = 267.44 (J/K)  V = 39.85 (cc)  Cp = 136.59 (J/K)

Oxygen  delta moles = -6.92122e-05  delta grams = -0.00221471
G = 22.44 (J)  H = -2.59 (J)  S = -0.02 (J/K)  V = -8.13 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1130.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.33  COH = 2.23  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.30 (gm)  density = 2.49 (gm/cc)  viscosity = 4.66 (log 10 poise)  (analysis in wt %)
G = -1583064.84 (J)  H = -1221532.62 (J)  S = 257.66 (J/K)  V = 38.68 (cc)  Cp = 131.84 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

65.94 0.67 14.62 1.01 0.00 4.41 0.12 1.82 0.00 0.00 4.48 3.97 1.74 0.17 1.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.69 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.53Mg1.35Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -56012.05 (J) H = -43883.34 (J) S = 8.64 (J/K) V = 1.11 (cc) Cp = 4.52 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-53.95 94.20 53.36 3.71 -3.44 5.84 0.28

Total solids mass = 3.69 (gm) density = 3.33 (gm/cc)
G = -56012.05 (J) H = -43883.34 (J) S = 8.64 (J/K) V = 1.11 (cc) Cp = 4.52 (J/K)

Viscosity of the System: 4.71 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1639076.89 (J) H = -1265415.95 (J) S = 266.30 (J/K) V = 39.79 (cc) Cp = 136.36 (J/K)

Oxygen delta moles = -0.000109218 delta grams = -0.00349485
G = 35.12 (J) H = -4.05 (J) S = -0.03 (J/K) V = -12.74 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1120.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.22 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 95.68 (gm) density = 2.49 (gm/cc) viscosity = 4.76 (log 10 poise) (analysis in wt %)
G = -1571316.47 (J) H = -1215916.26 (J) S = 255.11 (J/K) V = 38.44 (cc) Cp = 130.87 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.04 0.67 14.70 1.00 0.00 4.31 0.12 1.69 0.00 0.00 4.49 4.00 1.75 0.17 1.06 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.31 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.55Mg1.32Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -65079.45 (J) H = -51074.25 (J) S = 10.05 (J/K) V = 1.29 (cc) Cp = 5.26 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-55.58 93.91 55.14 3.81 -3.53 5.96 0.30

Total solids mass = 4.31 (gm) density = 3.34 (gm/cc)
G = -65079.45 (J) H = -51074.25 (J) S = 10.05 (J/K) V = 1.29 (cc) Cp = 5.26 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1636395.92 (J) H = -1266990.51 (J) S = 265.16 (J/K) V = 39.73 (cc) Cp = 136.13 (J/K)

Oxygen delta moles = -0.00015223 delta grams = -0.00487116
G = 48.57 (J) H = -5.59 (J) S = -0.04 (J/K) V = -17.63 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1110.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.20  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.07 (gm)  density = 2.49 (gm/cc)  viscosity = 4.86 (log 10 poise)  (analysis in wt %)
G = -1559844.39 (J)  H = -1210476.02 (J)  S = 252.59 (J/K)  V = 38.21 (cc)  Cp = 129.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.13 | 0.68 | 14.78 | 0.98 | 0.00 | 4.21 | 0.12 | 1.57 | 0.00 | 0.00 | 4.51 | 4.02 | 1.76 | 0.17 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.93 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.57Mg1.30Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -73880.36 (J)  H = -58080.22 (J)  S = 11.42 (J/K)  V = 1.47 (cc)  Cp = 5.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.23 | 93.61 | 56.94 | 3.91 | -3.63 | 6.09 | 0.31 |

Total solids  mass = 4.93 (gm)  density = 3.35 (gm/cc)
G = -73880.36 (J)  H = -58080.22 (J)  S = 11.42 (J/K)  V = 1.47 (cc)  Cp = 5.99 (J/K)

Viscosity of the System: 4.93 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.52 (gm/cc)
G = -1633724.74 (J)  H = -1268556.24 (J)  S = 264.01 (J/K)  V = 39.68 (cc)  Cp = 135.91 (J/K)

Oxygen  delta moles = -0.000198321  delta grams = -0.00634604
G = 62.77 (J)  H = -7.21 (J)  S = -0.05 (J/K)  V = -22.81 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1100.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.31  COH = 2.18  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.46 (gm)  density = 2.49 (gm/cc)  viscosity = 4.96 (log 10 poise)  (analysis in wt %)
G = -1548632.59 (J)  H = -1205200.48 (J)  S = 250.11 (J/K)  V = 37.98 (cc)  Cp = 129.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.23 | 0.68 | 14.86 | 0.97 | 0.00 | 4.10 | 0.12 | 1.46 | 0.00 | 0.00 | 4.52 | 4.05 | 1.77 | 0.17 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.53 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.59Mg1.28Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -82430.77 (J)  H = -64913.06 (J)  S = 12.76 (J/K)  V = 1.65 (cc)  Cp = 6.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.88 | 93.31 | 58.74 | 4.01 | -3.74 | 6.23 | 0.32 |

Total solids  mass = 5.53 (gm)  density = 3.36 (gm/cc)
G = -82430.77 (J)  H = -64913.06 (J)  S = 12.76 (J/K)  V = 1.65 (cc)  Cp = 6.69 (J/K)

Viscosity of the System: 5.03 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1631063.37 (J) H = -1270113.54 (J) S = 262.86 (J/K) V = 39.62 (cc) Cp = 135.69 (J/K)

Oxygen delta moles = -0.000247544 delta grams = -0.00792112
G = 77.72 (J) H = -8.90 (J) S = -0.06 (J/K) V = -28.26 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1090.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.16 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 92.18 (gm) density = 2.48 (gm/cc) viscosity = 5.06 (log 10 poise) (analysis in wt %)
G = -1509490.24 (J) H = -1177890.64 (J) S = 243.26 (J/K) V = 37.10 (cc) Cp = 125.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.51 | 0.70 | 14.76 | 0.96 | 0.00 | 4.02 | 0.12 | 1.34 | 0.00 | 0.00 | 4.47 | 4.04 | 1.81 | 0.18 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.29 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.61Mg1.25Fe"'0.03Ti0.00Al0.11Si1.93O6
G = -93092.48 (J) H = -73416.93 (J) S = 14.43 (J/K) V = 1.87 (cc) Cp = 7.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.15 | 93.16 | 61.09 | 4.04 | -3.76 | 6.29 | 0.33 |

feldspar mass = 1.52 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.55Ca0.43Al1.43Si2.57O8
G = -25816.01 (J) H = -20821.73 (J) S = 3.66 (J/K) V = 0.58 (cc) Cp = 1.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.10 | 43.27 | 1.63 |

Total solids mass = 7.81 (gm) density = 3.19 (gm/cc)
G = -118908.49 (J) H = -94238.66 (J) S = 18.10 (J/K) V = 2.45 (cc) Cp = 9.45 (J/K)

Viscosity of the System: 5.17 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1628398.73 (J) H = -1272129.30 (J) S = 261.36 (J/K) V = 39.54 (cc) Cp = 135.13 (J/K)

Oxygen delta moles = -0.000325434 delta grams = -0.0104135
G = 101.34 (J) H = -11.59 (J) S = -0.08 (J/K) V = -36.88 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1080.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.30 COH = 2.14 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 88.08 (gm) density = 2.48 (gm/cc) viscosity = 5.15 (log 10 poise) (analysis in wt %)
G = -1440407.98 (J) H = -1126803.70 (J) S = 231.76 (J/K) V = 35.52 (cc) Cp = 119.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.99 | 0.73 | 14.45 | 0.95 | 0.00 | 3.97 | 0.13 | 1.22 | 0.00 | 0.00 | 4.35 | 4.00 | 1.89 | 0.18 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.20 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.64Mg1.22Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -105667.11 (J) H = -83433.33 (J) S = 16.43 (J/K) V = 2.13 (cc) Cp = 8.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.16 | 93.20 | 64.10 | 3.97 | -3.69 | 6.26 | 0.33 |

feldspar mass = 4.71 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.56Ca0.42Al1.42Si2.58O8
G = -79658.42 (J) H = -64385.99 (J) S = 11.29 (J/K) V = 1.79 (cc) Cp = 5.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 56.04 | 42.23 | 1.72 |

Total solids mass = 11.91 (gm) density = 3.04 (gm/cc)
G = -185325.53 (J) H = -147819.32 (J) S = 27.72 (J/K) V = 3.92 (cc) Cp = 14.40 (J/K)

Viscosity of the System: 5.35 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1625733.51 (J) H = -1274623.02 (J) S = 259.48 (J/K) V = 39.44 (cc) Cp = 134.19 (J/K)

Oxygen delta moles = -0.00043748 delta grams = -0.0139988
G = 135.12 (J) H = -15.42 (J) S = -0.11 (J/K) V = -49.22 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1070.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.30 COH = 2.12 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 84.27 (gm) density = 2.48 (gm/cc) viscosity = 5.25 (log 10 poise) (analysis in wt %)
G = -1376442.63 (J) H = -1079506.52 (J) S = 221.07 (J/K) V = 34.05 (cc) Cp = 114.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.48 | 0.76 | 14.15 | 0.94 | 0.00 | 3.90 | 0.13 | 1.11 | 0.00 | 0.00 | 4.24 | 3.94 | 1.96 | 0.19 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.06 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.67Mg1.19Fe'"0.03Ti0.00Al0.10Si1.93O6
G = -117184.41 (J) H = -92641.21 (J) S = 18.27 (J/K) V = 2.37 (cc) Cp = 9.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.14 | 93.25 | 67.06 | 3.91 | -3.63 | 6.23 | 0.32 |

feldspar mass = 7.66 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.57Ca0.41Al1.41Si2.59O8
G = -129458.15 (J) H = -104863.96 (J) S = 18.31 (J/K) V = 2.92 (cc) Cp = 9.36 (J/K)

albite anorthite sanidine
56.90 41.28 1.82

Total solids mass = 15.71 (gm) density = 2.97 (gm/cc)
G = -246642.56 (J) H = -197505.17 (J) S = 36.58 (J/K) V = 5.29 (cc) Cp = 18.99 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1623085.19 (J) H = -1277011.69 (J) S = 257.66 (J/K) V = 39.34 (cc) Cp = 133.33 (J/K)

Oxygen delta moles = -0.00055261 delta grams = -0.0176829
G = 169.27 (J) H = -19.28 (J) S = -0.14 (J/K) V = -61.71 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1060.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.29 COH = 2.10 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 80.72 (gm) density = 2.47 (gm/cc) viscosity = 5.35 (log 10 poise) (analysis in wt %)
G = -1317138.59 (J) H = -1035662.44 (J) S = 211.14 (J/K) V = 32.68 (cc) Cp = 109.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.96 | 0.80 | 13.87 | 0.92 | 0.00 | 3.81 | 0.14 | 1.01 | 0.00 | 0.00 | 4.14 | 3.88 | 2.03 | 0.20 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.86 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.70Mg1.17Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -127767.66 (J) H = -101137.31 (J) S = 19.98 (J/K) V = 2.60 (cc) Cp = 10.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.06 | 93.30 | 69.96 | 3.85 | -3.57 | 6.19 | 0.32 |

feldspar mass = 10.40 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.58Ca0.40Al1.40Si2.60O8
G = -175547.22 (J) H = -142505.75 (J) S = 24.78 (J/K) V = 3.97 (cc) Cp = 12.70 (J/K)

albite anorthite sanidine
57.67 40.41 1.92

Total solids mass = 19.26 (gm) density = 2.93 (gm/cc)
G = -303314.87 (J) H = -243643.06 (J) S = 44.76 (J/K) V = 6.56 (cc) Cp = 23.24 (J/K)

Viscosity of the System: 5.70 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1620453.47 (J) H = -1279305.50 (J) S = 255.90 (J/K) V = 39.24 (cc) Cp = 132.53 (J/K)

Oxygen delta moles = -0.000670307 delta grams = -0.021449
G = 203.62 (J) H = -23.14 (J) S = -0.17 (J/K) V = -74.30 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1050.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.29  COH = 2.08  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 77.35 (gm)  density = 2.46 (gm/cc)  viscosity = 5.45 (log 10 poise)  (analysis in wt %)
G = -1261563.55 (J)  H = -994630.00 (J)  S = 201.74 (J/K)  V = 31.39 (cc)  Cp = 104.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.47 | 0.83 | 13.61 | 0.89 | 0.00 | 3.66 | 0.14 | 0.92 | 0.00 | 0.00 | 4.03 | 3.82 | 2.11 | 0.21 | 1.31 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.34 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.72Mg1.14Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -119398.30 (J)  H = -94654.88 (J)  S = 18.70 (J/K)  V = 2.44 (cc)  Cp = 9.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.58 | 93.41 | 72.43 | 3.79 | -3.51 | 6.14 | 0.32 |

clinopyroxene  mass = 1.42 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.75Mg1.00Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -20118.72 (J)  H = -15896.65 (J)  S = 3.19 (J/K)  V = 0.42 (cc)  Cp = 1.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.29 | 83.92 | 74.64 | 4.72 | -4.13 | 8.17 | 0.97 |

feldspar  mass = 12.86 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.02Na0.59Ca0.39Al1.39Si2.61O8
G = -216757.61 (J)  H = -176339.43 (J)  S = 30.55 (J/K)  V = 4.91 (cc)  Cp = 15.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.50 | 39.48 | 2.01 |

Total solids  mass = 22.62 (gm)  density = 2.91 (gm/cc)
G = -356274.63 (J)  H = -286890.95 (J)  S = 52.44 (J/K)  V = 7.76 (cc)  Cp = 27.23 (J/K)

Viscosity of the System: 5.89 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.55 (gm/cc)
G = -1617838.18 (J)  H = -1281520.96 (J)  S = 254.18 (J/K)  V = 39.15 (cc)  Cp = 131.74 (J/K)

Oxygen  delta moles = -0.000789936  delta grams = -0.025277
G = 237.96 (J)  H = -26.99 (J)  S = -0.20 (J/K)  V = -86.90 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1040.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.28  COH = 2.06  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 74.24 (gm)  density = 2.46 (gm/cc)  viscosity = 5.55 (log 10 poise)  (analysis in wt %)
G = -1210161.11 (J)  H = -956671.85 (J)  S = 193.04 (J/K)  V = 30.19 (cc)  Cp = 100.11 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

68.97 0.86 13.36 0.86 0.00 3.50 0.15 0.84 0.00 0.00 3.94 3.75 2.18 0.22 1.36 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.14 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.75Mg1.12Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -115659.91 (J) H = -91832.77 (J) S = 18.15 (J/K) V = 2.37 (cc) Cp = 9.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.04 | 93.50 | 74.85 | 3.74 | -3.46 | 6.08 | 0.31 |

clinopyroxene mass = 2.43 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.77Mg0.98Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -34157.13 (J) H = -27033.04 (J) S = 5.43 (J/K) V = 0.71 (cc) Cp = 2.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.39 | 83.90 | 76.85 | 4.63 | -4.02 | 8.06 | 0.98 |

feldspar mass = 15.17 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.59Ca0.39Al1.39Si2.61O8
G = -255261.92 (J) H = -208114.99 (J) S = 35.90 (J/K) V = 5.79 (cc) Cp = 18.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.24 | 38.66 | 2.11 |

Total solids mass = 25.73 (gm) density = 2.90 (gm/cc)
G = -405078.95 (J) H = -326980.80 (J) S = 59.47 (J/K) V = 8.87 (cc) Cp = 30.91 (J/K)

Viscosity of the System: 6.08 (log 10 poise)

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1615240.06 (J) H = -1283652.65 (J) S = 252.51 (J/K) V = 39.06 (cc) Cp = 131.02 (J/K)

Oxygen delta moles = -0.000909257 delta grams = -0.0290951
G = 271.60 (J) H = -30.74 (J) S = -0.23 (J/K) V = -99.27 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1030.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.27 COH = 2.04 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 71.35 (gm) density = 2.45 (gm/cc) viscosity = 5.65 (log 10 poise) (analysis in wt %)
G = -1162573.83 (J) H = -921530.94 (J) S = 184.97 (J/K) V = 29.08 (cc) Cp = 96.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.46 | 0.90 | 13.11 | 0.83 | 0.00 | 3.35 | 0.16 | 0.77 | 0.00 | 0.00 | 3.86 | 3.68 | 2.26 | 0.23 | 1.42 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.15 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.77Mg1.10Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -115117.44 (J) H = -91547.68 (J) S = 18.09 (J/K) V = 2.37 (cc) Cp = 9.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.40 | 93.59 | 77.20 | 3.69 | -3.40 | 6.02 | 0.31 |

clinopyroxene mass = 3.14 (gm) density = 3.44 (gm/cc) (analysis in mole %)

cpx Na0.01Ca0.15Fe"0.79Mg0.96Fe'"0.04Ti0.00Al0.13Si1.91O6
G = -43818.82 (J) H = -34738.48 (J) S = 6.97 (J/K) V = 0.91 (cc) Cp = 3.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.31 | 83.80 | 78.95 | 4.53 | -3.90 | 7.94 | 0.98 |

feldspar mass = 17.33 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.60Ca0.38Al1.38Si2.62O8
G = -291148.69 (J) H = -237892.31 (J) S = 40.87 (J/K) V = 6.61 (cc) Cp = 21.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.88 | 37.92 | 2.20 |

Total solids mass = 28.62 (gm) density = 2.89 (gm/cc)
G = -450084.96 (J) H = -364178.47 (J) S = 65.92 (J/K) V = 9.90 (cc) Cp = 34.48 (J/K)

Viscosity of the System: 6.27 (log 10 poise)

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1612658.80 (J) H = -1285709.41 (J) S = 250.89 (J/K) V = 38.98 (cc) Cp = 130.51 (J/K)

Oxygen delta moles = -0.00102798 delta grams = -0.032894
G = 304.46 (J) H = -34.38 (J) S = -0.26 (J/K) V = -111.38 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1020.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.27 COH = 2.02 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 68.67 (gm) density = 2.45 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -1118495.62 (J) H = -888984.50 (J) S = 177.48 (J/K) V = 28.05 (cc) Cp = 92.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.94 | 0.93 | 12.87 | 0.80 | 0.00 | 3.18 | 0.16 | 0.70 | 0.00 | 0.00 | 3.78 | 3.60 | 2.33 | 0.24 | 1.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.37 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.79Mg1.08Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -117288.24 (J) H = -93427.59 (J) S = 18.45 (J/K) V = 2.42 (cc) Cp = 9.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.66 | 93.66 | 79.46 | 3.64 | -3.35 | 5.95 | 0.31 |

clinopyroxene mass = 3.58 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.81Mg0.94Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -49721.98 (J) H = -39488.06 (J) S = 7.91 (J/K) V = 1.04 (cc) Cp = 4.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.03 | 83.63 | 80.94 | 4.43 | -3.79 | 7.82 | 0.99 |

feldspar mass = 19.34 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.60Ca0.37Al1.37Si2.63O8
G = -324588.34 (J) H = -265797.98 (J) S = 45.46 (J/K) V = 7.39 (cc) Cp = 23.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.46 | 37.26 | 2.29 |

Total solids mass = 31.29 (gm) density = 2.88 (gm/cc)
G = -491598.56 (J) H = -398713.63 (J) S = 71.83 (J/K) V = 10.85 (cc) Cp = 37.65 (J/K)

Viscosity of the System: 6.46 (log 10 poise)

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1610094.18 (J) H = -1287698.13 (J) S = 249.31 (J/K) V = 38.90 (cc) Cp = 129.91 (J/K)

Oxygen delta moles = -0.00114568 delta grams = -0.0366605
G = 336.43 (J) H = -37.90 (J) S = -0.29 (J/K) V = -123.18 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1010.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.26 COH = 2.00 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 66.19 (gm) density = 2.44 (gm/cc) viscosity = 5.85 (log 10 poise) (analysis in wt %)
G = -1077652.79 (J) H = -858833.87 (J) S = 170.53 (J/K) V = 27.09 (cc) Cp = 88.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.41 | 0.96 | 12.63 | 0.77 | 0.00 | 3.02 | 0.17 | 0.64 | 0.00 | 0.00 | 3.72 | 3.51 | 2.40 | 0.24 | 1.53 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.73 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.82Mg1.06Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -121625.46 (J) H = -97047.56 (J) S = 19.15 (J/K) V = 2.52 (cc) Cp = 10.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.81 | 93.73 | 81.62 | 3.58 | -3.29 | 5.87 | 0.30 |

clinopyroxene mass = 3.81 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.83Mg0.92Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -52536.14 (J) H = -41799.96 (J) S = 8.37 (J/K) V = 1.10 (cc) Cp = 4.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.53 | 83.39 | 82.80 | 4.34 | -3.67 | 7.68 | 1.00 |

feldspar mass = 21.23 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.61Ca0.37Al1.37Si2.63O8
G = -355731.69 (J) H = -291942.58 (J) S = 49.71 (J/K) V = 8.11 (cc) Cp = 26.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.96 | 36.67 | 2.37 |

Total solids mass = 33.77 (gm) density = 2.88 (gm/cc)
G = -529893.29 (J) H = -430790.09 (J) S = 77.23 (J/K) V = 11.73 (cc) Cp = 40.58 (J/K)

Viscosity of the System: 6.65 (log 10 poise)

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1607546.08 (J) H = -1289623.97 (J) S = 247.77 (J/K) V = 38.83 (cc) Cp = 129.35 (J/K)

Oxygen delta moles = -0.0012619 delta grams = -0.0403792

G = 367.37 (J)  H = -41.29 (J)  S = -0.32 (J/K)  V = -134.63 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 1000.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.25  COH = 1.98 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 63.89 (gm)  density = 2.44 (gm/cc)  viscosity = 5.95 (log 10 poise)  (analysis in wt %)
G = -1039793.60 (J)  H = -830896.25 (J)  S = 164.08 (J/K)  V = 26.20 (cc)  Cp = 85.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.87 | 1.00 | 12.39 | 0.73 | 0.00 | 2.85 | 0.17 | 0.59 | 0.00 | 0.00 | 3.67 | 3.42 | 2.47 | 0.25 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.22 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.84Mg1.04Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -127556.00 (J)  H = -101959.34 (J)  S = 20.10 (J/K)  V = 2.66 (cc)  Cp = 10.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.82 | 93.78 | 83.67 | 3.53 | -3.23 | 5.78 | 0.30 |

clinopyroxene  mass = 3.86 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.85Mg0.90Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -52945.86 (J)  H = -42207.09 (J)  S = 8.43 (J/K)  V = 1.11 (cc)  Cp = 4.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.80 | 83.06 | 84.51 | 4.24 | -3.56 | 7.53 | 1.01 |

feldspar  mass = 22.99 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.02Na0.61Ca0.36Al1.36Si2.64O8
G = -384718.96 (J)  H = -316429.42 (J)  S = 53.64 (J/K)  V = 8.78 (cc)  Cp = 28.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.41 | 36.14 | 2.45 |

Total solids  mass = 36.07 (gm)  density = 2.87 (gm/cc)
G = -565220.83 (J)  H = -460595.84 (J)  S = 82.18 (J/K)  V = 12.55 (cc)  Cp = 43.29 (J/K)

Viscosity of the System: 6.85 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.58 (gm/cc)
G = -1605014.43 (J)  H = -1291492.09 (J)  S = 246.26 (J/K)  V = 38.76 (cc)  Cp = 128.83 (J/K)

Oxygen  delta moles = -0.00137607  delta grams = -0.0440326
G = 397.13 (J)  H = -44.54 (J)  S = -0.35 (J/K)  V = -145.66 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 990.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.25  COH = 1.96  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 61.75 (gm) density = 2.43 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -1004684.69 (J) H = -805001.90 (J) S = 158.08 (J/K) V = 25.38 (cc) Cp = 82.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.31 | 1.03 | 12.16 | 0.70 | 0.00 | 2.69 | 0.18 | 0.54 | 0.00 | 0.00 | 3.62 | 3.33 | 2.54 | 0.26 | 1.64 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.78 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.86Mg1.02Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -134512.03 (J) H = -107716.20 (J) S = 21.21 (J/K) V = 2.81 (cc) Cp = 11.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.70 | 93.83 | 85.60 | 3.47 | -3.17 | 5.69 | 0.29 |

clinopyroxene mass = 3.78 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.86Mg0.88Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -51620.55 (J) H = -41233.45 (J) S = 8.22 (J/K) V = 1.09 (cc) Cp = 4.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.80 | 82.64 | 86.06 | 4.15 | -3.44 | 7.37 | 1.02 |

feldspar mass = 24.64 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.62Ca0.36Al1.36Si2.64O8
G = -411681.94 (J) H = -339355.61 (J) S = 57.26 (J/K) V = 9.41 (cc) Cp = 30.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.81 | 35.66 | 2.53 |

Total solids mass = 38.20 (gm) density = 2.87 (gm/cc)
G = -597814.52 (J) H = -488305.26 (J) S = 86.70 (J/K) V = 13.31 (cc) Cp = 45.79 (J/K)

Viscosity of the System: 7.05 (log 10 poise)

System mass = 99.95 (gm) density = 2.58 (gm/cc)
G = -1602499.20 (J) H = -1293307.16 (J) S = 244.78 (J/K) V = 38.69 (cc) Cp = 128.34 (J/K)

Oxygen delta moles = -0.00148764 delta grams = -0.0476026
G = 425.58 (J) H = -47.61 (J) S = -0.37 (J/K) V = -156.23 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 980.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.24 COH = 1.93 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 59.19 (gm) density = 2.43 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -962518.51 (J) H = -773136.49 (J) S = 151.12 (J/K) V = 24.37 (cc) Cp = 79.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.62 | 1.07 | 11.98 | 0.66 | 0.00 | 2.53 | 0.19 | 0.50 | 0.00 | 0.00 | 3.58 | 3.26 | 2.63 | 0.27 | 1.71 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.08 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.87Mg1.01Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -137948.37 (J) H = -110682.16 (J) S = 21.76 (J/K) V = 2.89 (cc) Cp = 11.67 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-87.33 93.86 87.28 3.42 -3.12 5.60 0.29

clinopyroxene mass = 3.96 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.87Mg0.86Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -53889.12 (J) H = -43138.33 (J) S = 8.58 (J/K) V = 1.14 (cc) Cp = 4.50 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-78.38 82.08 87.29 4.07 -3.34 7.23 1.04

feldspar mass = 26.32 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.62Ca0.35Al1.35Si2.65O8
G = -439121.52 (J) H = -362776.19 (J) S = 60.92 (J/K) V = 10.05 (cc) Cp = 32.17 (J/K)
albite anorthite sanidine
62.13 35.25 2.62

quartz mass = 0.39 (gm) density = 2.55 (gm/cc)
SiO2
G = -6524.23 (J) H = -5446.73 (J) S = 0.86 (J/K) V = 0.15 (cc) Cp = 0.46 (J/K)

Total solids mass = 40.76 (gm) density = 2.86 (gm/cc)
G = -637483.24 (J) H = -522043.41 (J) S = 92.12 (J/K) V = 14.24 (cc) Cp = 48.80 (J/K)

Viscosity of the System: 7.27 (log 10 poise)

System mass = 99.95 (gm) density = 2.59 (gm/cc)
G = -1600001.75 (J) H = -1295179.90 (J) S = 243.24 (J/K) V = 38.61 (cc) Cp = 127.83 (J/K)

Oxygen delta moles = -0.00159376 delta grams = -0.0509985
G = 451.93 (J) H = -50.44 (J) S = -0.40 (J/K) V = -166.06 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 970.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.24 COH = 1.91 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 55.49 (gm) density = 2.42 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -901671.62 (J) H = -725707.14 (J) S = 141.55 (J/K) V = 22.89 (cc) Cp = 74.08 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.58 1.14 11.92 0.64 0.00 2.41 0.20 0.47 0.00 0.00 3.54 3.22 2.77 0.29 1.82 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.77 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.89Mg0.99Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -133048.58 (J) H = -106975.10 (J) S = 20.97 (J/K) V = 2.80 (cc) Cp = 11.28 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-88.62 93.89 88.58 3.41 -3.09 5.55 0.28

clinopyroxene mass = 4.83 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.88Mg0.85Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -65424.98 (J) H = -52496.68 (J) S = 10.40 (J/K) V = 1.39 (cc) Cp = 5.46 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-78.34 81.32 88.00 4.06 -3.25 7.13 1.08

feldspar mass = 28.19 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.62Ca0.35Al1.35Si2.65O8
G = -469561.53 (J) H = -388782.76 (J) S = 64.98 (J/K) V = 10.77 (cc) Cp = 34.41 (J/K)
albite anorthite sanidine
62.32 34.90 2.78

quartz mass = 1.67 (gm) density = 2.55 (gm/cc)
SiO2
G = -27820.16 (J) H = -23275.95 (J) S = 3.66 (J/K) V = 0.65 (cc) Cp = 1.98 (J/K)

Total solids mass = 44.46 (gm) density = 2.85 (gm/cc)
G = -695855.24 (J) H = -571530.49 (J) S = 100.01 (J/K) V = 15.61 (cc) Cp = 53.14 (J/K)

Viscosity of the System: 7.56 (log 10 poise)

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1597526.87 (J) H = -1297237.63 (J) S = 241.56 (J/K) V = 38.49 (cc) Cp = 127.22 (J/K)

Oxygen delta moles = -0.00168862 delta grams = -0.0540338
G = 474.58 (J) H = -52.84 (J) S = -0.42 (J/K) V = -174.53 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 960.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.23 COH = 1.89 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 51.72 (gm) density = 2.42 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -840187.11 (J) H = -677578.58 (J) S = 131.86 (J/K) V = 21.40 (cc) Cp = 69.05 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.66 1.07 11.87 0.61 0.00 2.26 0.21 0.44 0.00 0.00 3.49 3.19 2.94 0.31 1.95 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.19 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.90Mg0.98Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -138171.43 (J) H = -111336.22 (J) S = 21.76 (J/K) V = 2.91 (cc) Cp = 11.74 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-89.67 93.88 89.73 3.37 -3.07 5.48 0.28

clinopyroxene mass = 4.63 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.19Fe"0.88Mg0.83Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -62543.31 (J) H = -50310.78 (J) S = 9.92 (J/K) V = 1.33 (cc) Cp = 5.23 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-77.69 80.32 88.42 3.98 -3.19 7.04 1.12

clinopyroxene mass = 0.18 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.77Fe"0.43Mg0.60Fe'"0.07Ti0.03Al0.19Si1.86O6
G = -2577.40 (J) H = -2115.69 (J) S = 0.37 (J/K) V = 0.05 (cc) Cp = 0.20 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
19.51 18.77 43.33 7.06 -0.77 7.66 4.45

feldspar mass = 30.04 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.62Ca0.35Al1.35Si2.65O8
G = -499578.93 (J) H = -414553.69 (J) S = 68.95 (J/K) V = 11.47 (cc) Cp = 36.63 (J/K)
albite anorthite sanidine
62.40 34.64 2.96

quartz mass = 3.02 (gm) density = 2.55 (gm/cc)
SiO2
G = -50292.54 (J) H = -42168.66 (J) S = 6.59 (J/K) V = 1.18 (cc) Cp = 3.58 (J/K)

rhm-oxide mass = 0.17 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.12Fe'"0.21Al0.10Ti0.84O3
G = -1741.26 (J) H = -1323.06 (J) S = 0.34 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.32 10.35 69.58 2.57 5.19

Total solids mass = 48.23 (gm) density = 2.84 (gm/cc)
G = -754904.87 (J) H = -621808.09 (J) S = 107.93 (J/K) V = 16.99 (cc) Cp = 57.53 (J/K)

Viscosity of the System: 8.00 (log 10 poise)

System mass = 99.94 (gm) density = 2.60 (gm/cc)
G = -1595091.99 (J) H = -1299386.67 (J) S = 239.80 (J/K) V = 38.38 (cc) Cp = 126.59 (J/K)

Oxygen delta moles = -0.00174098 delta grams = -0.0557094
G = 484.93 (J) H = -53.85 (J) S = -0.44 (J/K) V = -178.50 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 950.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.22 COH = 1.87 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 48.35 (gm) density = 2.41 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -784967.15 (J) H = -634259.33 (J) S = 123.21 (J/K) V = 20.05 (cc) Cp = 64.56 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.65 0.98 11.91 0.60 0.00 2.18 0.22 0.40 0.00 0.00 3.38 3.16 3.10 0.33 2.09 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.88 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.93Mg0.96Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -186705.05 (J) H = -150659.67 (J) S = 29.47 (J/K) V = 3.95 (cc) Cp = 15.93 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-92.91 94.15 92.58 3.43 -3.14 5.63 0.28

clinopyroxene mass = 1.54 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.44Mg0.58Fe'"0.07Ti0.03Al0.19Si1.86O6
G = -22327.79 (J) H = -18363.11 (J) S = 3.24 (J/K) V = 0.45 (cc) Cp = 1.72 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
18.62 18.35 44.42 6.97 -0.69 7.76 4.56

feldspar mass = 31.56 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -524102.37 (J) H = -435852.22 (J) S = 72.15 (J/K) V = 12.05 (cc) Cp = 38.45 (J/K)
albite anorthite sanidine
62.68 34.15 3.17

quartz mass = 4.30 (gm) density = 2.55 (gm/cc)
SiO2
G = -71387.80 (J) H = -59985.50 (J) S = 9.32 (J/K) V = 1.68 (cc) Cp = 5.08 (J/K)

rhm-oxide mass = 0.32 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.12Fe'"0.21Al0.10Ti0.84O3
G = -3206.75 (J) H = -2442.02 (J) S = 0.63 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.73 10.56 69.98 2.66 5.08

Total solids mass = 51.59 (gm) density = 2.83 (gm/cc)
G = -807729.75 (J) H = -667302.52 (J) S = 114.81 (J/K) V = 18.21 (cc) Cp = 61.48 (J/K)

Viscosity of the System: 8.75 (log 10 poise)

System mass = 99.94 (gm) density = 2.61 (gm/cc)
G = -1592696.91 (J) H = -1301561.84 (J) S = 238.02 (J/K) V = 38.27 (cc) Cp = 126.04 (J/K)

Oxygen delta moles = -0.00175227 delta grams = -0.0560706
G = 483.68 (J) H = -53.58 (J) S = -0.44 (J/K) V = -178.20 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 940.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.21 COH = 1.84 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 45.27 (gm) density = 2.40 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -734815.48 (J) H = -594929.15 (J) S = 115.31 (J/K) V = 18.83 (cc) Cp = 60.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.66 | 0.92 | 11.97 | 0.56 | 0.00 | 2.04 | 0.23 | 0.37 | 0.00 | 0.00 | 3.27 | 3.12 | 3.27 | 0.36 | 2.23 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.85 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.95Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -185607.65 (J) H = -150109.97 (J) S = 29.26 (J/K) V = 3.94 (cc) Cp = 15.87 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-94.14 94.34 93.62 3.45 -3.18 5.64 0.27

clinopyroxene mass = 2.03 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.78Fe"0.44Mg0.58Fe'"0.07Ti0.03Al0.19Si1.86O6
G = -29493.59 (J) H = -24317.66 (J) S = 4.27 (J/K) V = 0.60 (cc) Cp = 2.27 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
19.35 17.67 44.27 7.01 -0.64 7.68 4.66

feldspar mass = 32.92 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -545887.24 (J) H = -454956.15 (J) S = 74.95 (J/K) V = 12.57 (cc) Cp = 40.07 (J/K)
albite anorthite sanidine
62.98 33.63 3.39

quartz mass = 5.43 (gm) density = 2.55 (gm/cc)
SiO2
G = -90112.42 (J) H = -75882.32 (J) S = 11.73 (J/K) V = 2.13 (cc) Cp = 6.41 (J/K)

rhm-oxide mass = 0.44 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.12Fe'"0.21Al0.10Ti0.85O3
G = -4392.25 (J) H = -3354.84 (J) S = 0.86 (J/K) V = 0.10 (cc) Cp = 0.42 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.51 10.48 70.22 2.79 5.00

Total solids mass = 54.68 (gm) density = 2.83 (gm/cc)
G = -855493.14 (J) H = -708620.94 (J) S = 121.07 (J/K) V = 19.34 (cc) Cp = 65.04 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.62 (gm/cc)
G = -1590308.62 (J) H = -1303550.09 (J) S = 236.38 (J/K) V = 38.16 (cc) Cp = 125.50 (J/K)

Oxygen delta moles = -0.00178276 delta grams = -0.0570463
G = 487.63 (J) H = -53.87 (J) S = -0.45 (J/K) V = -179.82 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 42.50 (gm) density = 2.40 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -689801.85 (J) H = -559599.31 (J) S = 108.22 (J/K) V = 17.72 (cc) Cp = 56.77 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.65 0.85 12.03 0.53 0.00 1.90 0.24 0.34 0.00 0.00 3.17 3.08 3.44 0.38 2.38 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.83 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.94Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -184619.45 (J) H = -149651.74 (J) S = 29.06 (J/K) V = 3.93 (cc) Cp = 15.81 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-95.27 94.52 94.58 3.48 -3.22 5.64 0.27

clinopyroxene mass = 2.47 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.78Fe"0.44Mg0.57Fe'"0.07Ti0.03Al0.19Si1.86O6
G = -35811.46 (J) H = -29601.65 (J) S = 5.16 (J/K) V = 0.73 (cc) Cp = 2.76 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
20.12 17.01 44.08 7.06 -0.61 7.58 4.75

feldspar mass = 34.15 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.63Ca0.33Al1.33Si2.67O8
G = -565457.05 (J) H = -472290.65 (J) S = 77.44 (J/K) V = 13.05 (cc) Cp = 41.53 (J/K)
albite anorthite sanidine
63.26 33.15 3.60

quartz mass = 6.45 (gm) density = 2.55 (gm/cc)
SiO2
G = -106863.83 (J) H = -90181.58 (J) S = 13.87 (J/K) V = 2.53 (cc) Cp = 7.61 (J/K)

rhm-oxide mass = 0.54 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.21Al0.10Ti0.85O3
G = -5382.41 (J) H = -4123.63 (J) S = 1.05 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.32 10.40 70.45 2.92 4.92

Total solids mass = 57.44 (gm) density = 2.82 (gm/cc)
G = -898134.19 (J) H = -745849.25 (J) S = 126.57 (J/K) V = 20.35 (cc) Cp = 68.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1587936.04 (J) H = -1305448.56 (J) S = 234.79 (J/K) V = 38.07 (cc) Cp = 125.00 (J/K)

Oxygen delta moles = -0.00181413 delta grams = -0.0580501
G = 491.67 (J) H = -54.17 (J) S = -0.45 (J/K) V = -181.47 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 920.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.20 COH = 1.79 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 40.00 (gm) density = 2.39 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -649148.09 (J) H = -527662.28 (J) S = 101.82 (J/K) V = 16.73 (cc) Cp = 53.46 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.61 0.80 12.10 0.50 0.00 1.77 0.25 0.32 0.00 0.00 3.08 3.04 3.60 0.40 2.52 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.81 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.93Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -183712.81 (J) H = -149262.09 (J) S = 28.87 (J/K) V = 3.92 (cc) Cp = 15.76 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-96.31 94.71 95.46 3.52 -3.27 5.64 0.26

clinopyroxene mass = 2.86 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.79Fe"0.44Mg0.57Fe'"0.07Ti0.03Al0.19Si1.86O6
G = -41418.35 (J) H = -34323.43 (J) S = 5.95 (J/K) V = 0.84 (cc) Cp = 3.19 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
20.91 16.38 43.85 7.12 -0.58 7.48 4.84

feldspar mass = 35.27 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.64Ca0.33Al1.33Si2.67O8
G = -583135.43 (J) H = -488114.59 (J) S = 79.64 (J/K) V = 13.48 (cc) Cp = 42.85 (J/K)
albite anorthite sanidine
63.50 32.68 3.82

quartz mass = 7.37 (gm) density = 2.55 (gm/cc)
SiO2
G = -121950.86 (J) H = -103133.72 (J) S = 15.77 (J/K) V = 2.89 (cc) Cp = 8.69 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.21Al0.10Ti0.85O3
G = -6213.24 (J) H = -4774.78 (J) S = 1.21 (J/K) V = 0.14 (cc) Cp = 0.59 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.13 10.29 70.68 3.05 4.84

Total solids mass = 59.94 (gm) density = 2.82 (gm/cc)
G = -936430.69 (J) H = -779608.61 (J) S = 131.44 (J/K) V = 21.26 (cc) Cp = 71.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1585578.78 (J) H = -1307270.88 (J) S = 233.25 (J/K) V = 37.98 (cc) Cp = 124.55 (J/K)

Oxygen delta moles = -0.00184606 delta grams = -0.0590718
G = 495.71 (J) H = -54.47 (J) S = -0.46 (J/K) V = -183.13 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 910.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.19 COH = 1.77 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 37.74 (gm) density = 2.39 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -612221.81 (J) H = -498624.35 (J) S = 96.01 (J/K) V = 15.82 (cc) Cp = 50.45 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.55 0.74 12.17 0.47 0.00 1.64 0.27 0.30 0.00 0.00 3.00 2.99 3.76 0.43 2.68 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.79 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.93Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -182869.03 (J) H = -148925.40 (J) S = 28.69 (J/K) V = 3.91 (cc) Cp = 15.71 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-97.29 94.89 96.27 3.55 -3.32 5.64 0.26

clinopyroxene mass = 3.21 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.79Fe"0.44Mg0.57Fe'"0.07Ti0.03Al0.20Si1.86O6
G = -46423.08 (J) H = -38569.00 (J) S = 6.64 (J/K) V = 0.95 (cc) Cp = 3.58 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
21.71 15.77 43.58 7.19 -0.56 7.38 4.93

feldspar mass = 36.29 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.64Ca0.32Al1.32Si2.68O8
G = -599186.67 (J) H = -502639.34 (J) S = 81.60 (J/K) V = 13.87 (cc) Cp = 44.06 (J/K)
albite anorthite sanidine
63.73 32.24 4.04

quartz mass = 8.20 (gm) density = 2.55 (gm/cc)
SiO2
G = -135622.98 (J) H = -114941.09 (J) S = 17.48 (J/K) V = 3.22 (cc) Cp = 9.66 (J/K)

rhm-oxide mass = 0.70 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.20Al0.10Ti0.85O3
G = -6912.95 (J) H = -5328.95 (J) S = 1.34 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.97 10.18 70.92 3.18 4.76

Total solids mass = 62.20 (gm) density = 2.82 (gm/cc)
G = -971014.71 (J) H = -810403.79 (J) S = 135.75 (J/K) V = 22.09 (cc) Cp = 73.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1583236.52 (J) H = -1309028.14 (J) S = 231.76 (J/K) V = 37.90 (cc) Cp = 124.13 (J/K)

Oxygen delta moles = -0.00187831 delta grams = -0.0601037
G = 499.68 (J) H = -54.75 (J) S = -0.47 (J/K) V = -184.77 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 900.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.19 COH = 1.74 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 35.67 (gm) density = 2.38 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -578503.44 (J) H = -472079.92 (J) S = 90.72 (J/K) V = 14.99 (cc) Cp = 47.71 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.47 0.69 12.24 0.44 0.00 1.53 0.28 0.28 0.00 0.00 2.92 2.93 3.92 0.45 2.83 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.78 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.97Mg0.92Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -182075.57 (J) H = -148631.04 (J) S = 28.51 (J/K) V = 3.90 (cc) Cp = 15.67 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-98.20 95.07 97.02 3.59 -3.37 5.64 0.25

clinopyroxene mass = 3.53 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.43Mg0.56Fe'"0.07Ti0.03Al0.20Si1.86O6
G = -50913.16 (J) H = -42407.49 (J) S = 7.25 (J/K) V = 1.04 (cc) Cp = 3.92 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
22.53 15.18 43.28 7.27 -0.55 7.27 5.02

feldspar mass = 37.24 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.64Ca0.32Al1.32Si2.68O8
G = -613828.98 (J) H = -516039.44 (J) S = 83.36 (J/K) V = 14.23 (cc) Cp = 45.16 (J/K)
albite anorthite sanidine
63.93 31.81 4.26

quartz mass = 8.97 (gm) density = 2.55 (gm/cc)
SiO2
G = -148083.99 (J) H = -125769.06 (J) S = 19.02 (J/K) V = 3.52 (cc) Cp = 10.56 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.20Al0.09Ti0.85O3
G = -7503.83 (J) H = -5802.46 (J) S = 1.45 (J/K) V = 0.16 (cc) Cp = 0.72 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.81 10.05 71.15 3.30 4.70

Total solids mass = 64.27 (gm) density = 2.81 (gm/cc)
G = -1002405.54 (J) H = -838649.48 (J) S = 139.59 (J/K) V = 22.84 (cc) Cp = 76.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1580908.97 (J) H = -1310729.40 (J) S = 230.30 (J/K) V = 37.83 (cc) Cp = 123.74 (J/K)

Oxygen delta moles = -0.00191069 delta grams = -0.0611398
G = 503.53 (J) H = -55.02 (J) S = -0.48 (J/K) V = -186.37 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 890.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.18 COH = 1.72 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 33.78 (gm) density = 2.38 (gm/cc) viscosity = 6.10 (log 10 poise) (analysis in wt %)
G = -547561.84 (J) H = -447692.32 (J) S = 85.86 (J/K) V = 14.22 (cc) Cp = 45.20 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.37 0.65 12.32 0.42 0.00 1.42 0.29 0.27 0.00 0.00 2.85 2.88 4.07 0.48 2.99 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.76 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.98Mg0.92Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -181324.13 (J) H = -148371.85 (J) S = 28.33 (J/K) V = 3.89 (cc) Cp = 15.63 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-99.07 95.25 97.72 3.63 -3.42 5.64 0.25

clinopyroxene mass = 3.81 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.43Mg0.56Fe'"0.07Ti0.03Al0.20Si1.86O6
G = -54959.67 (J) H = -45894.95 (J) S = 7.79 (J/K) V = 1.12 (cc) Cp = 4.23 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
23.35 14.61 42.96 7.37 -0.54 7.16 5.10

feldspar mass = 38.11 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.64Ca0.31Al1.31Si2.69O8
G = -627244.50 (J) H = -528460.58 (J) S = 84.93 (J/K) V = 14.56 (cc) Cp = 46.18 (J/K)
albite anorthite sanidine
64.11 31.41 4.48

quartz mass = 9.67 (gm) density = 2.55 (gm/cc)
SiO2
G = -159502.06 (J) H = -135754.14 (J) S = 20.42 (J/K) V = 3.79 (cc) Cp = 11.37 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.20Al0.09Ti0.85O3
G = -8003.69 (J) H = -6208.34 (J) S = 1.54 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.65 9.92 71.38 3.42 4.63

Total solids mass = 66.16 (gm) density = 2.81 (gm/cc)
G = -1031034.06 (J) H = -864689.87 (J) S = 143.01 (J/K) V = 23.54 (cc) Cp = 78.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1578595.90 (J) H = -1312382.19 (J) S = 228.87 (J/K) V = 37.76 (cc) Cp = 123.38 (J/K)

Oxygen delta moles = -0.00194305 delta grams = -0.0621753
G = 507.22 (J) H = -55.26 (J) S = -0.48 (J/K) V = -187.91 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 880.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.17 COH = 1.69 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 32.03 (gm) density = 2.37 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -519035.84 (J) H = -425179.37 (J) S = 81.39 (J/K) V = 13.52 (cc) Cp = 42.89 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.25 0.60 12.41 0.39 0.00 1.31 0.30 0.25 0.00 0.00 2.78 2.82 4.23 0.50 3.15 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.75 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.91Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -180609.32 (J) H = -148143.13 (J) S = 28.15 (J/K) V = 3.88 (cc) Cp = 15.59 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-99.88 95.43 98.37 3.68 -3.47 5.64 0.24

clinopyroxene mass = 4.06 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.81Fe"0.43Mg0.56Fe'"0.07Ti0.03Al0.20Si1.86O6
G = -58620.94 (J) H = -49077.36 (J) S = 8.28 (J/K) V = 1.20 (cc) Cp = 4.51 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
24.17 14.06 42.62 7.47 -0.54 7.04 5.18

feldspar mass = 38.91 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.64Ca0.31Al1.31Si2.69O8
G = -639586.80 (J) H = -540025.62 (J) S = 86.34 (J/K) V = 14.87 (cc) Cp = 47.12 (J/K)
albite anorthite sanidine
64.26 31.03 4.71

quartz mass = 10.32 (gm) density = 2.55 (gm/cc)
SiO2
G = -170017.34 (J) H = -145010.19 (J) S = 21.69 (J/K) V = 4.05 (cc) Cp = 12.13 (J/K)

rhm-oxide mass = 0.86 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.11Fe'"0.20Al0.09Ti0.86O3
G = -8426.85 (J) H = -6557.10 (J) S = 1.62 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.51 9.78 71.61 3.53 4.57

Total solids mass = 67.91 (gm) density = 2.81 (gm/cc)
G = -1057261.25 (J) H = -888813.39 (J) S = 146.08 (J/K) V = 24.18 (cc) Cp = 80.15 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1576297.09 (J) H = -1313992.76 (J) S = 227.47 (J/K) V = 37.69 (cc) Cp = 123.04 (J/K)

Oxygen delta moles = -0.00197529 delta grams = -0.063207
G = 510.72 (J) H = -55.47 (J) S = -0.49 (J/K) V = -189.38 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 870.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.16 COH = 1.66 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 30.41 (gm) density = 2.37 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -492620.02 (J) H = -404302.33 (J) S = 77.26 (J/K) V = 12.86 (cc) Cp = 40.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.56 | 12.50 | 0.37 | 0.00 | 1.22 | 0.31 | 0.24 | 0.00 | 0.00 | 2.72 | 2.76 | 4.38 | 0.53 | 3.32 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.73 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.91Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -179927.76 (J) H = -147941.84 (J) S = 27.98 (J/K) V = 3.87 (cc) Cp = 15.55 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-100.66 95.60 98.98 3.73 -3.53 5.64 0.24

clinopyroxene mass = 4.30 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.81Fe"0.42Mg0.56Fe'"0.06Ti0.04Al0.20Si1.86O6
G = -61945.22 (J) H = -51992.70 (J) S = 8.71 (J/K) V = 1.27 (cc) Cp = 4.76 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
24.99 13.53 42.25 7.58 -0.55 6.93 5.25

feldspar mass = 39.67 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.64Ca0.31Al1.31Si2.69O8
G = -650986.69 (J) H = -550839.29 (J) S = 87.61 (J/K) V = 15.16 (cc) Cp = 47.99 (J/K)
albite anorthite sanidine
64.39 30.66 4.94

quartz mass = 10.93 (gm) density = 2.55 (gm/cc)
SiO2
G = -179747.74 (J) H = -153633.03 (J) S = 22.84 (J/K) V = 4.28 (cc) Cp = 12.83 (J/K)

rhm-oxide mass = 0.90 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.19Al0.09Ti0.86O3
G = -8784.93 (J) H = -6857.22 (J) S = 1.69 (J/K) V = 0.19 (cc) Cp = 0.84 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.37 9.64 71.85 3.64 4.51

Total solids mass = 69.52 (gm) density = 2.81 (gm/cc)
G = -1081392.35 (J) H = -911264.08 (J) S = 148.82 (J/K) V = 24.77 (cc) Cp = 81.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1574012.36 (J) H = -1315566.41 (J) S = 226.08 (J/K) V = 37.63 (cc) Cp = 122.72 (J/K)

Oxygen delta moles = -0.00200733 delta grams = -0.0642322
G = 514.02 (J) H = -55.66 (J) S = -0.50 (J/K) V = -190.79 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 860.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.64 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 28.91 (gm) density = 2.36 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -468053.76 (J) H = -384857.26 (J) S = 73.42 (J/K) V = 12.25 (cc) Cp = 38.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.93 | 0.52 | 12.59 | 0.35 | 0.00 | 1.12 | 0.33 | 0.22 | 0.00 | 0.00 | 2.66 | 2.69 | 4.53 | 0.56 | 3.49 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.72 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -179277.47 (J) H = -147766.13 (J) S = 27.81 (J/K) V = 3.86 (cc) Cp = 15.52 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.41 95.78 99.56 3.78 -3.60 5.65 0.23

clinopyroxene mass = 4.51 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.42Mg0.55Fe'"0.06Ti0.04Al0.20Si1.86O6
G = -64972.80 (J) H = -54672.65 (J) S = 9.09 (J/K) V = 1.33 (cc) Cp = 4.99 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
25.81 13.02 41.87 7.70 -0.56 6.82 5.33

feldspar mass = 40.37 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -661556.74 (J) H = -560991.79 (J) S = 88.75 (J/K) V = 15.43 (cc) Cp = 48.81 (J/K)
albite anorthite sanidine
64.51 30.31 5.18

quartz mass = 11.49 (gm) density = 2.55 (gm/cc)
SiO2
G = -188793.37 (J) H = -161704.12 (J) S = 23.91 (J/K) V = 4.51 (cc) Cp = 13.48 (J/K)

rhm-oxide mass = 0.93 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.19Al0.09Ti0.86O3
G = -9087.43 (J) H = -7115.67 (J) S = 1.74 (J/K) V = 0.20 (cc) Cp = 0.87 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.23 9.49 72.08 3.75 4.45

Total solids mass = 71.02 (gm) density = 2.80 (gm/cc)
G = -1103687.81 (J) H = -932250.36 (J) S = 151.29 (J/K) V = 25.32 (cc) Cp = 83.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.66 (gm/cc)
G = -1571741.57 (J) H = -1317107.62 (J) S = 224.71 (J/K) V = 37.57 (cc) Cp = 122.43 (J/K)

Oxygen delta moles = -0.00203911 delta grams = -0.065249
G = 517.10 (J) H = -55.82 (J) S = -0.51 (J/K) V = -192.11 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 850.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.61 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 27.51 (gm) density = 2.36 (gm/cc) viscosity = 6.03 (log 10 poise) (analysis in wt %)
G = -445112.55 (J) H = -366668.19 (J) S = 69.84 (J/K) V = 11.68 (cc) Cp = 36.91 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.74 0.49 12.69 0.32 0.00 1.04 0.34 0.21 0.00 0.00 2.61 2.63 4.67 0.59 3.67 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.71 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -178657.40 (J) H = -147615.00 (J) S = 27.64 (J/K) V = 3.86 (cc) Cp = 15.49 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.12 95.95 100.11 3.84 -3.66 5.66 0.23

clinopyroxene mass = 4.70 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.41Mg0.55Fe'"0.06Ti0.04Al0.20Si1.86O6
G = -67737.54 (J) H = -57143.83 (J) S = 9.43 (J/K) V = 1.38 (cc) Cp = 5.20 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
26.63 12.52 41.48 7.84 -0.57 6.70 5.41

feldspar mass = 41.03 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -671394.95 (J) H = -570561.73 (J) S = 89.78 (J/K) V = 15.68 (cc) Cp = 49.57 (J/K)
albite anorthite sanidine
64.60 29.98 5.43

quartz mass = 12.02 (gm) density = 2.55 (gm/cc)
SiO2
G = -197240.02 (J) H = -169293.34 (J) S = 24.88 (J/K) V = 4.71 (cc) Cp = 14.08 (J/K)

rhm-oxide mass = 0.96 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.19Al0.09Ti0.86O3
G = -9342.12 (J) H = -7338.12 (J) S = 1.78 (J/K) V = 0.21 (cc) Cp = 0.89 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.09 9.33 72.32 3.85 4.40

Total solids mass = 72.42 (gm) density = 2.80 (gm/cc)
G = -1124372.04 (J) H = -951952.03 (J) S = 153.51 (J/K) V = 25.84 (cc) Cp = 85.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.66 (gm/cc)
G = -1569484.58 (J) H = -1318620.23 (J) S = 223.36 (J/K) V = 37.52 (cc) Cp = 122.15 (J/K)

Oxygen delta moles = -0.00207058 delta grams = -0.066256
G = 519.95 (J) H = -55.95 (J) S = -0.51 (J/K) V = -193.35 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 840.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.14 COH = 1.58 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 26.20 (gm) density = 2.35 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -423600.99 (J) H = -349581.72 (J) S = 66.50 (J/K) V = 11.14 (cc) Cp = 35.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.53 | 0.45 | 12.79 | 0.30 | 0.00 | 0.96 | 0.35 | 0.20 | 0.00 | 0.00 | 2.57 | 2.56 | 4.81 | 0.62 | 3.86 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.70 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.01Mg0.90Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -178067.22 (J) H = -147488.06 (J) S = 27.47 (J/K) V = 3.85 (cc) Cp = 15.46 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.81 96.12 100.63 3.90 -3.73 5.67 0.22

clinopyroxene mass = 4.88 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.41Mg0.55Fe'"0.06Ti0.04Al0.20Si1.86O6
G = -70268.10 (J) H = -59428.73 (J) S = 9.74 (J/K) V = 1.44 (cc) Cp = 5.39 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
27.44 12.03 41.07 7.98 -0.59 6.58 5.48

feldspar mass = 41.66 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.30Al1.30Si2.70O8
G = -680587.59 (J) H = -579618.48 (J) S = 90.71 (J/K) V = 15.92 (cc) Cp = 50.29 (J/K)
albite anorthite sanidine
64.67 29.65 5.67

quartz mass = 12.52 (gm) density = 2.55 (gm/cc)
SiO2
G = -205161.96 (J) H = -176461.27 (J) S = 25.78 (J/K) V = 4.91 (cc) Cp = 14.65 (J/K)

rhm-oxide mass = 0.98 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.18Al0.09Ti0.86O3
G = -9555.43 (J) H = -7529.29 (J) S = 1.82 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.96 9.18 72.57 3.94 4.35

Total solids mass = 73.74 (gm) density = 2.80 (gm/cc)
G = -1143640.31 (J) H = -970525.84 (J) S = 155.52 (J/K) V = 26.33 (cc) Cp = 86.71 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.67 (gm/cc)
G = -1567241.29 (J) H = -1320107.56 (J) S = 222.01 (J/K) V = 37.46 (cc) Cp = 121.89 (J/K)

Oxygen delta moles = -0.00210172 delta grams = -0.0672524
G = 522.57 (J) H = -56.05 (J) S = -0.52 (J/K) V = -194.52 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 830.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.13 COH = 1.55 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 24.95 (gm) density = 2.35 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -403173.32 (J) H = -333315.83 (J) S = 63.33 (J/K) V = 10.63 (cc) Cp = 33.53 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.31 0.42 12.90 0.29 0.00 0.89 0.37 0.19 0.00 0.00 2.51 2.50 4.95 0.63 4.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.69 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.89Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -177521.43 (J) H = -147397.37 (J) S = 27.31 (J/K) V = 3.84 (cc) Cp = 15.43 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.48 96.28 101.13 3.97 -3.81 5.69 0.22

clinopyroxene mass = 5.04 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.41Mg0.55Fe'"0.06Ti0.04Al0.20Si1.86O6
G = -72562.33 (J) H = -61523.97 (J) S = 10.01 (J/K) V = 1.48 (cc) Cp = 5.56 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
28.24 11.56 40.65 8.14 -0.61 6.47 5.55

feldspar mass = 42.25 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -689228.99 (J) H = -588238.76 (J) S = 91.55 (J/K) V = 16.14 (cc) Cp = 50.98 (J/K)
albite anorthite sanidine
64.72 29.34 5.93

quartz mass = 12.99 (gm) density = 2.55 (gm/cc)
SiO2
G = -212657.28 (J) H = -183289.58 (J) S = 26.62 (J/K) V = 5.09 (cc) Cp = 15.19 (J/K)

rhm-oxide mass = 1.00 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.18Al0.09Ti0.87O3
G = -9734.78 (J) H = -7694.72 (J) S = 1.85 (J/K) V = 0.22 (cc) Cp = 0.93 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.83 9.02 72.81 4.03 4.30

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -133.39 (J) H = -112.64 (J) S = 0.02 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 74.99 (gm) density = 2.80 (gm/cc)
G = -1161838.20 (J) H = -988257.05 (J) S = 157.35 (J/K) V = 26.79 (cc) Cp = 88.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.67 (gm/cc)
G = -1565011.52 (J) H = -1321572.87 (J) S = 220.68 (J/K) V = 37.41 (cc) Cp = 121.63 (J/K)

Oxygen delta moles = -0.0021327 delta grams = -0.0682439
G = 525.00 (J) H = -56.12 (J) S = -0.53 (J/K) V = -195.61 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 820.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.12 COH = 1.52 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 23.77 (gm) density = 2.34 (gm/cc) viscosity = 5.95 (log 10 poise) (analysis in wt %)
G = -383928.73 (J) H = -317961.74 (J) S = 60.35 (J/K) V = 10.14 (cc) Cp = 31.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.07 | 0.39 | 13.01 | 0.27 | 0.00 | 0.82 | 0.38 | 0.18 | 0.00 | 0.00 | 2.46 | 2.43 | 5.09 | 0.65 | 4.25 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.69 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.89Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -177000.32 (J) H = -147326.48 (J) S = 27.15 (J/K) V = 3.84 (cc) Cp = 15.40 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-104.13 96.45 101.60 4.04 -3.88 5.72 0.21

clinopyroxene mass = 5.19 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.40Mg0.55Fe'"0.06Ti0.04Al0.20Si1.86O6
G = -74677.65 (J) H = -63476.76 (J) S = 10.25 (J/K) V = 1.53 (cc) Cp = 5.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.03 | 11.11 | 40.21 | 8.31 | -0.63 | 6.36 | 5.62 |

feldspar mass = 42.81 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -697361.62 (J) H = -596455.95 (J) S = 92.31 (J/K) V = 16.36 (cc) Cp = 51.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.75 | 29.05 | 6.20 |

quartz mass = 13.44 (gm) density = 2.55 (gm/cc)
SiO2
G = -219732.27 (J) H = -189781.33 (J) S = 27.40 (J/K) V = 5.27 (cc) Cp = 15.70 (J/K)

rhm-oxide mass = 1.02 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.18Al0.09Ti0.87O3
G = -9881.41 (J) H = -7835.14 (J) S = 1.87 (J/K) V = 0.22 (cc) Cp = 0.95 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.70 | 8.86 | 73.06 | 4.12 | 4.26 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -213.36 (J) H = -180.58 (J) S = 0.03 (J/K) V = 0.00 (cc) Cp = 0.02 (J/K)

Total solids mass = 76.16 (gm) density = 2.80 (gm/cc)
G = -1178866.62 (J) H = -1005056.24 (J) S = 159.00 (J/K) V = 27.22 (cc) Cp = 89.43 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.67 (gm/cc)
G = -1562795.35 (J) H = -1323017.98 (J) S = 219.35 (J/K) V = 37.36 (cc) Cp = 121.40 (J/K)

Oxygen delta moles = -0.00216323 delta grams = -0.0692207
G = 527.17 (J) H = -56.16 (J) S = -0.53 (J/K) V = -196.61 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 22.66 (gm) density = 2.34 (gm/cc) viscosity = 5.91 (log 10 poise) (analysis in wt %)
G = -365695.49 (J) H = -303381.95 (J) S = 57.53 (J/K) V = 9.68 (cc) Cp = 30.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.80 | 0.36 | 13.13 | 0.25 | 0.00 | 0.76 | 0.40 | 0.17 | 0.00 | 0.00 | 2.42 | 2.36 | 5.22 | 0.68 | 4.46 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.68 (gm) density = 3.57 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.02Mg0.89Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -176507.12 (J) H = -147278.04 (J) S = 26.99 (J/K) V = 3.83 (cc) Cp = 15.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.76 | 96.61 | 102.05 | 4.12 | -3.97 | 5.74 | 0.21 |

clinopyroxene mass = 5.32 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.40Mg0.55Fe'"0.06Ti0.04Al0.20Si1.86O6
G = -76628.30 (J) H = -65298.03 (J) S = 10.46 (J/K) V = 1.57 (cc) Cp = 5.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.81 | 10.66 | 39.77 | 8.49 | -0.66 | 6.24 | 5.69 |

feldspar mass = 43.34 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -705054.62 (J) H = -604326.39 (J) S = 93.00 (J/K) V = 16.56 (cc) Cp = 52.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.76 | 28.76 | 6.48 |

quartz mass = 13.87 (gm) density = 2.55 (gm/cc)
SiO2
G = -226446.61 (J) H = -195985.87 (J) S = 28.12 (J/K) V = 5.44 (cc) Cp = 16.18 (J/K)

rhm-oxide mass = 1.03 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.17Al0.08Ti0.87O3
G = -9999.41 (J) H = -7953.56 (J) S = 1.89 (J/K) V = 0.22 (cc) Cp = 0.96 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.57 | 8.70 | 73.32 | 4.20 | 4.22 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -261.16 (J) H = -221.54 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 77.27 (gm) density = 2.80 (gm/cc)
G = -1194897.21 (J) H = -1021063.43 (J) S = 160.49 (J/K) V = 27.63 (cc) Cp = 90.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.68 (gm/cc)
G = -1560592.71 (J) H = -1324445.38 (J) S = 218.02 (J/K) V = 37.32 (cc) Cp = 121.20 (J/K)

Oxygen delta moles = -0.00219332 delta grams = -0.0701838
G = 529.10 (J) H = -56.17 (J) S = -0.54 (J/K) V = -197.52 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 21.59 (gm) density = 2.34 (gm/cc) viscosity = 5.86 (log 10 poise) (analysis in wt %)
G = -348341.28 (J) H = -289470.86 (J) S = 54.86 (J/K) V = 9.25 (cc) Cp = 29.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

69.49 0.34 13.25 0.24 0.00 0.70 0.42 0.16 0.00 0.00 2.39 2.30 5.35 0.71 4.68 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.68 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.88Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -176043.13 (J) H = -147253.18 (J) S = 26.83 (J/K) V = 3.83 (cc) Cp = 15.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.38 | 96.77 | 102.49 | 4.20 | -4.06 | 5.78 | 0.20 |

clinopyroxene mass = 5.45 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.39Mg0.55Fe'"0.05Ti0.04Al0.21Si1.86O6
G = -78429.95 (J) H = -67000.05 (J) S = 10.65 (J/K) V = 1.61 (cc) Cp = 6.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.58 | 10.23 | 39.32 | 8.68 | -0.69 | 6.13 | 5.76 |

feldspar mass = 43.86 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -712370.35 (J) H = -611901.18 (J) S = 93.62 (J/K) V = 16.76 (cc) Cp = 52.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.75 | 28.48 | 6.76 |

quartz mass = 14.28 (gm) density = 2.55 (gm/cc)
SiO2
G = -232849.69 (J) H = -201944.02 (J) S = 28.80 (J/K) V = 5.60 (cc) Cp = 16.64 (J/K)

rhm-oxide mass = 1.04 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.17Al0.08Ti0.87O3
G = -10091.86 (J) H = -8052.20 (J) S = 1.90 (J/K) V = 0.22 (cc) Cp = 0.96 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.43 | 8.54 | 73.58 | 4.27 | 4.18 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -277.29 (J) H = -235.78 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 78.33 (gm) density = 2.80 (gm/cc)
G = -1210062.28 (J) H = -1036386.40 (J) S = 161.84 (J/K) V = 28.02 (cc) Cp = 91.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.68 (gm/cc)
G = -1558403.56 (J) H = -1325857.27 (J) S = 216.70 (J/K) V = 37.27 (cc) Cp = 121.01 (J/K)

Oxygen delta moles = -0.002223 delta grams = -0.0711334
G = 530.79 (J) H = -56.15 (J) S = -0.55 (J/K) V = -198.35 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 790.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = 0.09 COH = 1.43 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 20.58 (gm) density = 2.33 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -331742.32 (J) H = -276129.12 (J) S = 52.31 (J/K) V = 8.83 (cc) Cp = 27.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.15 | 0.31 | 13.37 | 0.22 | 0.00 | 0.65 | 0.43 | 0.15 | 0.00 | 0.00 | 2.37 | 2.23 | 5.47 | 0.75 | 4.91 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.68 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.88Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -175609.98 (J) H = -147253.31 (J) S = 26.67 (J/K) V = 3.83 (cc) Cp = 15.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.99 | 96.93 | 102.91 | 4.29 | -4.15 | 5.82 | 0.19 |

clinopyroxene mass = 5.57 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.39Mg0.55Fe'"0.05Ti0.04Al0.21Si1.86O6
G = -80096.15 (J) H = -68593.42 (J) S = 10.82 (J/K) V = 1.64 (cc) Cp = 6.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.33 | 9.80 | 38.85 | 8.89 | -0.72 | 6.02 | 5.82 |

feldspar mass = 44.36 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -719369.18 (J) H = -619230.14 (J) S = 94.19 (J/K) V = 16.95 (cc) Cp = 53.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.72 | 28.21 | 7.06 |

quartz mass = 14.68 (gm) density = 2.55 (gm/cc)
SiO2
G = -238987.55 (J) H = -207694.05 (J) S = 29.43 (J/K) V = 5.75 (cc) Cp = 17.08 (J/K)

rhm-oxide mass = 1.05 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.17Al0.08Ti0.87O3
G = -10161.23 (J) H = -8132.86 (J) S = 1.91 (J/K) V = 0.23 (cc) Cp = 0.97 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.30 | 8.37 | 73.85 | 4.34 | 4.14 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -261.47 (J) H = -222.83 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 79.35 (gm) density = 2.79 (gm/cc)
G = -1224485.55 (J) H = -1051126.61 (J) S = 163.06 (J/K) V = 28.40 (cc) Cp = 93.06 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.68 (gm/cc)
G = -1556227.88 (J) H = -1327255.73 (J) S = 215.37 (J/K) V = 37.22 (cc) Cp = 120.85 (J/K)

Oxygen delta moles = -0.00225227 delta grams = -0.07207
G = 532.24 (J) H = -56.10 (J) S = -0.55 (J/K) V = -199.09 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 780.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = 0.08 COH = 1.40 IW

= 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 19.44 (gm) density = 2.33 (gm/cc) viscosity = 5.72 (log 10 poise) (analysis in wt %)
G = -313308.32 (J) H = -261148.81 (J) S = 49.53 (J/K) V = 8.36 (cc) Cp = 26.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.76 | 0.28 | 13.47 | 0.21 | 0.00 | 0.60 | 0.46 | 0.14 | 0.00 | 0.00 | 2.37 | 2.19 | 5.52 | 0.79 | 5.19 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.68 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.88Fe"'0.02Ti0.00Al0.10Si1.94O6
G = -175291.82 (J) H = -147350.33 (J) S = 26.53 (J/K) V = 3.82 (cc) Cp = 15.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.57 | 97.09 | 103.29 | 4.39 | -4.25 | 5.87 | 0.19 |

clinopyroxene mass = 5.66 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.38Mg0.55Fe"'0.05Ti0.04Al0.21Si1.86O6
G = -81445.87 (J) H = -69922.20 (J) S = 10.94 (J/K) V = 1.67 (cc) Cp = 6.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.06 | 9.38 | 38.36 | 9.14 | -0.75 | 5.91 | 5.89 |

feldspar mass = 44.66 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -723366.42 (J) H = -624010.64 (J) S = 94.34 (J/K) V = 17.06 (cc) Cp = 53.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.71 | 28.09 | 7.21 |

feldspar mass = 0.29 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.02Al1.02Si2.98O8
G = -4598.85 (J) H = -3955.96 (J) S = 0.61 (J/K) V = 0.12 (cc) Cp = 0.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.93 | 1.89 | 71.19 |

quartz mass = 15.10 (gm) density = 2.55 (gm/cc)
SiO2
G = -245584.57 (J) H = -213865.32 (J) S = 30.12 (J/K) V = 5.92 (cc) Cp = 17.55 (J/K)

rhm-oxide mass = 1.06 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe"'0.16Al0.08Ti0.88O3
G = -10228.99 (J) H = -8212.67 (J) S = 1.91 (J/K) V = 0.23 (cc) Cp = 0.98 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.17 | 8.20 | 74.12 | 4.39 | 4.11 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -240.79 (J) H = -205.68 (J) S = 0.03 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 80.48 (gm) density = 2.79 (gm/cc)
G = -1240757.32 (J) H = -1067522.80 (J) S = 164.49 (J/K) V = 28.82 (cc) Cp = 94.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1554065.64 (J) H = -1328671.61 (J) S = 214.02 (J/K) V = 37.18 (cc) Cp = 120.70 (J/K)

Oxygen delta moles = -0.00228128 delta grams = -0.0729981
G = 533.49 (J) H = -56.02 (J) S = -0.56 (J/K) V = -199.75 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 770.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = 0.07 COH = 1.37 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 17.75 (gm) density = 2.32 (gm/cc) viscosity = 5.47 (log 10 poise) (analysis in wt %)
G = -286044.31 (J) H = -238484.33 (J) S = 45.59 (J/K) V = 7.66 (cc) Cp = 24.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.26 | 0.25 | 13.33 | 0.21 | 0.00 | 0.60 | 0.56 | 0.14 | 0.00 | 0.00 | 2.43 | 2.35 | 5.32 | 0.87 | 5.69 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.39 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.87Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -183635.33 (J) H = -154710.25 (J) S = 27.73 (J/K) V = 4.02 (cc) Cp = 16.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.72 | 97.24 | 104.30 | 4.41 | -4.29 | 5.87 | 0.19 |

clinopyroxene mass = 3.86 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.38Mg0.55Fe'"0.05Ti0.04Al0.21Si1.86O6
G = -55450.83 (J) H = -47713.43 (J) S = 7.42 (J/K) V = 1.14 (cc) Cp = 4.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.39 | 9.08 | 38.38 | 9.02 | -0.68 | 5.76 | 6.05 |

clinopyroxene mass = 2.27 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.30Mg0.29Fe'"0.05Ti0.40Al0.75Si1.23O6
G = -32600.48 (J) H = -28179.00 (J) S = 4.24 (J/K) V = 0.63 (cc) Cp = 2.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.96 | 1.58 | 29.87 | 71.79 | 7.23 | -1.79 | 5.28 |

feldspar mass = 43.72 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -707229.71 (J) H = -611386.12 (J) S = 91.88 (J/K) V = 16.70 (cc) Cp = 52.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.44 | 27.52 | 7.03 |

feldspar mass = 1.55 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.02Al1.02Si2.98O8
G = -24266.55 (J) H = -20920.35 (J) S = 3.21 (J/K) V = 0.61 (cc) Cp = 1.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.66 | 1.76 | 71.58 |

quartz mass = 15.86 (gm) density = 2.55 (gm/cc)
SiO2
G = -257554.37 (J) H = -224747.91 (J) S = 31.45 (J/K) V = 6.22 (cc) Cp = 18.40 (J/K)

rhm-oxide mass = 0.50 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.09Fe'''0.16Al0.08Ti0.88O3
G = -4814.44 (J) H = -3876.41 (J) S = 0.90 (J/K) V = 0.11 (cc) Cp = 0.46 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.96 | 8.16 | 74.07 | 4.79 | 4.02 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -266.98 (J) H = -228.57 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 82.17 (gm) density = 2.79 (gm/cc)
G = -1265818.68 (J) H = -1091762.04 (J) S = 166.86 (J/K) V = 29.43 (cc) Cp = 96.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.69 (gm/cc)
G = -1551862.99 (J) H = -1330246.37 (J) S = 212.45 (J/K) V = 37.09 (cc) Cp = 120.51 (J/K)

Oxygen delta moles = -0.00241553 delta grams = -0.0772939
G = 558.96 (J) H = -58.47 (J) S = -0.59 (J/K) V = -209.50 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 760.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = 0.07 COH = 1.34 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 16.12 (gm) density = 2.31 (gm/cc) viscosity = 5.18 (log 10 poise) (analysis in wt %)
G = -259762.54 (J) H = -216558.88 (J) S = 41.82 (J/K) V = 6.99 (cc) Cp = 22.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.62 | 0.21 | 13.19 | 0.22 | 0.00 | 0.59 | 0.69 | 0.13 | 0.00 | 0.00 | 2.51 | 2.54 | 5.09 | 0.96 | 6.26 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 15.01 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.86Fe'''0.02Ti0.00Al0.10Si1.94O6
G = -190886.34 (J) H = -161187.35 (J) S = 28.75 (J/K) V = 4.18 (cc) Cp = 16.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.72 | 97.38 | 105.18 | 4.43 | -4.32 | 5.86 | 0.18 |

clinopyroxene mass = 2.29 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.38Mg0.55Fe'''0.05Ti0.04Al0.21Si1.86O6
G = -32807.03 (J) H = -28294.02 (J) S = 4.37 (J/K) V = 0.67 (cc) Cp = 2.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.89 | 8.84 | 38.35 | 8.77 | -0.69 | 5.65 | 6.20 |

clinopyroxene mass = 4.27 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.30Mg0.28Fe'''0.05Ti0.40Al0.76Si1.22O6
G = -61282.40 (J) H = -53089.66 (J) S = 7.93 (J/K) V = 1.19 (cc) Cp = 4.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.42 | 1.49 | 29.97 | 72.34 | 7.23 | -1.98 | 5.36 |

feldspar mass = 42.88 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.66Ca0.27Al1.27Si2.73O8
G = -692803.90 (J) H = -600189.36 (J) S = 89.64 (J/K) V = 16.38 (cc) Cp = 52.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.14 | 27.01 | 6.85 |

feldspar mass = 2.74 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.26Ca0.02Al1.02Si2.98O8
G = -42778.76 (J) H = -36961.19 (J) S = 5.63 (J/K) V = 1.08 (cc) Cp = 3.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.34 | 1.64 | 72.02 |

quartz mass = 16.59 (gm) density = 2.55 (gm/cc)
SiO2
G = -269129.87 (J) H = -235327.70 (J) S = 32.72 (J/K) V = 6.50 (cc) Cp = 19.23 (J/K)

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -229.41 (J) H = -196.85 (J) S = 0.03 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 83.80 (gm) density = 2.79 (gm/cc)
G = -1289917.71 (J) H = -1115246.12 (J) S = 169.07 (J/K) V = 30.02 (cc) Cp = 98.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.70 (gm/cc)
G = -1549680.25 (J) H = -1331805.00 (J) S = 210.88 (J/K) V = 37.01 (cc) Cp = 120.37 (J/K)

Oxygen delta moles = -0.00254256 delta grams = -0.0813589
G = 582.13 (J) H = -60.66 (J) S = -0.62 (J/K) V = -218.40 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 750.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = 0.06 COH = 1.30 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 14.57 (gm) density = 2.30 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -234901.34 (J) H = -195783.72 (J) S = 38.23 (J/K) V = 6.35 (cc) Cp = 20.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.83 | 0.17 | 13.12 | 0.21 | 0.00 | 0.57 | 0.76 | 0.13 | 0.00 | 0.00 | 2.62 | 2.71 | 4.86 | 1.08 | 6.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.76 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.62Mg0.20)3Al2Si3O12
G = -10035.85 (J) H = -8605.35 (J) S = 1.40 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.63 | 18.54 | 19.83 |

orthopyroxene mass = 14.49 (gm) density = 3.59 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.05Mg0.87Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -184284.05 (J) H = -156049.77 (J) S = 27.60 (J/K) V = 4.04 (cc) Cp = 16.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.11 | 97.49 | 104.56 | 4.44 | -4.33 | 5.78 | 0.18 |

clinopyroxene mass = 2.40 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.37Mg0.56Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -34568.30 (J) H = -29892.43 (J) S = 4.57 (J/K) V = 0.71 (cc) Cp = 2.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.64 | 8.54 | 37.32 | 8.56 | -0.83 | 5.50 | 6.27 |

clinopyroxene mass = 4.29 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.30Mg0.29Fe'"0.05Ti0.40Al0.76Si1.22O6
G = -61562.79 (J) H = -53463.30 (J) S = 7.92 (J/K) V = 1.20 (cc) Cp = 4.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.45 | 1.40 | 29.52 | 73.21 | 7.11 | -2.17 | 5.39 |

feldspar mass = 42.33 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.67Ca0.27Al1.27Si2.73O8
G = -683109.45 (J) H = -593065.19 (J) S = 88.01 (J/K) V = 16.17 (cc) Cp = 51.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.63 | 26.76 | 6.61 |

feldspar mass = 3.81 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.73Na0.26Ca0.02Al1.02Si2.98O8
G = -59376.70 (J) H = -51415.15 (J) S = 7.78 (J/K) V = 1.50 (cc) Cp = 4.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 25.86 | 1.53 | 72.61 |

quartz mass = 17.25 (gm) density = 2.55 (gm/cc)
SiO2
G = -279577.05 (J) H = -244959.33 (J) S = 33.83 (J/K) V = 6.76 (cc) Cp = 19.98 (J/K)

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -137.68 (J) H = -118.40 (J) S = 0.02 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 85.35 (gm) density = 2.79 (gm/cc)
G = -1312651.85 (J) H = -1137568.92 (J) S = 171.12 (J/K) V = 30.58 (cc) Cp = 100.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.71 (gm/cc)
G = -1547553.20 (J) H = -1333352.63 (J) S = 209.35 (J/K) V = 36.92 (cc) Cp = 120.29 (J/K)

Oxygen delta moles = -0.0025918 delta grams = -0.0829346
G = 587.07 (J) H = -60.93 (J) S = -0.63 (J/K) V = -220.48 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 740.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = 0.05 COH = 1.27 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 11.46 (gm) density = 2.28 (gm/cc) viscosity = 4.31 (log 10 poise) (analysis in wt %)
G = -184728.91 (J) H = -153578.97 (J) S = 30.75 (J/K) V = 5.03 (cc) Cp = 15.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.70 | 0.14 | 12.41 | 0.25 | 0.00 | 0.64 | 0.97 | 0.11 | 0.00 | 0.00 | 2.82 | 3.34 | 4.35 | 1.28 | 7.99 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.76 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.63Mg0.18)3Al2Si3O12
G = -62518.47 (J) H = -53702.73 (J) S = 8.70 (J/K) V = 1.20 (cc) Cp = 5.03 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.14 | 18.58 | 18.28 |

orthopyroxene mass = 9.92 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.83Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -124601.03 (J) H = -105614.61 (J) S = 18.74 (J/K) V = 2.75 (cc) Cp = 10.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.86 | 97.67 | 109.18 | 4.30 | -4.21 | 5.73 | 0.18 |

clinopyroxene mass = 2.85 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.85Fe"0.40Mg0.53Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -40683.04 (J) H = -35224.45 (J) S = 5.39 (J/K) V = 0.84 (cc) Cp = 3.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.83 | 8.40 | 39.90 | 8.05 | -0.12 | 5.18 | 6.77 |

clinopyroxene mass = 4.33 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.31Mg0.27Fe'"0.05Ti0.40Al0.76Si1.22O6
G = -61859.93 (J) H = -53805.82 (J) S = 7.95 (J/K) V = 1.21 (cc) Cp = 4.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.84 | 1.33 | 31.12 | 72.38 | 7.74 | -2.61 | 5.87 |

biotite mass = 2.20 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -34232.69 (J) H = -29485.54 (J) S = 4.69 (J/K) V = 0.79 (cc) Cp = 2.74 (J/K)

| annite | phlogopite |
|---|---|
| 9.10 | 90.90 |

feldspar mass = 41.02 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.69Ca0.24Al1.24Si2.76O8
G = -660861.41 (J) H = -574851.55 (J) S = 84.89 (J/K) V = 15.69 (cc) Cp = 50.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.86 | 24.31 | 6.83 |

feldspar mass = 3.56 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -55329.30 (J) H = -48013.45 (J) S = 7.22 (J/K) V = 1.40 (cc) Cp = 4.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.62 | 1.39 | 71.99 |

quartz mass = 19.78 (gm) density = 2.55 (gm/cc)
SiO2
G = -320117.51 (J) H = -281047.73 (J) S = 38.56 (J/K) V = 7.75 (cc) Cp = 22.87 (J/K)

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -526.35 (J) H = -453.69 (J) S = 0.07 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 88.46 (gm) density = 2.80 (gm/cc)
G = -1360729.73 (J) H = -1182199.58 (J) S = 176.21 (J/K) V = 31.64 (cc) Cp = 103.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.72 (gm/cc)
G = -1545458.64 (J) H = -1335778.55 (J) S = 206.96 (J/K) V = 36.67 (cc) Cp = 119.87 (J/K)

Oxygen delta moles = -0.00261699 delta grams = -0.0837406
G = 586.38 (J) H = -60.61 (J) S = -0.64 (J/K) V = -220.45 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 730.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = 0.04 COH = 1.24 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 8.31 (gm) density = 2.25 (gm/cc) viscosity = 3.65 (log 10 poise) (analysis in wt %)
G = -134245.76 (J) H = -111168.33 (J) S = 23.00 (J/K) V = 3.70 (cc) Cp = 11.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.05 | 0.10 | 11.62 | 0.30 | 0.00 | 0.73 | 1.02 | 0.10 | 0.00 | 0.00 | 3.11 | 4.16 | 3.78 | 1.56 | 9.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.67 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.65Mg0.17)3Al2Si3O12
G = -139382.73 (J) H = -119946.65 (J) S = 19.38 (J/K) V = 2.68 (cc) Cp = 11.25 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.57 | 18.63 | 16.80 |

orthopyroxene mass = 1.95 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.78Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -24121.65 (J) H = -20466.42 (J) S = 3.64 (J/K) V = 0.54 (cc) Cp = 2.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.53 | 97.82 | 113.80 | 4.13 | -4.05 | 5.66 | 0.18 |

clinopyroxene mass = 7.06 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.43Mg0.50Fe'"0.05Ti0.04Al0.19Si1.87O6
G = -99770.34 (J) H = -86488.83 (J) S = 13.24 (J/K) V = 2.07 (cc) Cp = 7.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.01 | 8.41 | 42.73 | 7.17 | 0.45 | 4.98 | 7.24 |

biotite mass = 5.26 (gm) density = 2.81 (gm/cc) (analysis in mole %)
K(Fe"0.12Mg0.88)3AlSi3O10(OH)2
G = -80682.29 (J) H = -69558.54 (J) S = 11.09 (J/K) V = 1.87 (cc) Cp = 6.51 (J/K)

| annite | phlogopite |
|---|---|
| 12.01 | 87.99 |

feldspar mass = 40.61 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -653260.67 (J) H = -569353.64 (J) S = 83.64 (J/K) V = 15.56 (cc) Cp = 50.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.86 | 22.13 | 7.01 |

feldspar mass = 2.30 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -35662.56 (J) H = -31013.76 (J) S = 4.63 (J/K) V = 0.91 (cc) Cp = 2.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.24 | 1.26 | 71.50 |

quartz mass = 22.55 (gm) density = 2.55 (gm/cc)
SiO2
G = -364522.86 (J) H = -320678.91 (J) S = 43.71 (J/K) V = 8.84 (cc) Cp = 26.04 (J/K)

rhm-oxide mass = 1.15 (gm) density = 4.69 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.07Fe"'0.17Al0.07Ti0.88O3
G = -10773.93 (J) H = -8762.53 (J) S = 2.01 (J/K) V = 0.24 (cc) Cp = 1.04 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.20 | 8.40 | 76.32 | 4.75 | 3.33 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1087.75 (J) H = -939.70 (J) S = 0.15 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 91.61 (gm) density = 2.80 (gm/cc)
G = -1409264.79 (J) H = -1227208.98 (J) S = 181.48 (J/K) V = 32.72 (cc) Cp = 107.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.74 (gm/cc)
G = -1543510.55 (J) H = -1338377.31 (J) S = 204.49 (J/K) V = 36.42 (cc) Cp = 119.51 (J/K)

Oxygen delta moles = -0.00240919 delta grams = -0.0770912
G = 533.95 (J) H = -54.95 (J) S = -0.59 (J/K) V = -200.94 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 720.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = 0.02 COH = 1.20 IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 6.14 (gm) density = 2.21 (gm/cc) viscosity = 2.66 (log 10 poise) (analysis in wt %)
G = -99375.34 (J) H = -81643.87 (J) S = 17.85 (J/K) V = 2.78 (cc) Cp = 8.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.19 | 0.07 | 10.85 | 0.36 | 0.00 | 0.82 | 1.40 | 0.09 | 0.00 | 0.00 | 3.87 | 5.10 | 3.03 | 2.22 | 12.01 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.20 (gm) density = 4.00 (gm/cc) (analysis in mole %)

(Ca0.19Fe"0.65Mg0.16)3Al2Si3O12
G = -158673.96 (J) H = -136833.42 (J) S = 21.99 (J/K) V = 3.05 (cc) Cp = 12.82 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.35 | 19.00 | 15.65 |

clinopyroxene mass = 7.15 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.44Mg0.48Fe'"0.06Ti0.04Al0.19Si1.87O6
G = -100516.99 (J) H = -87287.40 (J) S = 13.32 (J/K) V = 2.09 (cc) Cp = 7.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.68 | 7.95 | 44.14 | 6.99 | 0.86 | 4.79 | 7.59 |

biotite mass = 6.50 (gm) density = 2.82 (gm/cc) (analysis in mole %)
K(Fe"0.15Mg0.85)3AlSi3O10(OH)2
G = -98692.45 (J) H = -85183.17 (J) S = 13.60 (J/K) V = 2.30 (cc) Cp = 8.01 (J/K)

| annite | phlogopite |
|---|---|
| 14.51 | 85.49 |

feldspar mass = 40.33 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.72Ca0.21Al1.21Si2.79O8
G = -647925.34 (J) H = -565885.49 (J) S = 82.61 (J/K) V = 15.45 (cc) Cp = 50.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.92 | 21.16 | 6.92 |

feldspar mass = 2.33 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -36081.01 (J) H = -31446.06 (J) S = 4.67 (J/K) V = 0.92 (cc) Cp = 2.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.11 | 1.15 | 71.74 |

quartz mass = 24.07 (gm) density = 2.55 (gm/cc)
SiO2
G = -388607.87 (J) H = -342553.96 (J) S = 46.37 (J/K) V = 9.44 (cc) Cp = 27.76 (J/K)

rhm-oxide mass = 1.15 (gm) density = 4.70 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.77Mg0.07Fe'"0.17Al0.06Ti0.88O3
G = -10723.34 (J) H = -8744.05 (J) S = 1.99 (J/K) V = 0.24 (cc) Cp = 1.04 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.69 | 8.36 | 77.16 | 4.63 | 3.16 |

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -868.02 (J) H = -751.56 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

Total solids mass = 93.78 (gm) density = 2.80 (gm/cc)
G = -1442088.99 (J) H = -1258685.11 (J) S = 184.67 (J/K) V = 33.51 (cc) Cp = 110.84 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.75 (gm/cc)
G = -1541464.33 (J) H = -1340328.98 (J) S = 202.52 (J/K) V = 36.30 (cc) Cp = 119.72 (J/K)

Oxygen delta moles = -0.0024318 delta grams = -0.0778146
G = 533.04 (J) H = -54.62 (J) S = -0.59 (J/K) V = -200.80 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 710.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -16.00  delta HM = -5.22  NNO = 0.00  QFM = 0.01  COH = 1.16  IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid  mass = 3.71 (gm)  density = 2.12 (gm/cc)  viscosity = 0.89 (log 10 poise)  (analysis in wt %)
G = -60247.04 (J)  H = -48511.38 (J)  S = 11.94 (J/K)  V = 1.75 (cc)  Cp = 5.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49.48 | 0.03 | 9.32 | 0.47 | 0.00 | 0.98 | 2.62 | 0.07 | 0.00 | 0.00 | 6.31 | 6.60 | 1.85 | 4.36 | 17.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 12.42 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.19Fe"0.66Mg0.15)3Al2Si3O12
G = -160859.30 (J)  H = -139017.93 (J)  S = 22.22 (J/K)  V = 3.10 (cc)  Cp = 13.01 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.93 | 19.39 | 14.67 |

clinopyroxene  mass = 5.65 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.85Fe"0.45Mg0.46Fe'"0.06Ti0.04Al0.19Si1.87O6
G = -79098.23 (J)  H = -68816.92 (J)  S = 10.46 (J/K)  V = 1.65 (cc)  Cp = 6.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.75 | 7.44 | 45.15 | 6.96 | 1.25 | 4.56 | 7.89 |

clinopyroxene  mass = 1.90 (gm)  density = 3.61 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.35Mg0.23Fe'"0.05Ti0.40Al0.75Si1.23O6
G = -26862.46 (J)  H = -23491.96 (J)  S = 3.43 (J/K)  V = 0.53 (cc)  Cp = 2.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -19.09 | 1.07 | 34.53 | 71.44 | 8.80 | -3.56 | 6.81 |

biotite  mass = 7.18 (gm)  density = 2.84 (gm/cc)  (analysis in mole %)
K(Fe"0.17Mg0.83)3AlSi3O10(OH)2
G = -107922.01 (J)  H = -93256.02 (J)  S = 14.92 (J/K)  V = 2.53 (cc)  Cp = 8.81 (J/K)

| annite | phlogopite |
|---|---|
| 17.06 | 82.94 |

feldspar  mass = 39.39 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.07Na0.73Ca0.20Al1.20Si2.80O8
G = -632104.80 (J)  H = -553240.25 (J)  S = 80.22 (J/K)  V = 15.10 (cc)  Cp = 50.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.81 | 20.41 | 6.78 |

feldspar  mass = 2.86 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -44290.95 (J)  H = -38685.61 (J)  S = 5.70 (J/K)  V = 1.13 (cc)  Cp = 3.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.83 | 1.05 | 72.12 |

quartz  mass = 25.55 (gm)  density = 2.55 (gm/cc)
SiO2
G = -412101.64 (J)  H = -363990.64 (J)  S = 48.94 (J/K)  V = 10.02 (cc)  Cp = 29.43 (J/K)

leucite mass = 0.60 (gm) density = 2.27 (gm/cc) (analysis in mole %)
K0.00Na1.00AlSi2O5.07(OH)1.87
G = -9894.68 (J) H = -8412.43 (J) S = 1.51 (J/K) V = 0.27 (cc) Cp = 0.93 (J/K)

| leucite | analcime | na-leucite |
|---|---|---|
| 0.48 | 93.38 | 6.14 |

rhm-oxide mass = 0.64 (gm) density = 4.70 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.78Mg0.06Fe'"0.16Al0.06Ti0.89O3
G = -5997.19 (J) H = -4903.82 (J) S = 1.11 (J/K) V = 0.14 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 6.27 | 8.23 | 77.97 | 4.50 | 3.02 |

Total solids mass = 96.21 (gm) density = 2.79 (gm/cc)
G = -1479131.26 (J) H = -1293815.58 (J) S = 188.49 (J/K) V = 34.46 (cc) Cp = 114.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.76 (gm/cc)
G = -1539378.30 (J) H = -1342326.96 (J) S = 200.43 (J/K) V = 36.21 (cc) Cp = 120.30 (J/K)

Oxygen delta moles = -0.00256813 delta grams = -0.082177
G = 556.68 (J) H = -56.79 (J) S = -0.62 (J/K) V = -209.92 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 700.00 (C) P = 5.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = 0.00 COH = 1.13 IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 1.34 (gm) density = 2.17 (gm/cc) viscosity = -0.73 (log 10 poise) (analysis in wt %)
G = -20857.00 (J) H = -16670.75 (J) S = 4.30 (J/K) V = 0.61 (cc) Cp = 2.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30.35 | 0.02 | 6.20 | 0.43 | 0.00 | 0.75 | 8.32 | 0.06 | 0.00 | 0.00 | 15.27 | 4.81 | 0.95 | 12.10 | 20.74 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.23 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.20Fe"0.66Mg0.14)3Al2Si3O12
G = -171143.02 (J) H = -148251.94 (J) S = 23.52 (J/K) V = 3.31 (cc) Cp = 13.83 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.99 | 19.86 | 14.14 |

clinopyroxene mass = 4.40 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.85Fe"0.45Mg0.46Fe'"0.06Ti0.04Al0.19Si1.88O6
G = -61552.04 (J) H = -53680.17 (J) S = 8.09 (J/K) V = 1.28 (cc) Cp = 4.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.78 | 6.94 | 44.79 | 6.79 | 1.22 | 4.43 | 8.04 |

clinopyroxene mass = 4.28 (gm) density = 3.61 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.35Mg0.23Fe'"0.05Ti0.40Al0.75Si1.23O6
G = -60361.08 (J) H = -52905.93 (J) S = 7.66 (J/K) V = 1.19 (cc) Cp = 4.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -19.47 | 0.97 | 34.59 | 72.04 | 8.74 | -3.75 | 6.87 |

biotite mass = 7.22 (gm) density = 2.84 (gm/cc) (analysis in mole %)
K(Fe"0.17Mg0.83)3AlSi3O10(OH)2
G = -108345.35 (J) H = -93838.80 (J) S = 14.91 (J/K) V = 2.55 (cc) Cp = 8.84 (J/K)

| annite | phlogopite |
|---|---|
| 17.08 | 82.92 |

feldspar mass = 32.45 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.73Ca0.20Al1.20Si2.80O8
G = -520064.32 (J) H = -456170.40 (J) S = 65.66 (J/K) V = 12.43 (cc) Cp = 42.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.34 | 20.13 | 6.53 |

feldspar mass = 3.99 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.73Na0.26Ca0.01Al1.01Si2.99O8
G = -61688.70 (J) H = -53999.67 (J) S = 7.90 (J/K) V = 1.57 (cc) Cp = 4.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.25 | 0.97 | 72.78 |

quartz mass = 27.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -441028.74 (J) H = -390317.41 (J) S = 52.11 (J/K) V = 10.73 (cc) Cp = 31.49 (J/K)

leucite mass = 5.62 (gm) density = 2.27 (gm/cc) (analysis in mole %)
K0.00Na1.00AlSi2O5.06(OH)1.87
G = -92253.74 (J) H = -78638.83 (J) S = 13.99 (J/K) V = 2.48 (cc) Cp = 8.67 (J/K)

| leucite | analcime | na-leucite |
|---|---|---|
| 0.43 | 93.62 | 5.95 |

Total solids mass = 98.58 (gm) density = 2.77 (gm/cc)
G = -1516436.98 (J) H = -1327803.16 (J) S = 193.84 (J/K) V = 35.54 (cc) Cp =

**********----------**********
Title: f6i2m2

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 3.50 (log 10 poise)  (analysis in wt %)
G = -1681899.93 (J)  H = -1236492.43 (J)  S = 283.13 (J/K)  V = 40.14 (cc)  Cp = 144.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.01 | 0.00 | 4.89 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1681899.93 (J)  H = -1236492.43 (J)  S = 283.13 (J/K)  V = 40.14 (cc)  Cp = 144.54 (J/K)

Oxygen  delta moles = 5.55112e-17  delta grams = 1.77629e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 3.55 (log 10 poise)  (analysis in wt %)
G = -1679075.24 (J)  H = -1237939.44 (J)  S = 282.21 (J/K)  V = 40.11 (cc)  Cp = 144.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.01 | 0.00 | 4.89 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.55 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1679075.24 (J)  H = -1237939.44 (J)  S = 282.21 (J/K)  V = 40.11 (cc)  Cp = 144.53 (J/K)

Oxygen  delta moles = 3.69989e-06  delta grams = 0.000118392
G = -1.34 (J)  H = 0.16 (J)  S = 0.00 (J/K)  V = 0.48 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1676260.02 (J)  H = -1239386.58 (J)  S = 281.28 (J/K)  V = 40.08 (cc)  Cp = 144.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.01 | 0.00 | 4.89 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1676260.02 (J)  H = -1239386.58 (J)  S = 281.28 (J/K)  V = 40.08 (cc)  Cp = 144.52 (J/K)

Oxygen  delta moles = 7.82016e-06  delta grams = 0.000250236
G = -2.82 (J)  H = 0.33 (J)  S = 0.00 (J/K)  V = 1.01 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.66 (log 10 poise)  (analysis in wt %)
G = -1673454.34 (J)  H = -1240833.85 (J)  S = 280.35 (J/K)  V = 40.05 (cc)  Cp = 144.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.01 | 0.00 | 4.89 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.66 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1673454.34 (J)  H = -1240833.85 (J)  S = 280.35 (J/K)  V = 40.05 (cc)  Cp = 144.51 (J/K)

Oxygen  delta moles = 1.23726e-05  delta grams = 0.00039591
G = -4.42 (J)  H = 0.52 (J)  S = 0.00 (J/K)  V = 1.59 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.71 (log 10 poise)  (analysis in wt %)
G = -1670658.26 (J)  H = -1242281.27 (J)  S = 279.41 (J/K)  V = 40.02 (cc)  Cp = 144.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.01 | 0.00 | 4.89 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1670658.26 (J)  H = -1242281.27 (J)  S = 279.41 (J/K)  V = 40.02 (cc)  Cp = 144.51 (J/K)

Oxygen  delta moles = 1.73697e-05  delta grams = 0.000555809
G = -6.17 (J)  H = 0.73 (J)  S = 0.00 (J/K)  V = 2.21 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.77 (log 10 poise)  (analysis in wt %)
G = -1667871.85 (J)  H = -1243728.83 (J)  S = 278.46 (J/K)  V = 39.99 (cc)  Cp = 144.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.01 | 0.00 | 4.89 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1667871.85 (J)  H = -1243728.83 (J)  S = 278.46 (J/K)  V = 39.99 (cc)  Cp = 144.50 (J/K)

Oxygen  delta moles = 2.28241e-05  delta grams = 0.000730345
G = -8.04 (J)  H = 0.95 (J)  S = 0.01 (J/K)  V = 2.89 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 3.83 (log 10 poise) (analysis in wt %)
G = -1665095.17 (J) H = -1245176.55 (J) S = 277.51 (J/K) V = 39.96 (cc) Cp = 144.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.02 | 0.00 | 4.88 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.83 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1665095.17 (J) H = -1245176.55 (J) S = 277.51 (J/K) V = 39.96 (cc) Cp = 144.49 (J/K)

Oxygen delta moles = 2.87494e-05 delta grams = 0.000919946
G = -10.06 (J) H = 1.18 (J) S = 0.01 (J/K) V = 3.62 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 3.88 (log 10 poise) (analysis in wt %)
G = -1662328.30 (J) H = -1246624.44 (J) S = 276.56 (J/K) V = 39.93 (cc) Cp = 144.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.02 | 0.00 | 4.88 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1662328.30 (J) H = -1246624.44 (J) S = 276.56 (J/K) V = 39.93 (cc) Cp = 144.49 (J/K)

Oxygen delta moles = 3.51594e-05 delta grams = 0.00112506
G = -12.21 (J) H = 1.43 (J) S = 0.01 (J/K) V = 4.39 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.51 (gm/cc) viscosity = 3.94 (log 10 poise) (analysis in wt %)
G = -1659571.30 (J) H = -1248072.50 (J) S = 275.59 (J/K) V = 39.90 (cc) Cp = 144.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.02 | 0.00 | 4.88 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.94 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1659571.30 (J) H = -1248072.50 (J) S = 275.59 (J/K) V = 39.90 (cc) Cp = 144.48 (J/K)

Oxygen delta moles = 4.20689e-05 delta grams = 0.00134615
G = -14.50 (J) H = 1.70 (J) S = 0.01 (J/K) V = 5.22 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.51 (gm/cc) viscosity = 4.00 (log 10 poise) (analysis in wt %)
G = -1656824.26 (J) H = -1249520.76 (J) S = 274.62 (J/K) V = 39.87 (cc) Cp = 144.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.02 | 0.00 | 4.88 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.00 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1656824.26 (J) H = -1249520.76 (J) S = 274.62 (J/K) V = 39.87 (cc) Cp = 144.47 (J/K)

Oxygen delta moles = 4.94929e-05 delta grams = 0.00158371
G = -16.93 (J) H = 1.98 (J) S = 0.01 (J/K) V = 6.10 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.51 (gm/cc) viscosity = 4.06 (log 10 poise) (analysis in wt %)
G = -1654087.12 (J) H = -1250922.73 (J) S = 273.68 (J/K) V = 39.84 (cc) Cp = 137.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 1.02 | 0.00 | 4.88 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.06 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1654087.12 (J) H = -1250922.73 (J) S = 273.68 (J/K) V = 39.84 (cc) Cp = 137.68 (J/K)

Oxygen delta moles = 5.74473e-05 delta grams = 0.00183825
G = -19.51 (J) H = 2.28 (J) S = 0.01 (J/K) V = 7.04 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 99.17 (gm) density = 2.51 (gm/cc) viscosity = 4.15 (log 10 poise) (analysis in wt %)
G = -1638375.36 (J) H = -1242575.14 (J) S = 270.51 (J/K) V = 39.52 (cc) Cp = 136.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.57 | 0.65 | 14.27 | 1.02 | 0.00 | 4.80 | 0.11 | 2.46 | 0.00 | 0.00 | 4.39 | 3.86 | 1.69 | 0.16 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.83 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.46Mg1.44Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -12962.01 (J) H = -10034.78 (J) S = 2.00 (J/K) V = 0.25 (cc) Cp = 1.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -46.98 | 95.33 | 45.70 | 3.48 | -3.22 | 5.42 | 0.26 |

Total solids mass = 0.83 (gm) density = 3.30 (gm/cc)
G = -12962.01 (J) H = -10034.78 (J) S = 2.00 (J/K) V = 0.25 (cc) Cp = 1.03 (J/K)

Viscosity of the System: 4.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1651337.37 (J) H = -1252609.92 (J) S = 272.51 (J/K) V = 39.77 (cc) Cp = 137.38 (J/K)

Oxygen delta moles = 2.32006e-05 delta grams = 0.000742393
G = -7.82 (J) H = 0.91 (J) S = 0.01 (J/K) V = 2.82 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW

= 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 98.49 (gm) density = 2.51 (gm/cc) viscosity = 4.24 (log 10 poise) (analysis in wt %)
G = -1625202.70 (J) H = -1236088.03 (J) S = 267.77 (J/K) V = 39.26 (cc) Cp = 135.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.65 | 0.66 | 14.35 | 1.01 | 0.00 | 4.73 | 0.11 | 2.30 | 0.00 | 0.00 | 4.41 | 3.89 | 1.70 | 0.16 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.51 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.47Mg1.42Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -23398.55 (J) H = -18145.90 (J) S = 3.61 (J/K) V = 0.46 (cc) Cp = 1.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -48.47 | 95.08 | 47.32 | 3.56 | -3.29 | 5.53 | 0.28 |

Total solids mass = 1.51 (gm) density = 3.30 (gm/cc)
G = -23398.55 (J) H = -18145.90 (J) S = 3.61 (J/K) V = 0.46 (cc) Cp = 1.87 (J/K)

Viscosity of the System: 4.26 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1648601.26 (J) H = -1254233.93 (J) S = 271.39 (J/K) V = 39.71 (cc) Cp = 137.14 (J/K)

Oxygen delta moles = -6.69639e-06 delta grams = -0.000214276
G = 2.24 (J) H = -0.26 (J) S = -0.00 (J/K) V = -0.81 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 97.83 (gm) density = 2.51 (gm/cc) viscosity = 4.33 (log 10 poise) (analysis in wt %)
G = -1612407.59 (J) H = -1229846.91 (J) S = 265.09 (J/K) V = 39.00 (cc) Cp = 134.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.74 | 0.66 | 14.43 | 1.00 | 0.00 | 4.65 | 0.11 | 2.15 | 0.00 | 0.00 | 4.43 | 3.91 | 1.71 | 0.17 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.17 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.49Mg1.40Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -33467.50 (J) H = -25999.36 (J) S = 5.17 (J/K) V = 0.66 (cc) Cp = 2.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.00 | 94.82 | 48.98 | 3.64 | -3.38 | 5.64 | 0.29 |

Total solids mass = 2.17 (gm) density = 3.31 (gm/cc)
G = -33467.50 (J) H = -25999.36 (J) S = 5.17 (J/K) V = 0.66 (cc) Cp = 2.68 (J/K)

Viscosity of the System: 4.36 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1645875.09 (J) H = -1255846.27 (J) S = 270.26 (J/K) V = 39.66 (cc) Cp = 136.90 (J/K)

Oxygen delta moles = -3.90039e-05 delta grams = -0.00124808
G = 12.94 (J) H = -1.50 (J) S = -0.01 (J/K) V = -4.68 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 97.18 (gm) density = 2.51 (gm/cc) viscosity = 4.43 (log 10 poise) (analysis in wt %)
G = -1599962.19 (J) H = -1223832.51 (J) S = 262.45 (J/K) V = 38.75 (cc) Cp = 133.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.82 | 0.66 | 14.51 | 0.99 | 0.00 | 4.57 | 0.11 | 2.01 | 0.00 | 0.00 | 4.45 | 3.94 | 1.73 | 0.17 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.82 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.51Mg1.38Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -43196.62 (J) H = -33615.23 (J) S = 6.69 (J/K) V = 0.85 (cc) Cp = 3.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -51.55 | 94.55 | 50.67 | 3.73 | -3.47 | 5.76 | 0.30 |

Total solids mass = 2.82 (gm) density = 3.32 (gm/cc)
G = -43196.62 (J) H = -33615.23 (J) S = 6.69 (J/K) V = 0.85 (cc) Cp = 3.47 (J/K)

Viscosity of the System: 4.46 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1643158.81 (J) H = -1257447.74 (J) S = 269.14 (J/K) V = 39.60 (cc) Cp = 136.67 (J/K)

Oxygen delta moles = -7.38488e-05 delta grams = -0.00236307
G = 24.32 (J) H = -2.82 (J) S = -0.02 (J/K) V = -8.80 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 96.54 (gm) density = 2.51 (gm/cc) viscosity = 4.52 (log 10 poise) (analysis in wt %)
G = -1587841.30 (J) H = -1218027.29 (J) S = 259.86 (J/K) V = 38.51 (cc) Cp = 132.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.91 | 0.67 | 14.59 | 0.98 | 0.00 | 4.49 | 0.12 | 1.87 | 0.00 | 0.00 | 4.47 | 3.96 | 1.74 | 0.17 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.46 (gm) density = 3.33 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.05Fe"0.52Mg1.36Fe'''0.02Ti0.00Al0.10Si1.94O6
G = -52611.07 (J) H = -41011.75 (J) S = 8.15 (J/K) V = 1.04 (cc) Cp = 4.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.13 | 94.28 | 52.39 | 3.82 | -3.56 | 5.88 | 0.31 |

Total solids mass = 3.46 (gm) density = 3.33 (gm/cc)
G = -52611.07 (J) H = -41011.75 (J) S = 8.15 (J/K) V = 1.04 (cc) Cp = 4.24 (J/K)

Viscosity of the System: 4.57 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1640452.37 (J) H = -1259039.04 (J) S = 268.01 (J/K) V = 39.54 (cc) Cp = 136.44 (J/K)

Oxygen delta moles = -0.000111344 delta grams = -0.00356289
G = 36.38 (J) H = -4.21 (J) S = -0.03 (J/K) V = -13.17 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1140.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.26 COH = 2.13 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 95.92 (gm) density = 2.51 (gm/cc) viscosity = 4.61 (log 10 poise) (analysis in wt %)
G = -1576022.41 (J) H = -1212415.47 (J) S = 257.30 (J/K) V = 38.27 (cc) Cp = 131.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.00 | 0.67 | 14.67 | 0.96 | 0.00 | 4.39 | 0.12 | 1.74 | 0.00 | 0.00 | 4.49 | 3.99 | 1.75 | 0.17 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.08 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.54Mg1.33Fe'''0.02Ti0.00Al0.10Si1.94O6
G = -61733.34 (J) H = -48205.34 (J) S = 9.57 (J/K) V = 1.22 (cc) Cp = 4.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.73 | 93.99 | 54.14 | 3.92 | -3.65 | 6.01 | 0.32 |

Total solids mass = 4.08 (gm) density = 3.34 (gm/cc)
G = -61733.34 (J) H = -48205.34 (J) S = 9.57 (J/K) V = 1.22 (cc) Cp = 4.98 (J/K)

Viscosity of the System: 4.67 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1637755.75 (J) H = -1260620.81 (J) S = 266.88 (J/K) V = 39.49 (cc) Cp = 136.22 (J/K)

Oxygen delta moles = -0.000151587 delta grams = -0.0048506
G = 49.14 (J) H = -5.67 (J) S = -0.04 (J/K) V = -17.81 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 95.30 (gm) density = 2.51 (gm/cc) viscosity = 4.71 (log 10 poise) (analysis in wt %)
G = -1564485.58 (J) H = -1206983.02 (J) S = 254.79 (J/K) V = 38.03 (cc) Cp = 130.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.10 | 0.68 | 14.75 | 0.95 | 0.00 | 4.29 | 0.12 | 1.62 | 0.00 | 0.00 | 4.50 | 4.01 | 1.76 | 0.17 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.69 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.56Mg1.31Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -70583.35 (J) H = -55210.57 (J) S = 10.96 (J/K) V = 1.40 (cc) Cp = 5.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.34 | 93.70 | 55.90 | 4.02 | -3.75 | 6.14 | 0.34 |

Total solids mass = 4.69 (gm) density = 3.35 (gm/cc)
G = -70583.35 (J) H = -55210.57 (J) S = 10.96 (J/K) V = 1.40 (cc) Cp = 5.71 (J/K)

Viscosity of the System: 4.77 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1635068.93 (J) H = -1262193.59 (J) S = 265.74 (J/K) V = 39.43 (cc) Cp = 136.00 (J/K)

Oxygen delta moles = -0.000194654 delta grams = -0.0062287
G = 62.60 (J) H = -7.21 (J) S = -0.05 (J/K) V = -22.71 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1120.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.25 COH = 2.09 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 94.70 (gm) density = 2.51 (gm/cc) viscosity = 4.81 (log 10 poise) (analysis in wt %)
G = -1553213.44 (J) H = -1201717.61 (J) S = 252.30 (J/K) V = 37.80 (cc) Cp = 129.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.19 | 0.68 | 14.82 | 0.93 | 0.00 | 4.19 | 0.12 | 1.50 | 0.00 | 0.00 | 4.52 | 4.04 | 1.77 | 0.17 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.29 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.58Mg1.29Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -79178.47 (J) H = -62040.24 (J) S = 12.30 (J/K) V = 1.58 (cc) Cp = 6.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.97 | 93.40 | 57.68 | 4.13 | -3.86 | 6.27 | 0.35 |

Total solids mass = 5.29 (gm) density = 3.36 (gm/cc)
G = -79178.47 (J) H = -62040.24 (J) S = 12.30 (J/K) V = 1.58 (cc) Cp = 6.42 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1632391.92 (J) H = -1263757.85 (J) S = 264.60 (J/K) V = 39.38 (cc) Cp = 135.78 (J/K)

Oxygen delta moles = -0.000240604 delta grams = -0.00769902
G = 76.76 (J) H = -8.83 (J) S = -0.06 (J/K) V = -27.87 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1110.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.24 COH = 2.07 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 94.11 (gm) density = 2.50 (gm/cc) viscosity = 4.91 (log 10 poise) (analysis in wt %)
G = -1542191.10 (J) H = -1196608.59 (J) S = 249.85 (J/K) V = 37.58 (cc) Cp = 128.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.29 | 0.68 | 14.90 | 0.92 | 0.00 | 4.08 | 0.12 | 1.39 | 0.00 | 0.00 | 4.53 | 4.06 | 1.78 | 0.17 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.88 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.59Mg1.27Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -87533.63 (J) H = -68705.37 (J) S = 13.61 (J/K) V = 1.75 (cc) Cp = 7.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.60 | 93.09 | 59.46 | 4.24 | -3.97 | 6.42 | 0.37 |

Total solids mass = 5.88 (gm) density = 3.36 (gm/cc)
G = -87533.63 (J) H = -68705.37 (J) S = 13.61 (J/K) V = 1.75 (cc) Cp = 7.12 (J/K)

Viscosity of the System: 4.99 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1629724.72 (J) H = -1265313.96 (J) S = 263.46 (J/K) V = 39.32 (cc) Cp = 135.57 (J/K)

Oxygen delta moles = -0.000289469 delta grams = -0.00926268
G = 91.62 (J) H = -10.52 (J) S = -0.07 (J/K) V = -33.29 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1100.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.05 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 93.04 (gm) density = 2.50 (gm/cc) viscosity = 5.00 (log 10 poise) (analysis in wt %)
G = -1523337.25 (J) H = -1185312.14 (J) S = 246.17 (J/K) V = 37.17 (cc) Cp = 126.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.44 | 0.69 | 14.92 | 0.90 | 0.00 | 3.98 | 0.12 | 1.29 | 0.00 | 0.00 | 4.53 | 4.08 | 1.80 | 0.17 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.51 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.61Mg1.24Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -96305.24 (J) H = -75716.14 (J) S = 14.99 (J/K) V = 1.93 (cc) Cp = 7.85 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-61.41 92.83 61.40 4.34 -4.06 6.54 0.38

feldspar mass = 0.44 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.56Ca0.42Al1.42Si2.58O8
G = -7421.18 (J) H = -5968.26 (J) S = 1.06 (J/K) V = 0.17 (cc) Cp = 0.54 (J/K)
albite anorthite sanidine
55.81 42.50 1.69

Total solids mass = 6.95 (gm) density = 3.31 (gm/cc)
G = -103726.43 (J) H = -81684.40 (J) S = 16.05 (J/K) V = 2.10 (cc) Cp = 8.39 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1627063.68 (J) H = -1266996.53 (J) S = 262.22 (J/K) V = 39.26 (cc) Cp = 135.26 (J/K)

Oxygen delta moles = -0.000348196 delta grams = -0.0111419
G = 109.32 (J) H = -12.52 (J) S = -0.09 (J/K) V = -39.75 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 88.76 (gm) density = 2.50 (gm/cc) viscosity = 5.11 (log 10 poise) (analysis in wt %)
G = -1451952.69 (J) H = -1132730.68 (J) S = 234.18 (J/K) V = 35.54 (cc) Cp = 120.74 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.97 0.72 14.65 0.88 0.00 3.87 0.13 1.17 0.00 0.00 4.37 4.04 1.88 0.18 1.14 0.00 0.00 0.00 0.00

orthopyroxene mass = 5.66 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.64Mg1.22Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -83015.06 (J) H = -65358.21 (J) S = 12.95 (J/K) V = 1.67 (cc) Cp = 6.79 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-64.07 92.94 63.99 4.28 -4.00 6.49 0.38

clinopyroxene mass = 1.99 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.66Mg1.06Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -28925.63 (J) H = -22698.47 (J) S = 4.57 (J/K) V = 0.59 (cc) Cp = 2.35 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-59.37 82.73 66.32 5.42 -4.87 8.65 1.13

feldspar mass = 3.58 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.57Ca0.41Al1.41Si2.59O8
G = -60496.93 (J) H = -48756.48 (J) S = 8.61 (J/K) V = 1.36 (cc) Cp = 4.38 (J/K)
albite anorthite sanidine
56.92 41.28 1.80

Total solids mass = 11.23 (gm) density = 3.10 (gm/cc)

G = -172437.62 (J)  H = -136813.17 (J)  S = 26.13 (J/K)  V = 3.62 (cc)  Cp = 13.52 (J/K)

Viscosity of the System: 5.29 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.55 (gm/cc)
G = -1624390.31 (J)  H = -1269543.84 (J)  S = 260.31 (J/K)  V = 39.16 (cc)  Cp = 134.27 (J/K)

Oxygen  delta moles = -0.000459453  delta grams = -0.0147019
G = 143.07 (J)  H = -16.36 (J)  S = -0.12 (J/K)  V = -52.07 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1080.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.22  COH = 2.01  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 84.80 (gm)  density = 2.49 (gm/cc)  viscosity = 5.21 (log 10 poise)  (analysis in wt %)
G = -1386047.72 (J)  H = -1084174.86 (J)  S = 223.09 (J/K)  V = 34.03 (cc)  Cp = 115.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.50 | 0.75 | 14.38 | 0.86 | 0.00 | 3.76 | 0.13 | 1.07 | 0.00 | 0.00 | 4.23 | 3.99 | 1.95 | 0.19 | 1.19 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.00 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.07Fe"0.67Mg1.20Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -72854.36 (J)  H = -57440.52 (J)  S = 11.39 (J/K)  V = 1.47 (cc)  Cp = 5.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.69 | 93.05 | 66.55 | 4.22 | -3.94 | 6.44 | 0.38 |

clinopyroxene  mass = 3.68 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.69Mg1.04Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -52970.91 (J)  H = -41628.59 (J)  S = 8.38 (J/K)  V = 1.08 (cc)  Cp = 4.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.89 | 82.91 | 68.73 | 5.32 | -4.75 | 8.56 | 1.14 |

feldspar  mass = 6.51 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.02Na0.58Ca0.40Al1.40Si2.60O8
G = -109862.50 (J)  H = -88731.95 (J)  S = 15.62 (J/K)  V = 2.48 (cc)  Cp = 7.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 57.91 | 40.18 | 1.91 |

Total solids  mass = 15.19 (gm)  density = 3.02 (gm/cc)
G = -235687.77 (J)  H = -187801.06 (J)  S = 35.39 (J/K)  V = 5.03 (cc)  Cp = 18.26 (J/K)

Viscosity of the System: 5.47 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.56 (gm/cc)
G = -1621735.49 (J)  H = -1271975.92 (J)  S = 258.48 (J/K)  V = 39.06 (cc)  Cp = 133.35 (J/K)

Oxygen  delta moles = -0.000571157  delta grams = -0.0182763
G = 176.41 (J)  H = -20.13 (J)  S = -0.15 (J/K)  V = -64.26 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1070.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.22  COH = 1.99  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 81.13 (gm)  density = 2.49 (gm/cc)  viscosity = 5.31 (log 10 poise)  (analysis in wt %)
G = -1325164.21 (J)  H = -1039310.38 (J)  S = 212.82 (J/K)  V = 32.62 (cc)  Cp = 109.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.01 | 0.79 | 14.11 | 0.84 | 0.00 | 3.63 | 0.14 | 0.97 | 0.00 | 0.00 | 4.11 | 3.93 | 2.03 | 0.20 | 1.24 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.56 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.69Mg1.17Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -65973.80 (J)  H = -52091.90 (J)  S = 10.34 (J/K)  V = 1.34 (cc)  Cp = 5.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.26 | 93.16 | 69.06 | 4.17 | -3.88 | 6.38 | 0.37 |

clinopyroxene  mass = 5.05 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.71Mg1.02Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -72176.27 (J)  H = -56808.43 (J)  S = 11.44 (J/K)  V = 1.48 (cc)  Cp = 5.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.26 | 83.02 | 71.06 | 5.22 | -4.64 | 8.46 | 1.14 |

feldspar  mass = 9.24 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.02Na0.59Ca0.39Al1.39Si2.61O8
G = -155784.38 (J)  H = -126093.45 (J)  S = 22.11 (J/K)  V = 3.52 (cc)  Cp = 11.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.80 | 39.19 | 2.01 |

Total solids  mass = 18.85 (gm)  density = 2.97 (gm/cc)
G = -293934.44 (J)  H = -234993.77 (J)  S = 43.88 (J/K)  V = 6.34 (cc)  Cp = 22.63 (J/K)

Viscosity of the System: 5.66 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.57 (gm/cc)
G = -1619098.65 (J)  H = -1274304.16 (J)  S = 256.71 (J/K)  V = 38.97 (cc)  Cp = 132.51 (J/K)

Oxygen  delta moles = -0.000683122  delta grams = -0.0218591
G = 209.25 (J)  H = -23.83 (J)  S = -0.17 (J/K)  V = -76.29 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1060.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.21  COH = 1.97  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 77.73 (gm)  density = 2.48 (gm/cc)  viscosity = 5.42 (log 10 poise)  (analysis in wt %)
G = -1268892.07 (J)  H = -997838.80 (J)  S = 203.32 (J/K)  V = 31.33 (cc)  Cp = 105.06 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.51 0.82 13.85 0.81 0.00 3.49 0.14 0.89 0.00 0.00 4.01 3.87 2.10 0.21 1.30 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.34 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.72Mg1.15Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -62331.54 (J) H = -49290.18 (J) S = 9.78 (J/K) V = 1.27 (cc) Cp = 5.16 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-71.76 93.26 71.52 4.11 -3.83 6.33 0.37

clinopyroxene mass = 6.11 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.73Mg1.00Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -86754.60 (J) H = -68391.16 (J) S = 13.77 (J/K) V = 1.79 (cc) Cp = 7.11 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-66.47 83.06 73.31 5.12 -4.52 8.36 1.15

feldspar mass = 11.79 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.60Ca0.38Al1.38Si2.62O8
G = -198501.10 (J) H = -161018.35 (J) S = 28.12 (J/K) V = 4.50 (cc) Cp = 14.40 (J/K)
albite anorthite sanidine
59.58 38.30 2.11

Total solids mass = 22.24 (gm) density = 2.94 (gm/cc)
G = -347587.24 (J) H = -278699.69 (J) S = 51.67 (J/K) V = 7.55 (cc) Cp = 26.67 (J/K)

Viscosity of the System: 5.84 (log 10 poise)

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1616479.31 (J) H = -1276538.49 (J) S = 254.99 (J/K) V = 38.88 (cc) Cp = 131.73 (J/K)

Oxygen delta moles = -0.000795125 delta grams = -0.025443
G = 241.54 (J) H = -27.45 (J) S = -0.20 (J/K) V = -88.13 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1050.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.95 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 74.59 (gm) density = 2.48 (gm/cc) viscosity = 5.51 (log 10 poise) (analysis in wt %)
G = -1216859.69 (J) H = -959490.06 (J) S = 194.51 (J/K) V = 30.12 (cc) Cp = 100.62 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.99 0.85 13.60 0.79 0.00 3.35 0.15 0.81 0.00 0.00 3.91 3.79 2.17 0.22 1.35 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.33 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.74Mg1.13Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -61740.00 (J) H = -48898.17 (J) S = 9.71 (J/K) V = 1.26 (cc) Cp = 5.13 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-74.18 93.35 73.91 4.06 -3.77 6.27 0.37

clinopyroxene mass = 6.88 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.75Mg0.98Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -97046.09 (J) H = -76630.45 (J) S = 15.43 (J/K) V = 2.01 (cc) Cp = 7.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.51 | 83.03 | 75.47 | 5.02 | -4.41 | 8.25 | 1.15 |

feldspar mass = 14.17 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.60Ca0.38Al1.38Si2.62O8
G = -238231.30 (J) H = -193668.99 (J) S = 33.68 (J/K) V = 5.40 (cc) Cp = 17.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.28 | 37.51 | 2.21 |

Total solids mass = 25.38 (gm) density = 2.93 (gm/cc)
G = -397017.39 (J) H = -319197.61 (J) S = 58.81 (J/K) V = 8.68 (cc) Cp = 30.40 (J/K)

Viscosity of the System: 6.03 (log 10 poise)

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1613877.07 (J) H = -1278687.67 (J) S = 253.33 (J/K) V = 38.80 (cc) Cp = 131.01 (J/K)

Oxygen delta moles = -0.000906894 delta grams = -0.0290195
G = 273.19 (J) H = -30.98 (J) S = -0.23 (J/K) V = -99.77 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1040.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.93 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 71.68 (gm) density = 2.47 (gm/cc) viscosity = 5.61 (log 10 poise) (analysis in wt %)
G = -1168727.54 (J) H = -924017.61 (J) S = 186.35 (J/K) V = 29.00 (cc) Cp = 96.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.47 | 0.89 | 13.35 | 0.76 | 0.00 | 3.21 | 0.15 | 0.75 | 0.00 | 0.00 | 3.83 | 3.71 | 2.25 | 0.23 | 1.41 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.52 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.76Mg1.10Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -63891.28 (J) H = -50682.99 (J) S = 10.06 (J/K) V = 1.31 (cc) Cp = 5.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.51 | 93.43 | 76.22 | 4.01 | -3.72 | 6.20 | 0.36 |

clinopyroxene mass = 7.38 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.78Mg0.96Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -103496.12 (J) H = -81863.84 (J) S = 16.47 (J/K) V = 2.15 (cc) Cp = 8.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.37 | 82.92 | 77.52 | 4.92 | -4.29 | 8.13 | 1.16 |

feldspar mass = 16.39 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.61Ca0.37Al1.37Si2.63O8
G = -275176.70 (J) H = -224194.98 (J) S = 38.82 (J/K) V = 6.25 (cc) Cp = 19.98 (J/K)

albite anorthite sanidine
60.90 36.80 2.31

Total solids mass = 28.29 (gm) density = 2.91 (gm/cc)
G = -442564.10 (J) H = -356741.82 (J) S = 65.36 (J/K) V = 9.72 (cc) Cp = 33.84 (J/K)

Viscosity of the System: 6.22 (log 10 poise)

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1611291.63 (J) H = -1280759.43 (J) S = 251.71 (J/K) V = 38.72 (cc) Cp = 130.35 (J/K)

Oxygen delta moles = -0.00101809 delta grams = -0.0325778
G = 304.11 (J) H = -34.41 (J) S = -0.26 (J/K) V = -111.15 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1030.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.19 COH = 1.91 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 68.98 (gm) density = 2.47 (gm/cc) viscosity = 5.71 (log 10 poise) (analysis in wt %)
G = -1124178.36 (J) H = -891190.69 (J) S = 178.79 (J/K) V = 27.97 (cc) Cp = 92.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.94 | 0.92 | 13.11 | 0.73 | 0.00 | 3.06 | 0.16 | 0.68 | 0.00 | 0.00 | 3.76 | 3.63 | 2.32 | 0.23 | 1.46 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.87 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.78Mg1.08Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -68389.44 (J) H = -54340.97 (J) S = 10.78 (J/K) V = 1.41 (cc) Cp = 5.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -78.74 | 93.51 | 78.45 | 3.95 | -3.66 | 6.13 | 0.36 |

clinopyroxene mass = 7.65 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.79Mg0.94Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -106625.29 (J) H = -84489.68 (J) S = 16.99 (J/K) V = 2.22 (cc) Cp = 8.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.02 | 82.74 | 79.46 | 4.83 | -4.18 | 8.00 | 1.17 |

feldspar mass = 18.46 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.61Ca0.36Al1.36Si2.64O8
G = -309529.67 (J) H = -252741.00 (J) S = 43.58 (J/K) V = 7.05 (cc) Cp = 22.67 (J/K)

albite anorthite sanidine
61.44 36.16 2.40

Total solids mass = 30.98 (gm) density = 2.90 (gm/cc)
G = -484544.40 (J) H = -391571.65 (J) S = 71.34 (J/K) V = 10.68 (cc) Cp = 37.20 (J/K)

Viscosity of the System: 6.41 (log 10 poise)

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1608722.77 (J) H = -1282762.34 (J) S = 250.13 (J/K) V = 38.65 (cc) Cp = 129.90 (J/K)

Oxygen delta moles = -0.00112833 delta grams = -0.0361053
G = 334.18 (J) H = -37.73 (J) S = -0.29 (J/K) V = -122.25 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1020.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.89 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 66.48 (gm) density = 2.46 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -1082919.26 (J) H = -860796.05 (J) S = 171.77 (J/K) V = 27.00 (cc) Cp = 89.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.40 | 0.95 | 12.87 | 0.70 | 0.00 | 2.90 | 0.17 | 0.63 | 0.00 | 0.00 | 3.70 | 3.54 | 2.39 | 0.24 | 1.52 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.36 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.81Mg1.06Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -74777.51 (J) H = -59518.41 (J) S = 11.80 (J/K) V = 1.55 (cc) Cp = 6.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.86 | 93.57 | 80.59 | 3.90 | -3.61 | 6.06 | 0.35 |

clinopyroxene mass = 7.73 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.81Mg0.92Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -107004.23 (J) H = -84947.89 (J) S = 17.06 (J/K) V = 2.24 (cc) Cp = 8.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.46 | 82.48 | 81.26 | 4.73 | -4.06 | 7.87 | 1.18 |

feldspar mass = 20.40 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.62Ca0.36Al1.36Si2.64O8
G = -341469.31 (J) H = -279439.15 (J) S = 47.97 (J/K) V = 7.79 (cc) Cp = 25.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.92 | 35.59 | 2.48 |

Total solids mass = 33.48 (gm) density = 2.89 (gm/cc)
G = -523251.06 (J) H = -423905.45 (J) S = 76.82 (J/K) V = 11.57 (cc) Cp = 40.16 (J/K)

Viscosity of the System: 6.60 (log 10 poise)

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1606170.32 (J) H = -1284701.50 (J) S = 248.59 (J/K) V = 38.58 (cc) Cp = 129.35 (J/K)

Oxygen delta moles = -0.00123716 delta grams = -0.0395878
G = 363.29 (J) H = -40.93 (J) S = -0.31 (J/K) V = -133.02 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1010.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.86 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 64.16 (gm) density = 2.46 (gm/cc) viscosity = 5.90 (log 10 poise) (analysis in wt %)
G = -1044688.13 (J) H = -832643.23 (J) S = 165.25 (J/K) V = 26.11 (cc) Cp = 85.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.85 | 0.99 | 12.63 | 0.67 | 0.00 | 2.75 | 0.17 | 0.58 | 0.00 | 0.00 | 3.64 | 3.45 | 2.46 | 0.25 | 1.57 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.95 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.83Mg1.05Fe"'0.02Ti0.00Al0.10Si1.94O6
G = -82565.15 (J) H = -65833.17 (J) S = 13.04 (J/K) V = 1.72 (cc) Cp = 6.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.86 | 93.63 | 82.62 | 3.84 | -3.55 | 5.97 | 0.35 |

clinopyroxene mass = 7.64 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.83Mg0.90Fe"'0.04Ti0.00Al0.14Si1.92O6
G = -105227.28 (J) H = -83699.57 (J) S = 16.78 (J/K) V = 2.21 (cc) Cp = 8.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.66 | 82.13 | 82.92 | 4.63 | -3.94 | 7.72 | 1.20 |

feldspar mass = 22.21 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.62Ca0.35Al1.35Si2.65O8
G = -371153.65 (J) H = -304406.22 (J) S = 52.02 (J/K) V = 8.48 (cc) Cp = 27.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.35 | 35.08 | 2.57 |

Total solids mass = 35.80 (gm) density = 2.89 (gm/cc)
G = -558946.08 (J) H = -453938.95 (J) S = 81.84 (J/K) V = 12.40 (cc) Cp = 42.89 (J/K)

Viscosity of the System: 6.80 (log 10 poise)

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1603634.21 (J) H = -1286582.18 (J) S = 247.09 (J/K) V = 38.51 (cc) Cp = 128.83 (J/K)

Oxygen delta moles = -0.00134408 delta grams = -0.0430089
G = 391.29 (J) H = -43.98 (J) S = -0.34 (J/K) V = -143.39 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 1000.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.17 COH = 1.84 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 61.53 (gm) density = 2.45 (gm/cc) viscosity = 5.97 (log 10 poise) (analysis in wt %)
G = -1001273.70 (J) H = -800063.70 (J) S = 158.04 (J/K) V = 25.08 (cc) Cp = 82.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.18 | 1.03 | 12.44 | 0.64 | 0.00 | 2.60 | 0.18 | 0.53 | 0.00 | 0.00 | 3.59 | 3.37 | 2.54 | 0.26 | 1.64 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.38 (gm) density = 3.48 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.06Fe"0.84Mg1.03Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -87992.43 (J) H = -70291.35 (J) S = 13.90 (J/K) V = 1.84 (cc) Cp = 7.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.67 | 93.68 | 84.45 | 3.80 | -3.50 | 5.89 | 0.34 |

clinopyroxene mass = 7.72 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.84Mg0.88Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -105752.70 (J) H = -84291.28 (J) S = 16.86 (J/K) V = 2.23 (cc) Cp = 8.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.51 | 81.66 | 84.32 | 4.56 | -3.84 | 7.59 | 1.22 |

feldspar mass = 24.01 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.35Al1.35Si2.65O8
G = -400773.27 (J) H = -329430.80 (J) S = 56.04 (J/K) V = 9.17 (cc) Cp = 29.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.70 | 34.64 | 2.67 |

quartz mass = 0.32 (gm) density = 2.55 (gm/cc)
SiO2
G = -5323.38 (J) H = -4422.82 (J) S = 0.71 (J/K) V = 0.12 (cc) Cp = 0.38 (J/K)

Total solids mass = 38.43 (gm) density = 2.88 (gm/cc)
G = -599841.78 (J) H = -488436.25 (J) S = 87.50 (J/K) V = 13.35 (cc) Cp = 46.00 (J/K)

Viscosity of the System: 7.01 (log 10 poise)

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1601115.48 (J) H = -1288499.95 (J) S = 245.54 (J/K) V = 38.44 (cc) Cp = 128.30 (J/K)

Oxygen delta moles = -0.00144665 delta grams = -0.0462911
G = 417.50 (J) H = -46.82 (J) S = -0.36 (J/K) V = -153.13 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 990.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.16 COH = 1.82 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 57.57 (gm) density = 2.45 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -936207.44 (J) H = -749569.90 (J) S = 147.76 (J/K) V = 23.51 (cc) Cp = 77.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.14 | 1.10 | 12.39 | 0.61 | 0.00 | 2.48 | 0.19 | 0.50 | 0.00 | 0.00 | 3.54 | 3.33 | 2.69 | 0.28 | 1.75 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.15 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.86Mg1.01Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -84378.44 (J) H = -67541.12 (J) S = 13.33 (J/K) V = 1.76 (cc) Cp = 7.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.14 | 93.73 | 85.89 | 3.80 | -3.48 | 5.86 | 0.34 |

clinopyroxene mass = 8.53 (gm) density = 3.47 (gm/cc) (analysis in mole %)

cpx Na0.01Ca0.18Fe"0.85Mg0.87Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -116514.29 (J) H = -93079.90 (J) S = 18.55 (J/K) V = 2.46 (cc) Cp = 9.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.78 | 81.01 | 85.21 | 4.55 | -3.76 | 7.52 | 1.26 |

feldspar mass = 26.05 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -434195.64 (J) H = -357698.39 (J) S = 60.56 (J/K) V = 9.95 (cc) Cp = 31.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.90 | 34.28 | 2.83 |

quartz mass = 1.64 (gm) density = 2.55 (gm/cc)
SiO2
G = -27323.78 (J) H = -22750.99 (J) S = 3.62 (J/K) V = 0.64 (cc) Cp = 1.94 (J/K)

Total solids mass = 42.38 (gm) density = 2.86 (gm/cc)
G = -662412.15 (J) H = -541070.41 (J) S = 96.06 (J/K) V = 14.81 (cc) Cp = 50.65 (J/K)

Viscosity of the System: 7.27 (log 10 poise)

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1598619.59 (J) H = -1290640.31 (J) S = 243.82 (J/K) V = 38.32 (cc) Cp = 127.66 (J/K)

Oxygen delta moles = -0.00153789 delta grams = -0.0492106
G = 439.96 (J) H = -49.22 (J) S = -0.39 (J/K) V = -161.51 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 980.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.15 COH = 1.80 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 54.04 (gm) density = 2.44 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -878004.67 (J) H = -704377.70 (J) S = 138.55 (J/K) V = 22.11 (cc) Cp = 72.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 1.16 | 12.34 | 0.59 | 0.00 | 2.36 | 0.21 | 0.46 | 0.00 | 0.00 | 3.50 | 3.29 | 2.83 | 0.30 | 1.87 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.11 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.87Mg1.00Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -83449.97 (J) H = -66936.19 (J) S = 13.18 (J/K) V = 1.75 (cc) Cp = 7.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.53 | 93.77 | 87.25 | 3.80 | -3.46 | 5.83 | 0.34 |

clinopyroxene mass = 9.09 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.86Mg0.85Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -123679.47 (J) H = -99036.08 (J) S = 19.67 (J/K) V = 2.62 (cc) Cp = 10.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.78 | 80.23 | 85.94 | 4.55 | -3.68 | 7.44 | 1.31 |

feldspar mass = 27.89 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -464047.68 (J) H = -383142.03 (J) S = 64.56 (J/K) V = 10.64 (cc) Cp = 34.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.08 | 33.94 | 2.99 |

quartz mass = 2.82 (gm) density = 2.55 (gm/cc)
SiO2
G = -46962.00 (J) H = -39187.85 (J) S = 6.20 (J/K) V = 1.10 (cc) Cp = 3.34 (J/K)

Total solids mass = 45.91 (gm) density = 2.85 (gm/cc)
G = -718139.12 (J) H = -588302.15 (J) S = 103.61 (J/K) V = 16.11 (cc) Cp = 54.80 (J/K)

Viscosity of the System: 7.59 (log 10 poise)

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1596143.79 (J) H = -1292679.85 (J) S = 242.16 (J/K) V = 38.22 (cc) Cp = 127.08 (J/K)

Oxygen delta moles = -0.00162334 delta grams = -0.051945
G = 460.32 (J) H = -51.38 (J) S = -0.41 (J/K) V = -169.14 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 970.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.15 COH = 1.77 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 50.86 (gm) density = 2.44 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -825550.79 (J) H = -663591.62 (J) S = 130.28 (J/K) V = 20.84 (cc) Cp = 68.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.01 | 1.22 | 12.32 | 0.58 | 0.00 | 2.28 | 0.22 | 0.43 | 0.00 | 0.00 | 3.43 | 3.24 | 2.97 | 0.32 | 1.99 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.02 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.89Mg0.98Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -108792.13 (J) H = -87412.18 (J) S = 17.20 (J/K) V = 2.29 (cc) Cp = 9.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.96 | 93.93 | 89.44 | 3.85 | -3.49 | 5.90 | 0.33 |

clinopyroxene mass = 7.01 (gm) density = 3.49 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.19Fe"0.88Mg0.83Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -94795.57 (J) H = -76049.32 (J) S = 15.08 (J/K) V = 2.01 (cc) Cp = 7.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.35 | 79.94 | 87.69 | 4.57 | -3.64 | 7.45 | 1.34 |

clinopyroxene mass = 0.65 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.43Mg0.59Fe'"0.07Ti0.04Al0.21Si1.85O6
G = -9498.79 (J) H = -7776.74 (J) S = 1.39 (J/K) V = 0.19 (cc) Cp = 0.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.19 | 18.69 | 42.84 | 8.32 | -0.92 | 7.79 | 5.09 |

feldspar mass = 29.49 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -489953.61 (J) H = -405426.11 (J) S = 67.99 (J/K) V = 11.26 (cc) Cp = 36.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.32 | 33.53 | 3.15 |

quartz mass = 3.92 (gm) density = 2.55 (gm/cc)
SiO2
G = -65106.15 (J) H = -54446.51 (J) S = 8.57 (J/K) V = 1.53 (cc) Cp = 4.64 (J/K)

Total solids mass = 49.08 (gm) density = 2.84 (gm/cc)
G = -768146.25 (J) H = -631110.86 (J) S = 110.23 (J/K) V = 17.28 (cc) Cp = 58.54 (J/K)

Viscosity of the System: 8.04 (log 10 poise)

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1593697.04 (J) H = -1294702.48 (J) S = 240.51 (J/K) V = 38.12 (cc) Cp = 126.56 (J/K)

Oxygen delta moles = -0.00168525 delta grams = -0.053926
G = 473.64 (J) H = -52.73 (J) S = -0.42 (J/K) V = -174.19 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 47.45 (gm) density = 2.43 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -769633.49 (J) H = -619826.34 (J) S = 121.48 (J/K) V = 19.49 (cc) Cp = 63.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.03 | 1.07 | 12.36 | 0.57 | 0.00 | 2.21 | 0.23 | 0.38 | 0.00 | 0.00 | 3.32 | 3.21 | 3.14 | 0.34 | 2.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.17 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.93Mg0.95Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -177031.30 (J) H = -142417.56 (J) S = 28.07 (J/K) V = 3.75 (cc) Cp = 15.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.65 | 94.19 | 92.72 | 3.92 | -3.60 | 6.10 | 0.32 |

clinopyroxene mass = 0.49 (gm) density = 3.50 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.91Mg0.80Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -6594.48 (J) H = -5297.02 (J) S = 1.05 (J/K) V = 0.14 (cc) Cp = 0.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.88 | 80.26 | 90.85 | 4.51 | -3.68 | 7.60 | 1.33 |

clinopyroxene mass = 2.33 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.44Mg0.58Fe'"0.07Ti0.03Al0.21Si1.85O6
G = -33874.53 (J) H = -27781.05 (J) S = 4.94 (J/K) V = 0.69 (cc) Cp = 2.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.83 | 18.64 | 44.45 | 7.86 | -1.01 | 8.05 | 5.18 |

feldspar mass = 31.09 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.03Na0.63Ca0.33Al1.33Si2.67O8
G = -515825.74 (J) H = -427775.08 (J) S = 71.40 (J/K) V = 11.87 (cc) Cp = 37.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.48 | 33.13 | 3.39 |

quartz mass = 5.19 (gm) density = 2.55 (gm/cc)
SiO2
G = -86110.77 (J) H = -72168.27 (J) S = 11.31 (J/K) V = 2.03 (cc) Cp = 6.14 (J/K)

rhm-oxide mass = 0.22 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.12Fe'"0.20Al0.11Ti0.84O3
G = -2235.22 (J) H = -1698.20 (J) S = 0.44 (J/K) V = 0.05 (cc) Cp = 0.21 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.67 | 9.89 | 70.01 | 2.79 | 5.64 |

Total solids mass = 52.50 (gm) density = 2.83 (gm/cc)
G = -821672.04 (J) H = -677137.18 (J) S = 117.21 (J/K) V = 18.52 (cc) Cp = 62.56 (J/K)

Viscosity of the System: 9.17 (log 10 poise)

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1591305.54 (J) H = -1296963.52 (J) S = 238.69 (J/K) V = 38.01 (cc) Cp = 126.01 (J/K)

Oxygen delta moles = -0.00167734 delta grams = -0.0536729
G = 467.20 (J) H = -51.88 (J) S = -0.42 (J/K) V = -171.97 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 44.46 (gm) density = 2.43 (gm/cc) viscosity = 5.99 (log 10 poise) (analysis in wt %)
G = -721009.87 (J) H = -581840.74 (J) S = 113.78 (J/K) V = 18.31 (cc) Cp = 59.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.04 | 1.00 | 12.42 | 0.54 | 0.00 | 2.07 | 0.24 | 0.36 | 0.00 | 0.00 | 3.22 | 3.17 | 3.31 | 0.36 | 2.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.56 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.94Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -181428.97 (J) H = -146274.32 (J) S = 28.74 (J/K) V = 3.85 (cc) Cp = 15.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.04 | 94.38 | 93.91 | 3.96 | -3.65 | 6.13 | 0.32 |

clinopyroxene mass = 2.88 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.44Mg0.57Fe'"0.07Ti0.03Al0.21Si1.85O6
G = -41690.58 (J) H = -34276.39 (J) S = 6.06 (J/K) V = 0.85 (cc) Cp = 3.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.45 | 17.95 | 44.37 | 7.91 | -0.96 | 7.98 | 5.29 |

feldspar mass = 32.45 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.04Na0.64Ca0.33Al1.33Si2.67O8
G = -537628.51 (J) H = -446832.77 (J) S = 74.23 (J/K) V = 12.39 (cc) Cp = 39.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.74 | 32.65 | 3.61 |

quartz mass = 6.25 (gm) density = 2.55 (gm/cc)
SiO2
G = -103671.25 (J) H = -87073.41 (J) S = 13.57 (J/K) V = 2.45 (cc) Cp = 7.39 (J/K)

rhm-oxide mass = 0.35 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.20Al0.11Ti0.85O3
G = -3483.68 (J) H = -2654.49 (J) S = 0.68 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.43 | 9.83 | 70.27 | 2.92 | 5.55 |

Total solids mass = 55.49 (gm) density = 2.83 (gm/cc)
G = -867902.98 (J) H = -717111.38 (J) S = 123.28 (J/K) V = 19.61 (cc) Cp = 66.02 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1588912.85 (J) H = -1298952.13 (J) S = 237.06 (J/K) V = 37.92 (cc) Cp = 125.48 (J/K)

Oxygen delta moles = -0.0017034 delta grams = -0.0545067
G = 470.19 (J) H = -52.08 (J) S = -0.43 (J/K) V = -173.23 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 41.76 (gm) density = 2.42 (gm/cc) viscosity = 5.99 (log 10 poise) (analysis in wt %)
G = -677242.09 (J) H = -547623.48 (J) S = 106.84 (J/K) V = 17.25 (cc) Cp = 55.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.03 | 0.93 | 12.49 | 0.51 | 0.00 | 1.93 | 0.25 | 0.33 | 0.00 | 0.00 | 3.13 | 3.13 | 3.47 | 0.39 | 2.42 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.55 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.93Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -180689.47 (J) H = -146014.08 (J) S = 28.58 (J/K) V = 3.84 (cc) Cp = 15.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.14 | 94.57 | 94.83 | 4.00 | -3.70 | 6.14 | 0.31 |

clinopyroxene mass = 3.28 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.44Mg0.56Fe'"0.07Ti0.04Al0.21Si1.85O6
G = -47467.73 (J) H = -39126.32 (J) S = 6.88 (J/K) V = 0.97 (cc) Cp = 3.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.26 | 17.25 | 44.13 | 7.99 | -0.92 | 7.89 | 5.40 |

feldspar mass = 33.69 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.04Na0.64Ca0.32Al1.32Si2.68O8
G = -557211.33 (J) H = -464122.04 (J) S = 76.73 (J/K) V = 12.86 (cc) Cp = 41.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.98 | 32.19 | 3.83 |

quartz mass = 7.21 (gm) density = 2.55 (gm/cc)
SiO2
G = -119395.77 (J) H = -100496.78 (J) S = 15.58 (J/K) V = 2.82 (cc) Cp = 8.52 (J/K)

rhm-oxide mass = 0.45 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.19Al0.11Ti0.85O3
G = -4528.15 (J) H = -3460.89 (J) S = 0.88 (J/K) V = 0.10 (cc) Cp = 0.43 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.24 | 9.74 | 70.50 | 3.05 | 5.47 |

Total solids mass = 58.18 (gm) density = 2.83 (gm/cc)
G = -909292.46 (J) H = -753220.12 (J) S = 128.65 (J/K) V = 20.59 (cc) Cp = 69.12 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1586534.55 (J) H = -1300843.60 (J) S = 235.50 (J/K) V = 37.84 (cc) Cp = 125.00 (J/K)

Oxygen delta moles = -0.00173242 delta grams = -0.0554353
G = 473.86 (J) H = -52.35 (J) S = -0.43 (J/K) V = -174.74 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 39.33 (gm) density = 2.42 (gm/cc) viscosity = 5.99 (log 10 poise) (analysis in wt %)
G = -637674.29 (J) H = -516660.70 (J) S = 100.58 (J/K) V = 16.28 (cc) Cp = 52.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.99 | 0.87 | 12.56 | 0.48 | 0.00 | 1.80 | 0.26 | 0.31 | 0.00 | 0.00 | 3.04 | 3.08 | 3.63 | 0.41 | 2.57 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.55 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.92Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -180014.24 (J) H = -145808.82 (J) S = 28.43 (J/K) V = 3.84 (cc) Cp = 15.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.16 | 94.75 | 95.68 | 4.04 | -3.76 | 6.15 | 0.31 |

clinopyroxene mass = 3.64 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.78Fe"0.44Mg0.56Fe'"0.07Ti0.04Al0.21Si1.85O6
G = -52592.28 (J) H = -43461.92 (J) S = 7.59 (J/K) V = 1.07 (cc) Cp = 4.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.07 | 16.59 | 43.86 | 8.08 | -0.89 | 7.79 | 5.50 |

feldspar mass = 34.81 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.04Na0.64Ca0.32Al1.32Si2.68O8
G = -574907.77 (J) H = -479909.49 (J) S = 78.96 (J/K) V = 13.29 (cc) Cp = 42.34 (J/K)
albite anorthite sanidine
64.19 31.76 4.05

quartz mass = 8.08 (gm) density = 2.55 (gm/cc)
SiO2
G = -133575.69 (J) H = -112674.12 (J) S = 17.37 (J/K) V = 3.16 (cc) Cp = 9.53 (J/K)

rhm-oxide mass = 0.54 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.19Al0.11Ti0.85O3
G = -5407.01 (J) H = -4145.33 (J) S = 1.05 (J/K) V = 0.12 (cc) Cp = 0.52 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.07 9.63 70.73 3.18 5.39

Total solids mass = 60.61 (gm) density = 2.82 (gm/cc)
G = -946496.99 (J) H = -785999.69 (J) S = 133.40 (J/K) V = 21.48 (cc) Cp = 71.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1584171.28 (J) H = -1302660.38 (J) S = 233.98 (J/K) V = 37.76 (cc) Cp = 124.55 (J/K)

Oxygen delta moles = -0.00176219 delta grams = -0.0563881
G = 477.59 (J) H = -52.62 (J) S = -0.44 (J/K) V = -176.28 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 37.12 (gm) density = 2.41 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -601701.53 (J) H = -488482.12 (J) S = 94.89 (J/K) V = 15.40 (cc) Cp = 49.71 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.93 0.82 12.63 0.45 0.00 1.67 0.27 0.29 0.00 0.00 2.96 3.03 3.79 0.44 2.72 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.54 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.92Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -179386.58 (J) H = -145644.55 (J) S = 28.28 (J/K) V = 3.83 (cc) Cp = 15.44 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-98.12 94.93 96.46 4.08 -3.81 6.15 0.30

clinopyroxene mass = 3.96 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.78Fe"0.44Mg0.55Fe'"0.07Ti0.04Al0.21Si1.85O6
G = -57165.46 (J) H = -47362.94 (J) S = 8.22 (J/K) V = 1.16 (cc) Cp = 4.41 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
19.90 15.95 43.55 8.18 -0.87 7.68 5.60

feldspar mass = 35.84 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.04Na0.64Ca0.31Al1.31Si2.69O8
G = -590978.87 (J) H = -494403.19 (J) S = 80.94 (J/K) V = 13.68 (cc) Cp = 43.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.38 | 31.34 | 4.28 |

quartz mass = 8.87 (gm) density = 2.55 (gm/cc)
SiO2
G = -146441.27 (J) H = -123791.63 (J) S = 18.98 (J/K) V = 3.47 (cc) Cp = 10.46 (J/K)

rhm-oxide mass = 0.62 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.19Al0.11Ti0.85O3
G = -6149.02 (J) H = -4728.83 (J) S = 1.19 (J/K) V = 0.13 (cc) Cp = 0.59 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.91 | 9.51 | 70.96 | 3.31 | 5.31 |

Total solids mass = 62.82 (gm) density = 2.82 (gm/cc)
G = -980121.20 (J) H = -815931.14 (J) S = 137.61 (J/K) V = 22.28 (cc) Cp = 74.43 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1581822.73 (J) H = -1304413.26 (J) S = 232.50 (J/K) V = 37.69 (cc) Cp = 124.14 (J/K)

Oxygen delta moles = -0.00179246 delta grams = -0.0573564
G = 481.32 (J) H = -52.89 (J) S = -0.45 (J/K) V = -177.82 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 35.10 (gm) density = 2.40 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -568825.96 (J) H = -462700.70 (J) S = 89.70 (J/K) V = 14.60 (cc) Cp = 47.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.85 | 0.76 | 12.71 | 0.42 | 0.00 | 1.55 | 0.28 | 0.27 | 0.00 | 0.00 | 2.89 | 2.97 | 3.95 | 0.46 | 2.88 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.54 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.97Mg0.91Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -178795.70 (J) H = -145512.08 (J) S = 28.13 (J/K) V = 3.82 (cc) Cp = 15.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.02 | 95.11 | 97.19 | 4.13 | -3.87 | 6.16 | 0.30 |

clinopyroxene mass = 4.24 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.79Fe"0.43Mg0.55Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -61268.52 (J) H = -50893.33 (J) S = 8.77 (J/K) V = 1.25 (cc) Cp = 4.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.72 | 15.34 | 43.22 | 8.30 | -0.85 | 7.57 | 5.70 |

feldspar mass = 36.78 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.05Na0.65Ca0.31Al1.31Si2.69O8
G = -605640.56 (J) H = -507775.21 (J) S = 82.72 (J/K) V = 14.04 (cc) Cp = 44.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.55 | 30.94 | 4.51 |

quartz mass = 9.59 (gm) density = 2.55 (gm/cc)
SiO2
G = -158180.91 (J) H = -134001.74 (J) S = 20.44 (J/K) V = 3.76 (cc) Cp = 11.30 (J/K)

rhm-oxide mass = 0.68 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.19Al0.10Ti0.85O3
G = -6777.01 (J) H = -5228.03 (J) S = 1.31 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.75 | 9.39 | 71.18 | 3.44 | 5.24 |

Total solids mass = 64.84 (gm) density = 2.82 (gm/cc)
G = -1010662.69 (J) H = -843410.38 (J) S = 141.36 (J/K) V = 23.02 (cc) Cp = 76.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1579488.65 (J) H = -1306111.08 (J) S = 231.06 (J/K) V = 37.62 (cc) Cp = 123.76 (J/K)

Oxygen delta moles = -0.001823 delta grams = -0.0583339
G = 484.97 (J) H = -53.14 (J) S = -0.45 (J/K) V = -179.33 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 900.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.09 COH = 1.60 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 33.25 (gm) density = 2.40 (gm/cc) viscosity = 5.97 (log 10 poise) (analysis in wt %)
G = -538633.80 (J) H = -438994.65 (J) S = 84.93 (J/K) V = 13.86 (cc) Cp = 44.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.75 | 0.71 | 12.79 | 0.40 | 0.00 | 1.44 | 0.30 | 0.26 | 0.00 | 0.00 | 2.82 | 2.91 | 4.10 | 0.49 | 3.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.54 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.91Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -178234.86 (J) H = -145405.53 (J) S = 27.98 (J/K) V = 3.82 (cc) Cp = 15.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.86 | 95.28 | 97.86 | 4.18 | -3.94 | 6.17 | 0.29 |

clinopyroxene mass = 4.50 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.79Fe"0.43Mg0.55Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -64967.35 (J) H = -54104.91 (J) S = 9.26 (J/K) V = 1.32 (cc) Cp = 5.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.55 | 14.74 | 42.87 | 8.42 | -0.84 | 7.46 | 5.80 |

feldspar mass = 37.65 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.05Na0.65Ca0.31Al1.31Si2.69O8
G = -619073.27 (J) H = -520169.39 (J) S = 84.31 (J/K) V = 14.38 (cc) Cp = 45.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.70 | 30.56 | 4.74 |

quartz mass = 10.26 (gm) density = 2.55 (gm/cc)
SiO2
G = -168950.35 (J) H = -143430.49 (J) S = 21.75 (J/K) V = 4.02 (cc) Cp = 12.07 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.19Al0.10Ti0.86O3
G = -7309.19 (J) H = -5656.23 (J) S = 1.41 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.61 | 9.26 | 71.41 | 3.56 | 5.17 |

Total solids mass = 66.69 (gm) density = 2.81 (gm/cc)
G = -1038535.01 (J) H = -868766.54 (J) S = 144.71 (J/K) V = 23.70 (cc) Cp = 78.83 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1577168.81 (J) H = -1307761.19 (J) S = 229.64 (J/K) V = 37.55 (cc) Cp = 123.40 (J/K)

Oxygen delta moles = -0.00185367 delta grams = -0.0593153
G = 488.50 (J) H = -53.37 (J) S = -0.46 (J/K) V = -180.81 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 31.55 (gm) density = 2.39 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -510777.86 (J) H = -417093.86 (J) S = 80.54 (J/K) V = 13.17 (cc) Cp = 42.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.63 | 0.67 | 12.88 | 0.37 | 0.00 | 1.34 | 0.31 | 0.24 | 0.00 | 0.00 | 2.75 | 2.85 | 4.25 | 0.51 | 3.20 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.54 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -177700.06 (J) H = -145321.28 (J) S = 27.84 (J/K) V = 3.82 (cc) Cp = 15.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.67 | 95.46 | 98.50 | 4.24 | -4.01 | 6.19 | 0.29 |

clinopyroxene mass = 4.74 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.80Fe"0.42Mg0.55Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -68315.92 (J) H = -57040.10 (J) S = 9.69 (J/K) V = 1.39 (cc) Cp = 5.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.37 | 14.17 | 42.50 | 8.56 | -0.84 | 7.35 | 5.89 |

feldspar mass = 38.46 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -631429.33 (J) H = -531707.16 (J) S = 85.73 (J/K) V = 14.69 (cc) Cp = 46.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.83 | 30.20 | 4.97 |

quartz mass = 10.87 (gm) density = 2.55 (gm/cc)
SiO2
G = -178879.58 (J) H = -152183.16 (J) S = 22.95 (J/K) V = 4.26 (cc) Cp = 12.79 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.18Al0.10Ti0.86O3
G = -7760.27 (J) H = -6024.15 (J) S = 1.49 (J/K) V = 0.17 (cc) Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.47 | 9.12 | 71.64 | 3.67 | 5.11 |

Total solids mass = 68.39 (gm) density = 2.81 (gm/cc)
G = -1064085.16 (J) H = -892275.86 (J) S = 147.71 (J/K) V = 24.32 (cc) Cp = 80.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1574863.02 (J) H = -1309369.72 (J) S = 228.25 (J/K) V = 37.50 (cc) Cp = 123.07 (J/K)

Oxygen delta moles = -0.00188435 delta grams = -0.060297
G = 491.90 (J) H = -53.59 (J) S = -0.47 (J/K) V = -182.23 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 880.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.07 COH = 1.54 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 29.96 (gm) density = 2.39 (gm/cc) viscosity = 5.94 (log 10 poise) (analysis in wt %)
G = -484964.20 (J) H = -396769.45 (J) S = 76.48 (J/K) V = 12.54 (cc) Cp = 40.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.48 | 0.62 | 12.97 | 0.35 | 0.00 | 1.24 | 0.32 | 0.23 | 0.00 | 0.00 | 2.69 | 2.79 | 4.40 | 0.54 | 3.37 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.53 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -177189.16 (J) H = -145257.33 (J) S = 27.69 (J/K) V = 3.81 (cc) Cp = 15.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.43 | 95.63 | 99.09 | 4.30 | -4.08 | 6.20 | 0.28 |

clinopyroxene mass = 4.95 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.80Fe"0.42Mg0.54Fe'"0.06Ti0.04Al0.22Si1.85O6
G = -71358.88 (J) H = -59733.95 (J) S = 10.08 (J/K) V = 1.46 (cc) Cp = 5.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.18 | 13.62 | 42.11 | 8.71 | -0.84 | 7.24 | 5.98 |

feldspar mass = 39.22 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -642838.56 (J) H = -542492.10 (J) S = 87.02 (J/K) V = 14.97 (cc) Cp = 47.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.94 | 29.85 | 5.21 |

quartz mass = 11.45 (gm) density = 2.55 (gm/cc)
SiO2
G = -188078.14 (J) H = -160348.53 (J) S = 24.05 (J/K) V = 4.48 (cc) Cp = 13.45 (J/K)

rhm-oxide mass = 0.83 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.18Al0.10Ti0.86O3
G = -8142.17 (J) H = -6340.48 (J) S = 1.56 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.33 | 8.98 | 71.86 | 3.78 | 5.05 |

Total solids mass = 69.97 (gm) density = 2.81 (gm/cc)
G = -1087606.91 (J) H = -914172.39 (J) S = 150.40 (J/K) V = 24.90 (cc) Cp = 82.54 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1572571.11 (J) H = -1310941.84 (J) S = 226.88 (J/K) V = 37.44 (cc) Cp = 122.75 (J/K)

Oxygen delta moles = -0.00191494 delta grams = -0.0612759
G = 495.12 (J) H = -53.78 (J) S = -0.48 (J/K) V = -183.60 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 28.47 (gm) density = 2.39 (gm/cc) viscosity = 5.93 (log 10 poise) (analysis in wt %)
G = -460641.19 (J) H = -377575.15 (J) S = 72.66 (J/K) V = 11.94 (cc) Cp = 38.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.34 | 0.58 | 13.08 | 0.33 | 0.00 | 1.15 | 0.33 | 0.21 | 0.00 | 0.00 | 2.61 | 2.73 | 4.54 | 0.55 | 3.55 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.54 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -176724.06 (J) H = -145231.55 (J) S = 27.55 (J/K) V = 3.81 (cc) Cp = 15.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.17 | 95.80 | 99.65 | 4.37 | -4.15 | 6.22 | 0.28 |

clinopyroxene mass = 5.14 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.81Fe"0.42Mg0.54Fe'"0.06Ti0.04Al0.22Si1.85O6
G = -74092.81 (J) H = -62181.60 (J) S = 10.42 (J/K) V = 1.51 (cc) Cp = 5.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.99 | 13.08 | 41.70 | 8.87 | -0.84 | 7.12 | 6.07 |

feldspar mass = 39.92 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -653452.62 (J) H = -552646.96 (J) S = 88.18 (J/K) V = 15.24 (cc) Cp = 48.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.02 | 29.52 | 5.46 |

quartz mass = 11.99 (gm) density = 2.55 (gm/cc)
SiO2
G = -196704.46 (J) H = -168057.95 (J) S = 25.06 (J/K) V = 4.69 (cc) Cp = 14.07 (J/K)

rhm-oxide mass = 0.86 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.18Al0.10Ti0.86O3
G = -8469.07 (J) H = -6615.80 (J) S = 1.62 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.20 | 8.83 | 72.09 | 3.89 | 4.99 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -208.54 (J) H = -174.38 (J) S = 0.03 (J/K) V = 0.00 (cc) Cp = 0.02 (J/K)

Total solids mass = 71.46 (gm) density = 2.81 (gm/cc)
G = -1109651.56 (J) H = -934908.25 (J) S = 152.86 (J/K) V = 25.45 (cc) Cp = 84.22 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1570292.75 (J) H = -1312483.40 (J) S = 225.53 (J/K) V = 37.38 (cc) Cp = 122.45 (J/K)

Oxygen delta moles = -0.00194573 delta grams = -0.0622611
G = 498.25 (J) H = -53.95 (J) S = -0.48 (J/K) V = -184.93 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 860.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.06 COH = 1.48 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 27.08 (gm) density = 2.38 (gm/cc) viscosity = 5.91 (log 10 poise) (analysis in wt %)
G = -437952.57 (J) H = -359641.01 (J) S = 69.11 (J/K) V = 11.38 (cc) Cp = 36.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.18 | 0.54 | 13.18 | 0.31 | 0.00 | 1.06 | 0.35 | 0.20 | 0.00 | 0.00 | 2.54 | 2.66 | 4.68 | 0.56 | 3.73 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.54 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.89Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -176278.68 (J) H = -145222.30 (J) S = 27.41 (J/K) V = 3.80 (cc) Cp = 15.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.87 | 95.97 | 100.18 | 4.44 | -4.23 | 6.25 | 0.27 |

clinopyroxene mass = 5.32 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.81Fe"0.41Mg0.54Fe'"0.06Ti0.04Al0.22Si1.85O6
G = -76593.45 (J) H = -64444.68 (J) S = 10.72 (J/K) V = 1.56 (cc) Cp = 5.89 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
24.78 12.57 41.28 9.05 -0.85 7.01 6.16

feldspar mass = 40.59 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -663316.63 (J) H = -562205.72 (J) S = 89.23 (J/K) V = 15.50 (cc) Cp = 49.07 (J/K)
albite anorthite sanidine
65.09 29.20 5.71

quartz mass = 12.49 (gm) density = 2.55 (gm/cc)
SiO2
G = -204755.00 (J) H = -175305.24 (J) S = 25.99 (J/K) V = 4.89 (cc) Cp = 14.65 (J/K)

rhm-oxide mass = 0.89 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.17Al0.10Ti0.86O3
G = -8743.35 (J) H = -6851.55 (J) S = 1.67 (J/K) V = 0.19 (cc) Cp = 0.83 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.06 8.68 72.31 4.00 4.94

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -388.39 (J) H = -325.53 (J) S = 0.06 (J/K) V = 0.01 (cc) Cp = 0.03 (J/K)

Total solids mass = 72.85 (gm) density = 2.81 (gm/cc)
G = -1130075.51 (J) H = -954355.02 (J) S = 155.07 (J/K) V = 25.96 (cc) Cp = 85.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1568028.07 (J) H = -1313996.03 (J) S = 224.18 (J/K) V = 37.33 (cc) Cp = 122.16 (J/K)

Oxygen delta moles = -0.00197624 delta grams = -0.0632374
G = 501.16 (J) H = -54.10 (J) S = -0.49 (J/K) V = -186.19 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 850.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.05 COH = 1.46 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 25.78 (gm) density = 2.38 (gm/cc) viscosity = 5.88 (log 10 poise) (analysis in wt %)
G = -416711.93 (J) H = -342821.79 (J) S = 65.79 (J/K) V = 10.85 (cc) Cp = 34.66 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.00 0.51 13.29 0.29 0.00 0.98 0.36 0.19 0.00 0.00 2.47 2.60 4.82 0.57 3.91 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.54 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.01Mg0.89Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -175853.11 (J) H = -145229.46 (J) S = 27.27 (J/K) V = 3.80 (cc) Cp = 15.28 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.56 96.14 100.68 4.51 -4.31 6.27 0.26

clinopyroxene mass = 5.48 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.82Fe"0.41Mg0.54Fe'"0.06Ti0.04Al0.22Si1.85O6
G = -78889.25 (J) H = -66545.61 (J) S = 10.99 (J/K) V = 1.61 (cc) Cp = 6.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.57 | 12.06 | 40.85 | 9.24 | -0.86 | 6.89 | 6.25 |

feldspar mass = 41.21 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -672517.47 (J) H = -571237.94 (J) S = 90.17 (J/K) V = 15.74 (cc) Cp = 49.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.14 | 28.89 | 5.97 |

quartz mass = 12.97 (gm) density = 2.55 (gm/cc)
SiO2
G = -212300.02 (J) H = -182147.50 (J) S = 26.85 (J/K) V = 5.08 (cc) Cp = 15.19 (J/K)

rhm-oxide mass = 0.92 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.17Al0.10Ti0.87O3
G = -8971.58 (J) H = -7052.51 (J) S = 1.71 (J/K) V = 0.20 (cc) Cp = 0.86 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.94 | 8.53 | 72.54 | 4.10 | 4.89 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -533.60 (J) H = -448.29 (J) S = 0.08 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 74.15 (gm) density = 2.81 (gm/cc)
G = -1149065.03 (J) H = -972661.30 (J) S = 157.06 (J/K) V = 26.44 (cc) Cp = 87.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1565776.96 (J) H = -1315483.09 (J) S = 222.85 (J/K) V = 37.28 (cc) Cp = 121.89 (J/K)

Oxygen delta moles = -0.00200643 delta grams = -0.0642034
G = 503.84 (J) H = -54.22 (J) S = -0.50 (J/K) V = -187.36 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 24.56 (gm) density = 2.37 (gm/cc) viscosity = 5.86 (log 10 poise) (analysis in wt %)
G = -396743.64 (J) H = -326979.63 (J) S = 62.67 (J/K) V = 10.35 (cc) Cp = 33.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.79 | 0.47 | 13.41 | 0.27 | 0.00 | 0.91 | 0.38 | 0.18 | 0.00 | 0.00 | 2.42 | 2.53 | 4.96 | 0.58 | 4.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.54 (gm) density = 3.57 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.01Mg0.88Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -175448.89 (J) H = -145254.22 (J) S = 27.13 (J/K) V = 3.80 (cc) Cp = 15.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.22 | 96.31 | 101.16 | 4.59 | -4.40 | 6.31 | 0.26 |

clinopyroxene mass = 5.63 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.82Fe"0.40Mg0.54Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -81002.83 (J) H = -68502.12 (J) S = 11.23 (J/K) V = 1.65 (cc) Cp = 6.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.34 | 11.57 | 40.41 | 9.44 | -0.87 | 6.78 | 6.33 |

feldspar mass = 41.80 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -681133.99 (J) H = -579806.98 (J) S = 91.03 (J/K) V = 15.96 (cc) Cp = 50.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.17 | 28.59 | 6.23 |

quartz mass = 13.42 (gm) density = 2.55 (gm/cc)
SiO2
G = -219403.62 (J) H = -188637.06 (J) S = 27.64 (J/K) V = 5.26 (cc) Cp = 15.70 (J/K)

rhm-oxide mass = 0.94 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.17Al0.10Ti0.87O3
G = -9159.32 (J) H = -7222.71 (J) S = 1.74 (J/K) V = 0.20 (cc) Cp = 0.87 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.81 | 8.38 | 72.78 | 4.19 | 4.85 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -647.04 (J) H = -544.87 (J) S = 0.09 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

Total solids mass = 75.37 (gm) density = 2.80 (gm/cc)
G = -1166795.68 (J) H = -989967.96 (J) S = 158.85 (J/K) V = 26.88 (cc) Cp = 88.59 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.68 (gm/cc)
G = -1563539.32 (J) H = -1316947.59 (J) S = 221.53 (J/K) V = 37.24 (cc) Cp = 121.64 (J/K)

Oxygen delta moles = -0.00203628 delta grams = -0.0651587
G = 506.30 (J) H = -54.30 (J) S = -0.50 (J/K) V = -188.46 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 23.41 (gm) density = 2.37 (gm/cc) viscosity = 5.82 (log 10 poise) (analysis in wt %)
G = -377892.13 (J) H = -311992.04 (J) S = 59.74 (J/K) V = 9.88 (cc) Cp = 31.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

69.55 0.44 13.52 0.26 0.00 0.84 0.39 0.17 0.00 0.00 2.37 2.47 5.09 0.60 4.31 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.54 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.88Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -175067.87 (J) H = -145298.05 (J) S = 26.99 (J/K) V = 3.79 (cc) Cp = 15.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.87 | 96.47 | 101.62 | 4.68 | -4.50 | 6.35 | 0.25 |

clinopyroxene mass = 5.76 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.82Fe"0.40Mg0.54Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -82953.57 (J) H = -70329.43 (J) S = 11.44 (J/K) V = 1.69 (cc) Cp = 6.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.09 | 11.10 | 39.96 | 9.67 | -0.89 | 6.66 | 6.42 |

feldspar mass = 42.36 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -689237.24 (J) H = -587970.14 (J) S = 91.80 (J/K) V = 16.17 (cc) Cp = 51.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.18 | 28.31 | 6.51 |

quartz mass = 13.85 (gm) density = 2.55 (gm/cc)
SiO2
G = -226122.41 (J) H = -194820.25 (J) S = 28.38 (J/K) V = 5.42 (cc) Cp = 16.19 (J/K)

rhm-oxide mass = 0.95 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.16Al0.10Ti0.87O3
G = -9311.07 (J) H = -7365.41 (J) S = 1.76 (J/K) V = 0.21 (cc) Cp = 0.89 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.68 | 8.22 | 73.01 | 4.28 | 4.80 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -730.81 (J) H = -616.85 (J) S = 0.10 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 76.53 (gm) density = 2.80 (gm/cc)
G = -1183422.97 (J) H = -1006400.12 (J) S = 160.47 (J/K) V = 27.31 (cc) Cp = 89.88 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1561315.10 (J) H = -1318392.17 (J) S = 220.21 (J/K) V = 37.19 (cc) Cp = 121.40 (J/K)

Oxygen delta moles = -0.0020658 delta grams = -0.066103
G = 508.53 (J) H = -54.36 (J) S = -0.51 (J/K) V = -189.47 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 820.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.02 COH = 1.37 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 22.31 (gm) density = 2.36 (gm/cc) viscosity = 5.79 (log 10 poise) (analysis in wt %)
G = -360017.58 (J) H = -297748.49 (J) S = 56.96 (J/K) V = 9.44 (cc) Cp = 30.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.28 | 0.41 | 13.64 | 0.24 | 0.00 | 0.78 | 0.41 | 0.16 | 0.00 | 0.00 | 2.32 | 2.40 | 5.22 | 0.62 | 4.52 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.55 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.88Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -174712.30 (J) H = -145362.78 (J) S = 26.85 (J/K) V = 3.79 (cc) Cp = 15.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.50 | 96.63 | 102.05 | 4.77 | -4.60 | 6.39 | 0.25 |

clinopyroxene mass = 5.89 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.39Mg0.54Fe'"0.06Ti0.05Al0.23Si1.84O6
G = -84758.19 (J) H = -72040.63 (J) S = 11.63 (J/K) V = 1.73 (cc) Cp = 6.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.82 | 10.63 | 39.50 | 9.91 | -0.90 | 6.55 | 6.50 |

feldspar mass = 42.90 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -696892.34 (J) H = -595780.15 (J) S = 92.50 (J/K) V = 16.38 (cc) Cp = 51.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.18 | 28.03 | 6.79 |

quartz mass = 14.26 (gm) density = 2.55 (gm/cc)
SiO2
G = -232507.12 (J) H = -200738.74 (J) S = 29.06 (J/K) V = 5.58 (cc) Cp = 16.65 (J/K)

rhm-oxide mass = 0.97 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.16Al0.10Ti0.87O3
G = -9430.42 (J) H = -7483.18 (J) S = 1.78 (J/K) V = 0.21 (cc) Cp = 0.90 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.55 | 8.07 | 73.26 | 4.36 | 4.76 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -786.27 (J) H = -665.20 (J) S = 0.11 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 77.62 (gm) density = 2.80 (gm/cc)
G = -1199086.64 (J) H = -1022070.69 (J) S = 161.93 (J/K) V = 27.71 (cc) Cp = 91.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1559104.23 (J) H = -1319819.18 (J) S = 218.89 (J/K) V = 37.15 (cc) Cp = 121.19 (J/K)

Oxygen delta moles = -0.00209497 delta grams = -0.0670364
G = 510.54 (J) H = -54.39 (J) S = -0.52 (J/K) V = -190.41 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW

= 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 21.22 (gm) density = 2.36 (gm/cc) viscosity = 5.73 (log 10 poise) (analysis in wt %)
G = -342176.09 (J) H = -283438.74 (J) S = 54.23 (J/K) V = 8.99 (cc) Cp = 28.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.05 | 0.38 | 13.67 | 0.22 | 0.00 | 0.71 | 0.42 | 0.16 | 0.00 | 0.00 | 2.28 | 2.40 | 5.32 | 0.65 | 4.75 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.00 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -13371.95 (J) H = -11310.10 (J) S = 1.90 (J/K) V = 0.25 (cc) Cp = 1.07 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.79 | 18.19 | 22.03 |

orthopyroxene mass = 12.84 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.89Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -165578.76 (J) H = -138163.31 (J) S = 25.31 (J/K) V = 3.59 (cc) Cp = 14.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.76 | 96.74 | 101.36 | 4.74 | -4.57 | 6.25 | 0.24 |

clinopyroxene mass = 6.12 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.38Mg0.54Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -88142.33 (J) H = -75124.53 (J) S = 12.02 (J/K) V = 1.80 (cc) Cp = 6.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.48 | 10.15 | 38.39 | 9.99 | -0.86 | 6.24 | 6.61 |

feldspar mass = 42.93 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.66Ca0.27Al1.27Si2.73O8
G = -696334.47 (J) H = -596537.82 (J) S = 92.14 (J/K) V = 16.40 (cc) Cp = 51.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.61 | 27.15 | 7.24 |

quartz mass = 14.80 (gm) density = 2.55 (gm/cc)
SiO2
G = -240956.55 (J) H = -208466.02 (J) S = 30.00 (J/K) V = 5.79 (cc) Cp = 17.26 (J/K)

rhm-oxide mass = 0.98 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.16Al0.09Ti0.87O3
G = -9509.29 (J) H = -7570.98 (J) S = 1.79 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.62 | 7.82 | 73.40 | 4.48 | 4.68 |

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -822.16 (J) H = -697.17 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 78.71 (gm) density = 2.80 (gm/cc)
G = -1214715.52 (J) H = -1037869.94 (J) S = 163.27 (J/K) V = 28.07 (cc) Cp = 92.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1556891.60 (J) H = -1321308.67 (J) S = 217.50 (J/K) V = 37.06 (cc) Cp = 120.94 (J/K)

Oxygen delta moles = -0.00215302 delta grams = -0.068894
G = 519.38 (J) H = -55.14 (J) S = -0.53 (J/K) V = -193.89 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 20.11 (gm) density = 2.35 (gm/cc) viscosity = 5.64 (log 10 poise) (analysis in wt %)
G = -324044.32 (J) H = -268785.35 (J) S = 51.49 (J/K) V = 8.54 (cc) Cp = 27.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.81 | 0.35 | 13.59 | 0.21 | 0.00 | 0.65 | 0.46 | 0.15 | 0.00 | 0.00 | 2.24 | 2.45 | 5.40 | 0.68 | 5.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.44 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -32714.13 (J) H = -27735.92 (J) S = 4.64 (J/K) V = 0.62 (cc) Cp = 2.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.73 | 18.12 | 22.15 |

orthopyroxene mass = 11.98 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -154747.93 (J) H = -129517.16 (J) S = 23.51 (J/K) V = 3.36 (cc) Cp = 13.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.47 | 96.82 | 100.26 | 4.60 | -4.45 | 5.99 | 0.25 |

clinopyroxene mass = 5.87 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.37Mg0.55Fe'"0.05Ti0.05Al0.22Si1.85O6
G = -84783.94 (J) H = -72465.87 (J) S = 11.48 (J/K) V = 1.73 (cc) Cp = 6.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.49 | 9.72 | 37.12 | 9.85 | -0.77 | 5.83 | 6.75 |

clinopyroxene mass = 0.61 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.29Mg0.30Fe'"0.05Ti0.39Al0.74Si1.24O6
G = -8781.79 (J) H = -7540.31 (J) S = 1.16 (J/K) V = 0.17 (cc) Cp = 0.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.23 | 1.89 | 28.94 | 70.14 | 7.57 | -2.20 | 5.89 |

feldspar mass = 42.58 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.26Al1.26Si2.74O8
G = -689524.54 (J) H = -591889.08 (J) S = 90.98 (J/K) V = 16.28 (cc) Cp = 51.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.36 | 25.75 | 7.89 |

quartz mass = 15.44 (gm) density = 2.55 (gm/cc)
SiO2
G = -251117.64 (J) H = -217707.02 (J) S = 31.13 (J/K) V = 6.04 (cc) Cp = 17.99 (J/K)

rhm-oxide mass = 0.84 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.10Fe'"0.15Al0.09Ti0.88O3
G = -8123.92 (J) H = -6489.64 (J) S = 1.52 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.76 | 7.57 | 73.38 | 4.73 | 4.56 |

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -836.47 (J) H = -710.95 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 79.82 (gm) density = 2.81 (gm/cc)
G = -1230630.36 (J) H = -1054055.94 (J) S = 164.54 (J/K) V = 28.40 (cc) Cp = 93.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1554674.68 (J) H = -1322841.28 (J) S = 216.03 (J/K) V = 36.94 (cc) Cp = 120.67 (J/K)

Oxygen delta moles = -0.00224692 delta grams = -0.0718988
G = 536.50 (J) H = -56.76 (J) S = -0.55 (J/K) V = -200.48 (cc) Cp = -0.08 (J/K)

**********_____**********
Title: f6i2m2

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 18.89 (gm) density = 2.35 (gm/cc) viscosity = 5.49 (log 10 poise) (analysis in wt %)
G = -304110.95 (J) H = -252502.44 (J) S = 48.54 (J/K) V = 8.04 (cc) Cp = 25.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.52 | 0.31 | 13.45 | 0.20 | 0.00 | 0.60 | 0.53 | 0.15 | 0.00 | 0.00 | 2.23 | 2.56 | 5.39 | 0.73 | 5.34 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.47 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -46330.55 (J) H = -39370.44 (J) S = 6.55 (J/K) V = 0.88 (cc) Cp = 3.71 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.88 | 18.08 | 22.03 |

orthopyroxene mass = 11.76 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.91Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -151828.04 (J) H = -127420.59 (J) S = 22.96 (J/K) V = 3.30 (cc) Cp = 13.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.00 | 96.93 | 99.92 | 4.47 | -4.33 | 5.77 | 0.25 |

clinopyroxene mass = 4.64 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.36Mg0.56Fe'"0.05Ti0.04Al0.22Si1.86O6
G = -67058.41 (J) H = -57464.51 (J) S = 9.02 (J/K) V = 1.37 (cc) Cp = 5.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.95 | 9.38 | 36.36 | 9.54 | -0.65 | 5.49 | 6.93 |

clinopyroxene mass = 2.33 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.29Mg0.30Fe'"0.05Ti0.39Al0.74Si1.24O6
G = -33629.62 (J) H = -28944.58 (J) S = 4.41 (J/K) V = 0.65 (cc) Cp = 2.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.24 | 1.79 | 28.63 | 70.62 | 7.69 | -2.58 | 6.08 |

feldspar mass = 42.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.67Ca0.24Al1.24Si2.76O8
G = -678981.94 (J) H = -584003.26 (J) S = 89.34 (J/K) V = 16.07 (cc) Cp = 50.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.21 | 24.24 | 8.54 |

feldspar mass = 0.22 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -3383.54 (J) H = -2902.95 (J) S = 0.45 (J/K) V = 0.09 (cc) Cp = 0.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.85 | 1.96 | 69.19 |

quartz mass = 16.14 (gm) density = 2.55 (gm/cc)
SiO2
G = -262227.86 (J) H = -227808.43 (J) S = 32.37 (J/K) V = 6.32 (cc) Cp = 18.78 (J/K)

rhm-oxide mass = 0.42 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.10Fe'"0.15Al0.09Ti0.88O3
G = -4067.44 (J) H = -3259.24 (J) S = 0.76 (J/K) V = 0.09 (cc) Cp = 0.39 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.78 | 7.42 | 73.20 | 5.17 | 4.42 |

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -837.39 (J) H = -713.37 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 81.04 (gm) density = 2.82 (gm/cc)
G = -1248344.79 (J) H = -1071887.39 (J) S = 165.98 (J/K) V = 28.78 (cc) Cp = 94.85 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.71 (gm/cc)
G = -1552455.74 (J) H = -1324389.83 (J) S = 214.52 (J/K) V = 36.82 (cc) Cp = 120.43 (J/K)

Oxygen delta moles = -0.00237319 delta grams = -0.0759391
G = 560.81 (J) H = -59.11 (J) S = -0.58 (J/K) V = -209.77 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 780.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.02 COH = 1.24
IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 17.17 (gm) density = 2.34 (gm/cc) viscosity = 5.22 (log 10 poise) (analysis in wt %)
G = -276523.54 (J) H = -229599.83 (J) S = 44.56 (J/K) V = 7.34 (cc) Cp = 23.34 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.08 0.27 13.20 0.20 0.00 0.59 0.65 0.14 0.00 0.00 2.26 2.81 5.14 0.79 5.87 0.00 0.00 0.00 0.00

garnet mass = 4.45 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -59325.90 (J) H = -50529.33 (J) S = 8.35 (J/K) V = 1.12 (cc) Cp = 4.76 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.02 | 18.02 | 21.95 |

orthopyroxene mass = 11.58 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.92Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -149532.89 (J) H = -125840.34 (J) S = 22.50 (J/K) V = 3.25 (cc) Cp = 13.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.43 | 97.02 | 99.47 | 4.35 | -4.21 | 5.55 | 0.25 |

clinopyroxene mass = 3.37 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.36Mg0.57Fe'"0.05Ti0.04Al0.22Si1.86O6
G = -48734.81 (J) H = -41871.09 (J) S = 6.52 (J/K) V = 0.99 (cc) Cp = 3.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.45 | 9.05 | 35.53 | 9.23 | -0.54 | 5.15 | 7.13 |

clinopyroxene mass = 4.05 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.28Mg0.31Fe'"0.05Ti0.39Al0.74Si1.24O6
G = -58494.29 (J) H = -50465.77 (J) S = 7.62 (J/K) V = 1.13 (cc) Cp = 4.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.21 | 1.69 | 28.28 | 71.08 | 7.82 | -2.96 | 6.30 |

feldspar mass = 40.69 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.68Ca0.23Al1.23Si2.77O8
G = -656881.36 (J) H = -566174.84 (J) S = 86.13 (J/K) V = 15.58 (cc) Cp = 49.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.32 | 23.21 | 8.47 |

feldspar mass = 1.56 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -24324.10 (J) H = -20915.26 (J) S = 3.24 (J/K) V = 0.61 (cc) Cp = 1.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.87 | 1.81 | 69.32 |

quartz mass = 16.98 (gm) density = 2.55 (gm/cc)
SiO2
G = -275551.95 (J) H = -239876.22 (J) S = 33.88 (J/K) V = 6.65 (cc) Cp = 19.74 (J/K)

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -884.82 (J) H = -755.50 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

Total solids mass = 82.75 (gm) density = 2.82 (gm/cc)
G = -1273730.12 (J) H = -1096428.36 (J) S = 168.35 (J/K) V = 29.36 (cc) Cp = 96.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.72 (gm/cc)
G = -1550253.66 (J) H = -1326028.20 (J) S = 212.91 (J/K) V = 36.71 (cc) Cp = 120.15 (J/K)

Oxygen delta moles = -0.00249742 delta grams = -0.0799146
G = 584.04 (J) H = -61.33 (J) S = -0.61 (J/K) V = -218.68 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 15.57 (gm) density = 2.33 (gm/cc) viscosity = 4.94 (log 10 poise) (analysis in wt %)
G = -250945.57 (J) H = -208341.49 (J) S = 40.84 (J/K) V = 6.69 (cc) Cp = 21.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.51 | 0.23 | 13.03 | 0.19 | 0.00 | 0.56 | 0.71 | 0.14 | 0.00 | 0.00 | 2.31 | 3.06 | 4.91 | 0.87 | 6.48 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.83 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -77724.47 (J) H = -66359.74 (J) S = 10.89 (J/K) V = 1.47 (cc) Cp = 6.23 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.83 | 17.94 | 22.23 |

orthopyroxene mass = 10.60 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.94Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -137267.67 (J) H = -115882.41 (J) S = 20.50 (J/K) V = 2.98 (cc) Cp = 11.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.63 | 97.09 | 97.86 | 4.22 | -4.09 | 5.30 | 0.25 |

clinopyroxene mass = 3.56 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.34Mg0.58Fe'"0.04Ti0.04Al0.21Si1.87O6
G = -51661.91 (J) H = -44512.81 (J) S = 6.85 (J/K) V = 1.05 (cc) Cp = 3.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.81 | 8.70 | 34.00 | 8.97 | -0.55 | 4.83 | 7.26 |

clinopyroxene mass = 4.08 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.27Mg0.31Fe'"0.05Ti0.40Al0.75Si1.24O6
G = -58933.83 (J) H = -50975.00 (J) S = 7.63 (J/K) V = 1.14 (cc) Cp = 4.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.89 | 1.60 | 27.50 | 71.83 | 7.83 | -3.32 | 6.44 |

feldspar mass = 39.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -640443.16 (J) H = -553179.19 (J) S = 83.65 (J/K) V = 15.21 (cc) Cp = 48.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.20 | 22.50 | 8.30 |

feldspar mass = 2.76 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.02Al1.02Si2.98O8
G = -42988.86 (J) H = -37046.04 (J) S = 5.70 (J/K) V = 1.09 (cc) Cp = 3.25 (J/K)

albite anorthite sanidine
28.65 1.67 69.67

quartz mass = 17.73 (gm) density = 2.55 (gm/cc)
SiO2
G = -287248.07 (J) H = -250570.86 (J) S = 35.16 (J/K) V = 6.94 (cc) Cp = 20.58 (J/K)

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -888.75 (J) H = -760.59 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

Total solids mass = 84.34 (gm) density = 2.82 (gm/cc)
G = -1297156.72 (J) H = -1119286.63 (J) S = 170.51 (J/K) V = 29.90 (cc) Cp = 98.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.73 (gm/cc)
G = -1548102.29 (J) H = -1327628.12 (J) S = 211.35 (J/K) V = 36.60 (cc) Cp = 119.92 (J/K)

Oxygen delta moles = -0.00255496 delta grams = -0.0817555
G = 591.23 (J) H = -61.85 (J) S = -0.63 (J/K) V = -221.59 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 13.27 (gm) density = 2.31 (gm/cc) viscosity = 4.55 (log 10 poise) (analysis in wt %)
G = -213812.07 (J) H = -177313.43 (J) S = 35.33 (J/K) V = 5.74 (cc) Cp = 18.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.77 | 0.19 | 12.59 | 0.20 | 0.00 | 0.57 | 0.84 | 0.14 | 0.00 | 0.00 | 2.40 | 3.49 | 4.55 | 0.98 | 7.26 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.12 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.22)3Al2Si3O12
G = -107882.93 (J) H = -92298.39 (J) S = 15.08 (J/K) V = 2.05 (cc) Cp = 8.66 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.56 | 17.92 | 21.52 |

orthopyroxene mass = 8.15 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.92Fe'''0.01Ti0.00Al0.10Si1.95O6
G = -104953.26 (J) H = -88781.40 (J) S = 15.65 (J/K) V = 2.29 (cc) Cp = 9.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.23 | 97.24 | 99.44 | 4.11 | -3.99 | 5.17 | 0.25 |

clinopyroxene mass = 3.82 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.34Mg0.58Fe'''0.04Ti0.04Al0.21Si1.87O6
G = -55368.49 (J) H = -47806.13 (J) S = 7.32 (J/K) V = 1.13 (cc) Cp = 4.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.74 | 8.44 | 34.37 | 8.60 | -0.22 | 4.50 | 7.58 |

clinopyroxene mass = 4.12 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.28Mg0.31Fe'"0.04Ti0.40Al0.75Si1.24O6
G = -59427.60 (J) H = -51507.38 (J) S = 7.67 (J/K) V = 1.15 (cc) Cp = 4.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.39 | 1.52 | 27.91 | 71.75 | 8.18 | -3.74 | 6.78 |

biotite mass = 1.06 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -16647.98 (J) H = -14294.37 (J) S = 2.28 (J/K) V = 0.38 (cc) Cp = 1.33 (J/K)

| annite | phlogopite |
|---|---|
| 5.51 | 94.49 |

feldspar mass = 38.81 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -624875.59 (J) H = -540838.95 (J) S = 81.34 (J/K) V = 14.87 (cc) Cp = 47.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.56 | 21.11 | 8.32 |

feldspar mass = 3.21 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.02Al1.02Si2.98O8
G = -50016.90 (J) H = -43196.90 (J) S = 6.60 (J/K) V = 1.26 (cc) Cp = 3.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.87 | 1.53 | 69.60 |

quartz mass = 19.27 (gm) density = 2.55 (gm/cc)
SiO2
G = -311924.50 (J) H = -272652.58 (J) S = 38.01 (J/K) V = 7.55 (cc) Cp = 22.34 (J/K)

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1071.49 (J) H = -919.07 (J) S = 0.15 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 86.65 (gm) density = 2.82 (gm/cc)
G = -1332168.74 (J) H = -1152295.18 (J) S = 174.10 (J/K) V = 30.71 (cc) Cp = 101.34 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.74 (gm/cc)
G = -1545980.80 (J) H = -1329608.60 (J) S = 209.43 (J/K) V = 36.44 (cc) Cp = 119.58 (J/K)

Oxygen delta moles = -0.00258682 delta grams = -0.082775
G = 592.27 (J) H = -61.71 (J) S = -0.63 (J/K) V = -222.21 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 10.05 (gm) density = 2.29 (gm/cc) viscosity = 4.06 (log 10 poise) (analysis in wt %)
G = -162129.04 (J) H = -134139.48 (J) S = 27.36 (J/K) V = 4.39 (cc) Cp = 13.94 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.90 0.15 11.85 0.24 0.00 0.64 0.84 0.12 0.00 0.00 2.52 4.22 4.08 1.12 8.32 0.00 0.00 0.00 0.00

garnet mass = 13.44 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -177172.50 (J) H = -151841.34 (J) S = 24.76 (J/K) V = 3.38 (cc) Cp = 14.26 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.19 | 17.99 | 19.82 |

orthopyroxene mass = 0.74 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.88Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -9410.22 (J) H = -7967.30 (J) S = 1.41 (J/K) V = 0.21 (cc) Cp = 0.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.29 | 97.46 | 104.33 | 4.00 | -3.89 | 5.15 | 0.24 |

clinopyroxene mass = 7.85 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.37Mg0.55Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -112665.24 (J) H = -97400.52 (J) S = 14.92 (J/K) V = 2.31 (cc) Cp = 8.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.21 | 8.40 | 36.94 | 7.74 | 0.34 | 4.28 | 8.09 |

biotite mass = 4.04 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -63086.11 (J) H = -54248.96 (J) S = 8.64 (J/K) V = 1.45 (cc) Cp = 5.05 (J/K)

| annite | phlogopite |
|---|---|
| 7.13 | 92.87 |

feldspar mass = 38.67 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -621625.77 (J) H = -539098.66 (J) S = 80.66 (J/K) V = 14.84 (cc) Cp = 47.44 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.32 | 19.17 | 8.51 |

feldspar mass = 1.99 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -30894.57 (J) H = -26739.91 (J) S = 4.06 (J/K) V = 0.78 (cc) Cp = 2.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.46 | 1.39 | 69.16 |

quartz mass = 21.96 (gm) density = 2.55 (gm/cc)
SiO2
G = -355038.57 (J) H = -310970.53 (J) S = 43.07 (J/K) V = 8.60 (cc) Cp = 25.43 (J/K)

rhm-oxide mass = 1.08 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.09Fe'"0.14Al0.07Ti0.89O3
G = -10307.61 (J) H = -8350.54 (J) S = 1.91 (J/K) V = 0.23 (cc) Cp = 0.98 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.72 | 7.21 | 75.14 | 5.23 | 3.69 |

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1664.55 (J) H = -1431.01 (J) S = 0.23 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 89.87 (gm) density = 2.82 (gm/cc)
G = -1381865.13 (J) H = -1198048.77 (J) S = 179.66 (J/K) V = 31.84 (cc) Cp = 105.07 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.76 (gm/cc)
G = -1543994.18 (J) H = -1332188.25 (J) S = 207.01 (J/K) V = 36.22 (cc) Cp = 119.01 (J/K)

Oxygen delta moles = -0.00240526 delta grams = -0.0769654
G = 544.82 (J) H = -56.54 (J) S = -0.59 (J/K) V = -204.61 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 8.36 (gm) density = 2.27 (gm/cc) viscosity = 3.51 (log 10 poise) (analysis in wt %)
G = -135078.23 (J) H = -111418.64 (J) S = 23.35 (J/K) V = 3.69 (cc) Cp = 11.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.20 | 0.11 | 11.44 | 0.26 | 0.00 | 0.67 | 1.02 | 0.10 | 0.00 | 0.00 | 2.79 | 4.76 | 3.65 | 1.36 | 9.64 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.10 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.63Mg0.19)3Al2Si3O12
G = -185136.09 (J) H = -159006.47 (J) S = 25.79 (J/K) V = 3.54 (cc) Cp = 14.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.86 | 18.57 | 18.58 |

clinopyroxene mass = 7.52 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.38Mg0.53Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -107553.44 (J) H = -93163.43 (J) S = 14.20 (J/K) V = 2.21 (cc) Cp = 8.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.57 | 7.69 | 37.69 | 7.91 | 0.67 | 4.09 | 8.38 |

clinopyroxene mass = 0.26 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.30Mg0.28Fe'"0.05Ti0.40Al0.74Si1.25O6
G = -3677.12 (J) H = -3198.20 (J) S = 0.47 (J/K) V = 0.07 (cc) Cp = 0.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.68 | 1.31 | 30.42 | 70.90 | 8.98 | -4.39 | 7.46 |

biotite mass = 4.76 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.08Mg0.92)3AlSi3O10(OH)2
G = -74024.59 (J) H = -63770.92 (J) S = 10.12 (J/K) V = 1.71 (cc) Cp = 5.94 (J/K)

| annite | phlogopite |
|---|---|
| 8.14 | 91.86 |

feldspar mass = 38.47 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.73Ca0.19Al1.19Si2.81O8
G = -617713.09 (J) H = -536863.88 (J) S = 79.80 (J/K) V = 14.76 (cc) Cp = 47.54 (J/K)

albite anorthite sanidine
72.97 18.78 8.25

feldspar mass = 2.35 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -36560.53 (J) H = -31713.78 (J) S = 4.78 (J/K) V = 0.93 (cc) Cp = 2.79 (J/K)
albite anorthite sanidine
28.95 1.27 69.78

quartz mass = 22.97 (gm) density = 2.55 (gm/cc)
SiO2
G = -370905.97 (J) H = -325527.70 (J) S = 44.79 (J/K) V = 8.99 (cc) Cp = 26.56 (J/K)

rhm-oxide mass = 1.01 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.08Fe'"0.14Al0.07Ti0.89O3
G = -9628.32 (J) H = -7820.73 (J) S = 1.78 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.19 7.11 75.86 5.28 3.55

apatite mass = 0.11 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1639.54 (J) H = -1412.70 (J) S = 0.22 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 91.56 (gm) density = 2.82 (gm/cc)
G = -1406838.67 (J) H = -1222477.81 (J) S = 181.97 (J/K) V = 32.46 (cc) Cp = 107.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.76 (gm/cc)
G = -1541916.90 (J) H = -1333896.46 (J) S = 205.32 (J/K) V = 36.15 (cc) Cp = 119.03 (J/K)

Oxygen delta moles = -0.0024359 delta grams = -0.0779458
G = 545.81 (J) H = -56.41 (J) S = -0.59 (J/K) V = -205.19 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 730.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.07 COH = 1.06 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 6.55 (gm) density = 2.23 (gm/cc) viscosity = 2.63 (log 10 poise) (analysis in wt %)
G = -106029.33 (J) H = -86835.86 (J) S = 19.13 (J/K) V = 2.94 (cc) Cp = 9.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.81 | 0.08 | 10.70 | 0.30 | 0.00 | 0.75 | 1.48 | 0.09 | 0.00 | 0.00 | 3.36 | 5.68 | 2.97 | 1.86 | 11.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.36 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.64Mg0.17)3Al2Si3O12
G = -187747.92 (J) H = -161579.76 (J) S = 26.09 (J/K) V = 3.60 (cc) Cp = 15.15 (J/K)
almandine grossular pyrope
63.73 18.89 17.38

clinopyroxene mass = 5.96 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.84Fe"0.39Mg0.51Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -84868.37 (J) H = -73642.29 (J) S = 11.19 (J/K) V = 1.75 (cc) Cp = 6.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.38 | 7.33 | 39.02 | 7.58 | 1.03 | 3.90 | 8.75 |

clinopyroxene mass = 2.13 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.31Mg0.27Fe'"0.05Ti0.40Al0.74Si1.25O6
G = -30309.58 (J) H = -26410.97 (J) S = 3.89 (J/K) V = 0.59 (cc) Cp = 2.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.67 | 1.21 | 31.42 | 70.67 | 9.30 | -4.70 | 7.76 |

biotite mass = 5.35 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.10Mg0.90)3AlSi3O10(OH)2
G = -82673.36 (J) H = -71337.49 (J) S = 11.30 (J/K) V = 1.91 (cc) Cp = 6.65 (J/K)

| annite | phlogopite |
|---|---|
| 9.56 | 90.44 |

feldspar mass = 37.98 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.18Al1.18Si2.82O8
G = -609053.52 (J) H = -530455.38 (J) S = 78.35 (J/K) V = 14.57 (cc) Cp = 47.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.00 | 17.87 | 8.14 |

feldspar mass = 2.85 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -44234.73 (J) H = -38454.72 (J) S = 5.76 (J/K) V = 1.12 (cc) Cp = 3.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.78 | 1.15 | 70.06 |

quartz mass = 24.09 (gm) density = 2.55 (gm/cc)
SiO2
G = -388420.09 (J) H = -341588.35 (J) S = 46.68 (J/K) V = 9.43 (cc) Cp = 27.81 (J/K)

rhm-oxide mass = 0.54 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.76Mg0.08Fe'"0.14Al0.07Ti0.89O3
G = -5132.17 (J) H = -4178.86 (J) S = 0.95 (J/K) V = 0.12 (cc) Cp = 0.49 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.65 | 7.14 | 76.32 | 5.51 | 3.38 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1353.60 (J) H = -1168.96 (J) S = 0.18 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 93.36 (gm) density = 2.82 (gm/cc)
G = -1433793.36 (J) H = -1248816.77 (J) S = 184.40 (J/K) V = 33.13 (cc) Cp = 109.79 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.77 (gm/cc)
G = -1539822.68 (J) H = -1335652.62 (J) S = 203.53 (J/K) V = 36.07 (cc) Cp = 119.22 (J/K)

Oxygen delta moles = -0.00253191 delta grams = -0.0810182

G = 561.15 (J)  H = -57.75 (J)  S = -0.62 (J/K)  V = -211.17 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 720.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -15.74  delta HM = -5.21  NNO = 0.00  QFM = -0.09  COH = 1.03
IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid  mass = 4.61 (gm)  density = 2.17 (gm/cc)  viscosity = 1.25 (log 10 poise)  (analysis in wt %)
G = -74876.77 (J)  H = -60396.68 (J)  S = 14.58 (J/K)  V = 2.13 (cc)  Cp = 6.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.13 | 0.04 | 9.45 | 0.38 | 0.00 | 0.87 | 2.36 | 0.07 | 0.00 | 0.00 | 4.91 | 7.09 | 2.01 | 3.24 | 16.46 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.55 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.19Fe"0.65Mg0.16)3Al2Si3O12
G = -189337.71 (J)  H = -163281.43 (J)  S = 26.24 (J/K)  V = 3.64 (cc)  Cp = 15.30 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.59 | 19.12 | 16.29 |

clinopyroxene  mass = 4.51 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.84Fe"0.40Mg0.49Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -63897.28 (J)  H = -55541.38 (J)  S = 8.41 (J/K)  V = 1.32 (cc)  Cp = 4.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.09 | 7.03 | 40.38 | 7.22 | 1.44 | 3.68 | 9.14 |

clinopyroxene  mass = 3.96 (gm)  density = 3.60 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.32Mg0.26Fe'"0.05Ti0.40Al0.73Si1.25O6
G = -56138.35 (J)  H = -49008.51 (J)  S = 7.18 (J/K)  V = 1.10 (cc)  Cp = 4.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -16.63 | 1.13 | 32.40 | 70.39 | 9.67 | -5.06 | 8.10 |

biotite  mass = 5.94 (gm)  density = 2.81 (gm/cc)  (analysis in mole %)
K(Fe"0.11Mg0.89)3AlSi3O10(OH)2
G = -91020.18 (J)  H = -78658.83 (J)  S = 12.45 (J/K)  V = 2.11 (cc)  Cp = 7.35 (J/K)

| annite | phlogopite |
|---|---|
| 11.24 | 88.76 |

feldspar  mass = 37.74 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.75Ca0.17Al1.17Si2.83O8
G = -604310.76 (J)  H = -527436.67 (J)  S = 77.40 (J/K)  V = 14.49 (cc)  Cp = 47.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.06 | 16.89 | 8.05 |

feldspar  mass = 3.25 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -50273.80 (J)  H = -43800.30 (J)  S = 6.52 (J/K)  V = 1.28 (cc)  Cp = 3.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.63 | 1.04 | 70.33 |

quartz  mass = 25.25 (gm)  density = 2.55 (gm/cc)

SiO2
G = -406733.19 (J)  H = -358414.00 (J)  S = 48.65 (J/K)  V = 9.89 (cc)  Cp = 29.12 (J/K)

rhm-oxide  mass = 0.08 (gm)  density = 4.69 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.77Mg0.07Fe'"0.14Al0.06Ti0.90O3
G = -740.90 (J)  H = -604.81 (J)  S = 0.14 (J/K)  V = 0.02 (cc)  Cp = 0.07 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.12 | 7.13 | 77.20 | 5.34 | 3.19 |

apatite  mass = 0.03 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -416.62 (J)  H = -360.59 (J)  S = 0.06 (J/K)  V = 0.01 (cc)  Cp = 0.03 (J/K)

Total solids  mass = 95.30 (gm)  density = 2.82 (gm/cc)
G = -1462868.80 (J)  H = -1277106.52 (J)  S = 187.04 (J/K)  V = 33.85 (cc)  Cp = 112.65 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.78 (gm/cc)
G = -1537745.57 (J)  H = -1337503.20 (J)  S = 201.62 (J/K)  V = 35.98 (cc)  Cp = 119.61 (J/K)

Oxygen  delta moles = -0.00263083  delta grams = -0.0841835
G = 576.67 (J)  H = -59.09 (J)  S = -0.64 (J/K)  V = -217.24 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 710.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -16.00  delta HM = -5.22  NNO = 0.00  QFM = -0.10  COH = 0.99
IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid  mass = 3.70 (gm)  density = 2.12 (gm/cc)  viscosity = 0.46 (log 10 poise)  (analysis in wt %)
G = -60281.61 (J)  H = -48132.37 (J)  S = 12.36 (J/K)  V = 1.75 (cc)  Cp = 5.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47.07 | 0.02 | 8.55 | 0.40 | 0.00 | 0.85 | 3.00 | 0.06 | 0.00 | 0.00 | 6.16 | 7.88 | 1.51 | 4.36 | 20.13 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.56 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.20Fe"0.65Mg0.15)3Al2Si3O12
G = -188992.45 (J)  H = -163358.89 (J)  S = 26.07 (J/K)  V = 3.64 (cc)  Cp = 15.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.83 | 19.75 | 15.42 |

clinopyroxene  mass = 4.10 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.84Fe"0.41Mg0.49Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -58004.56 (J)  H = -50528.38 (J)  S = 7.60 (J/K)  V = 1.20 (cc)  Cp = 4.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.32 | 6.53 | 40.67 | 7.04 | 1.46 | 3.64 | 9.35 |

clinopyroxene  mass = 4.28 (gm)  density = 3.60 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.33Mg0.25Fe'"0.04Ti0.40Al0.74Si1.25O6
G = -60573.90 (J)  H = -52992.54 (J)  S = 7.71 (J/K)  V = 1.19 (cc)  Cp = 4.54 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-17.31 1.02 32.85 70.83 9.64 -5.19 8.16

biotite mass = 6.28 (gm) density = 2.81 (gm/cc) (analysis in mole %)
K(Fe"0.12Mg0.88)3AlSi3O10(OH)2
G = -95904.11 (J) H = -83036.21 (J) S = 13.09 (J/K) V = 2.23 (cc) Cp = 7.76 (J/K)
annite phlogopite
12.13 87.87

feldspar mass = 37.88 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.76Ca0.17Al1.17Si2.83O8
G = -605857.32 (J) H = -529951.78 (J) S = 77.21 (J/K) V = 14.53 (cc) Cp = 48.79 (J/K)
albite anorthite sanidine
75.54 16.75 7.71

feldspar mass = 3.37 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -52168.27 (J) H = -45551.13 (J) S = 6.73 (J/K) V = 1.33 (cc) Cp = 4.05 (J/K)
albite anorthite sanidine
27.91 0.95 71.14

quartz mass = 25.73 (gm) density = 2.59 (gm/cc)
SiO2
G = -413932.03 (J) H = -366058.47 (J) S = 48.69 (J/K) V = 9.94 (cc) Cp = 34.40 (J/K)

Total solids mass = 96.21 (gm) density = 2.82 (gm/cc)
G = -1475432.64 (J) H = -1291477.40 (J) S = 187.11 (J/K) V = 34.06 (cc) Cp = 119.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1535714.25 (J) H = -1339609.76 (J) S = 199.47 (J/K) V = 35.81 (cc) Cp = 125.06 (J/K)

Oxygen delta moles = -0.0026741 delta grams = -0.0855679
G = 579.65 (J) H = -59.14 (J) S = -0.65 (J/K) V = -218.59 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 700.00 (C) P = 6.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = -0.11 COH = 0.95
IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 1.96 (gm) density = 2.13 (gm/cc) viscosity = -0.37 (log 10 poise) (analysis in wt %)
G = -31343.97 (J) H = -24929.26 (J) S = 6.59 (J/K) V = 0.92 (cc) Cp = 3.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36.85 | 0.02 | 7.19 | 0.35 | 0.00 | 0.68 | 5.67 | 0.05 | 0.00 | 0.00 | 10.69 | 6.89 | 1.10 | 8.25 | 22.26 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.93 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.21Fe"0.64Mg0.15)3Al2Si3O12
G = -193824.93 (J) H = -167977.51 (J) S = 26.56 (J/K) V = 3.74 (cc) Cp = 15.63 (J/K)

almandine grossular pyrope
64.21 20.88 14.92

clinopyroxene mass = 4.33 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.85Fe"0.39Mg0.49Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -61322.06 (J) H = -53566.89 (J) S = 7.97 (J/K) V = 1.27 (cc) Cp = 4.69 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
33.75 5.82 39.27 7.07 0.94 3.83 9.31

clinopyroxene mass = 4.24 (gm) density = 3.61 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.32Mg0.25Fe'"0.04Ti0.41Al0.75Si1.24O6
G = -60007.74 (J) H = -52626.40 (J) S = 7.58 (J/K) V = 1.18 (cc) Cp = 4.49 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-17.52 0.88 32.46 72.19 9.15 -5.04 7.88

biotite mass = 6.13 (gm) density = 2.81 (gm/cc) (analysis in mole %)
K(Fe"0.11Mg0.89)3AlSi3O10(OH)2
G = -93811.06 (J) H = -81444.59 (J) S = 12.71 (J/K) V = 2.18 (cc) Cp = 7.57 (J/K)
annite phlogopite
11.20 88.80

feldspar mass = 32.91 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.75Ca0.18Al1.18Si2.82O8
G = -525966.64 (J) H = -461128.76 (J) S = 66.63 (J/K) V = 12.61 (cc) Cp = 43.10 (J/K)
albite anorthite sanidine
75.30 17.56 7.14

feldspar mass = 4.49 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.73Na0.27Ca0.01Al1.01Si2.99O8
G = -69274.94 (J) H = -60622.61 (J) S = 8.89 (J/K) V = 1.77 (cc) Cp = 5.41 (J/K)
albite anorthite sanidine
26.58 0.89 72.53

quartz mass = 26.85 (gm) density = 2.59 (gm/cc)
SiO2
G = -431414.94 (J) H = -382324.49 (J) S = 50.44 (J/K) V = 10.35 (cc) Cp = 35.58 (J/K)

leucite mass = 4.08 (gm) density = 2.27 (gm/cc) (analysis in mole %)
K0.00Na1.00AlSi2O5.06(OH)1.88
G = -66739.95 (J) H = -56862.24 (J) S = 10.15 (J/K) V = 1.80 (cc) Cp = 6.29 (J/K)
leucite analcime na-leucite
0.44 94.18 5.38

Total solids mass = 97.95 (gm) density = 2.81 (gm/cc)
G = -1502362.27 (J) H = -1316553.50 (J) S = 190.94 (J/K) V = 34.90 (cc) Cp = 122.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1533706.24 (J) H = -1341482.76 (J) S = 197.53 (J/K) V = 35.81 (cc) Cp = 125.97 (J/K)

Oxygen delta moles = -0.00271899 delta grams = -0.0870044
G = 582.78 (J) H = -59.19 (J) S = -0.66 (J/K) V = -220.00 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.50 (log 10 poise)  (analysis in wt %)
G = -1677898.21 (J)  H = -1232962.70 (J)  S = 282.83 (J/K)  V = 39.84 (cc)  Cp = 144.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.97 | 0.00 | 4.92 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1677898.21 (J)  H = -1232962.70 (J)  S = 282.83 (J/K)  V = 39.84 (cc)  Cp = 144.50 (J/K)

Oxygen  delta moles = -1.66533e-16  delta grams = -5.32887e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.55 (log 10 poise)  (analysis in wt %)
G = -1675076.24 (J)  H = -1234409.13 (J)  S = 281.91 (J/K)  V = 39.81 (cc)  Cp = 144.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.97 | 0.00 | 4.92 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.55 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1675076.24 (J)  H = -1234409.13 (J)  S = 281.91 (J/K)  V = 39.81 (cc)  Cp = 144.49 (J/K)

Oxygen  delta moles = 3.18402e-06  delta grams = 0.000101885
G = -1.16 (J)  H = 0.14 (J)  S = 0.00 (J/K)  V = 0.41 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1672263.72 (J)  H = -1235855.66 (J)  S = 280.98 (J/K)  V = 39.78 (cc)  Cp = 144.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.97 | 0.00 | 4.92 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1672263.72 (J)  H = -1235855.66 (J)  S = 280.98 (J/K)  V = 39.78 (cc)  Cp = 144.48 (J/K)

Oxygen  delta moles = 6.77072e-06  delta grams = 0.000216655
G = -2.44 (J)  H = 0.29 (J)  S = 0.00 (J/K)  V = 0.87 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.66 (log 10 poise)  (analysis in wt %)
G = -1669460.73 (J)  H = -1237302.30 (J)  S = 280.05 (J/K)  V = 39.75 (cc)  Cp = 144.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.98 | 0.00 | 4.92 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.66 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1669460.73 (J)  H = -1237302.30 (J)  S = 280.05 (J/K)  V = 39.75 (cc)  Cp = 144.48 (J/K)

Oxygen  delta moles = 1.07714e-05  delta grams = 0.000344671
G = -3.85 (J)  H = 0.45 (J)  S = 0.00 (J/K)  V = 1.38 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.71 (log 10 poise)  (analysis in wt %)
G = -1666667.33 (J)  H = -1238749.07 (J)  S = 279.11 (J/K)  V = 39.72 (cc)  Cp = 144.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.98 | 0.00 | 4.92 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1666667.33 (J)  H = -1238749.07 (J)  S = 279.11 (J/K)  V = 39.72 (cc)  Cp = 144.47 (J/K)

Oxygen  delta moles = 1.51977e-05  delta grams = 0.000486308
G = -5.40 (J)  H = 0.64 (J)  S = 0.00 (J/K)  V = 1.94 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.77 (log 10 poise)  (analysis in wt %)
G = -1663883.58 (J)  H = -1240195.96 (J)  S = 278.17 (J/K)  V = 39.69 (cc)  Cp = 144.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.98 | 0.00 | 4.92 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1663883.58 (J)  H = -1240195.96 (J)  S = 278.17 (J/K)  V = 39.69 (cc)  Cp = 144.46 (J/K)

Oxygen  delta moles = 2.00619e-05  delta grams = 0.000641958
G = -7.07 (J)  H = 0.83 (J)  S = 0.01 (J/K)  V = 2.54 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1240.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.24  COH = 2.19  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.52 (gm/cc) viscosity = 3.83 (log 10 poise) (analysis in wt %)
G = -1661109.55 (J) H = -1241643.00 (J) S = 277.21 (J/K) V = 39.66 (cc) Cp = 144.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.98 | 0.00 | 4.92 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.83 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1661109.55 (J) H = -1241643.00 (J) S = 277.21 (J/K) V = 39.66 (cc) Cp = 144.45 (J/K)

Oxygen delta moles = 2.53769e-05 delta grams = 0.00081203
G = -8.88 (J) H = 1.04 (J) S = 0.01 (J/K) V = 3.19 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.52 (gm/cc) viscosity = 3.88 (log 10 poise) (analysis in wt %)
G = -1658345.32 (J) H = -1243090.18 (J) S = 276.26 (J/K) V = 39.63 (cc) Cp = 144.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.98 | 0.00 | 4.91 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1658345.32 (J) H = -1243090.18 (J) S = 276.26 (J/K) V = 39.63 (cc) Cp = 144.45 (J/K)

Oxygen delta moles = 3.11559e-05 delta grams = 0.00099695
G = -10.82 (J) H = 1.27 (J) S = 0.01 (J/K) V = 3.89 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.53 (gm/cc) viscosity = 3.94 (log 10 poise) (analysis in wt %)
G = -1655590.94 (J) H = -1244537.52 (J) S = 275.29 (J/K) V = 39.60 (cc) Cp = 144.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.98 | 0.00 | 4.91 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.94 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1655590.94 (J) H = -1244537.52 (J) S = 275.29 (J/K) V = 39.60 (cc) Cp = 144.44 (J/K)

Oxygen delta moles = 3.74127e-05 delta grams = 0.00119716
G = -12.90 (J) H = 1.51 (J) S = 0.01 (J/K) V = 4.64 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 99.45 (gm) density = 2.53 (gm/cc) viscosity = 4.02 (log 10 poise) (analysis in wt %)
G = -1644167.60 (J) H = -1239521.09 (J) S = 272.83 (J/K) V = 39.38 (cc) Cp = 143.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.54 | 0.65 | 14.24 | 0.98 | 0.00 | 4.86 | 0.11 | 2.53 | 0.00 | 0.00 | 4.38 | 3.85 | 1.69 | 0.16 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.55 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.45Mg1.45Fe"'0.02Ti0.00Al0.09Si1.94O6
G = -8664.93 (J) H = -6674.16 (J) S = 1.34 (J/K) V = 0.17 (cc) Cp = 0.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -46.22 | 95.40 | 44.82 | 3.58 | -3.32 | 5.46 | 0.29 |

Total solids mass = 0.55 (gm) density = 3.29 (gm/cc)
G = -8664.93 (J) H = -6674.16 (J) S = 1.34 (J/K) V = 0.17 (cc) Cp = 0.69 (J/K)

Viscosity of the System: 4.03 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1652832.54 (J) H = -1246195.25 (J) S = 274.17 (J/K) V = 39.55 (cc) Cp = 144.23 (J/K)

Oxygen delta moles = 1.78581e-05 delta grams = 0.000571438
G = -6.11 (J) H = 0.71 (J) S = 0.00 (J/K) V = 2.20 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1200.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.56  delta HM = -4.85  NNO = 0.00  QFM = 0.22  COH = 2.12  IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.76 (gm)  density = 2.52 (gm/cc)  viscosity = 4.11 (log 10 poise)  (analysis in wt %)
G = -1630865.28 (J)  H = -1233022.82 (J)  S = 270.06 (J/K)  V = 39.12 (cc)  Cp = 135.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.62 | 0.65 | 14.32 | 0.97 | 0.00 | 4.79 | 0.11 | 2.37 | 0.00 | 0.00 | 4.40 | 3.88 | 1.70 | 0.16 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.24 (gm)  density = 3.30 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.46Mg1.43Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -19215.55 (J)  H = -14826.70 (J)  S = 2.98 (J/K)  V = 0.37 (cc)  Cp = 1.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -47.68 | 95.16 | 46.40 | 3.66 | -3.40 | 5.57 | 0.30 |

Total solids  mass = 1.24 (gm)  density = 3.30 (gm/cc)
G = -19215.55 (J)  H = -14826.70 (J)  S = 2.98 (J/K)  V = 0.37 (cc)  Cp = 1.54 (J/K)

Viscosity of the System: 4.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1650080.82 (J)  H = -1247849.52 (J)  S = 273.04 (J/K)  V = 39.49 (cc)  Cp = 137.23 (J/K)

Oxygen  delta moles = -1.03301e-05  delta grams = -0.000330552
G = 3.51 (J)  H = -0.41 (J)  S = -0.00 (J/K)  V = -1.27 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1190.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.68  delta HM = -4.86  NNO = 0.00  QFM = 0.21  COH = 2.10  IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.10 (gm)  density = 2.52 (gm/cc)  viscosity = 4.20 (log 10 poise)  (analysis in wt %)
G = -1617953.22 (J)  H = -1226756.76 (J)  S = 267.37 (J/K)  V = 38.86 (cc)  Cp = 134.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.70 | 0.66 | 14.40 | 0.96 | 0.00 | 4.72 | 0.11 | 2.21 | 0.00 | 0.00 | 4.42 | 3.90 | 1.71 | 0.16 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.90 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.48Mg1.41Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -29385.88 (J)  H = -22713.64 (J)  S = 4.56 (J/K)  V = 0.57 (cc)  Cp = 2.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -49.17 | 94.90 | 48.02 | 3.74 | -3.48 | 5.68 | 0.31 |

Total solids  mass = 1.90 (gm)  density = 3.31 (gm/cc)
G = -29385.88 (J)  H = -22713.64 (J)  S = 4.56 (J/K)  V = 0.57 (cc)  Cp = 2.35 (J/K)

Viscosity of the System: 4.22 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1647339.10 (J) H = -1249470.39 (J) S = 271.93 (J/K) V = 39.43 (cc) Cp = 137.00 (J/K)

Oxygen delta moles = -4.06971e-05 delta grams = -0.00130226
G = 13.71 (J) H = -1.60 (J) S = -0.01 (J/K) V = -4.95 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 97.45 (gm) density = 2.52 (gm/cc) viscosity = 4.29 (log 10 poise) (analysis in wt %)
G = -1605402.00 (J) H = -1220723.95 (J) S = 264.72 (J/K) V = 38.61 (cc) Cp = 133.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.79 | 0.66 | 14.48 | 0.95 | 0.00 | 4.64 | 0.11 | 2.06 | 0.00 | 0.00 | 4.44 | 3.93 | 1.72 | 0.17 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.55 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.50Mg1.39Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -39205.28 (J) H = -30356.05 (J) S = 6.09 (J/K) V = 0.77 (cc) Cp = 3.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.69 | 94.64 | 49.67 | 3.83 | -3.57 | 5.80 | 0.33 |

Total solids mass = 2.55 (gm) density = 3.32 (gm/cc)
G = -39205.28 (J) H = -30356.05 (J) S = 6.09 (J/K) V = 0.77 (cc) Cp = 3.15 (J/K)

Viscosity of the System: 4.32 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1644607.28 (J) H = -1251080.00 (J) S = 270.81 (J/K) V = 39.38 (cc) Cp = 136.77 (J/K)

Oxygen delta moles = -7.33657e-05 delta grams = -0.00234761
G = 24.53 (J) H = -2.85 (J) S = -0.02 (J/K) V = -8.86 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 96.81 (gm) density = 2.52 (gm/cc) viscosity = 4.38 (log 10 poise) (analysis in wt %)
G = -1593185.24 (J) H = -1214906.20 (J) S = 262.12 (J/K) V = 38.36 (cc) Cp = 132.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.88 | 0.67 | 14.56 | 0.94 | 0.00 | 4.56 | 0.11 | 1.92 | 0.00 | 0.00 | 4.46 | 3.95 | 1.73 | 0.17 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.19 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.51Mg1.37Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -48700.09 (J) H = -37772.91 (J) S = 7.57 (J/K) V = 0.96 (cc) Cp = 3.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.23 | 94.37 | 51.35 | 3.93 | -3.66 | 5.92 | 0.34 |

Total solids mass = 3.19 (gm) density = 3.33 (gm/cc)
G = -48700.09 (J) H = -37772.91 (J) S = 7.57 (J/K) V = 0.96 (cc) Cp = 3.92 (J/K)

Viscosity of the System: 4.42 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1641885.32 (J) H = -1252679.12 (J) S = 269.69 (J/K) V = 39.32 (cc) Cp = 136.54 (J/K)

Oxygen delta moles = -0.000108446 delta grams = -0.00347013
G = 35.99 (J) H = -4.18 (J) S = -0.03 (J/K) V = -13.01 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1160.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.05 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 96.19 (gm) density = 2.52 (gm/cc) viscosity = 4.47 (log 10 poise) (analysis in wt %)
G = -1581279.13 (J) H = -1209286.96 (J) S = 259.56 (J/K) V = 38.12 (cc) Cp = 131.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.97 | 0.67 | 14.64 | 0.93 | 0.00 | 4.47 | 0.12 | 1.79 | 0.00 | 0.00 | 4.48 | 3.98 | 1.74 | 0.17 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.81 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.53Mg1.34Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -57894.07 (J) H = -44981.46 (J) S = 9.01 (J/K) V = 1.14 (cc) Cp = 4.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.80 | 94.08 | 53.06 | 4.02 | -3.76 | 6.04 | 0.35 |

Total solids mass = 3.81 (gm) density = 3.33 (gm/cc)
G = -57894.07 (J) H = -44981.46 (J) S = 9.01 (J/K) V = 1.14 (cc) Cp = 4.67 (J/K)

Viscosity of the System: 4.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1639173.20 (J) H = -1254268.42 (J) S = 268.57 (J/K) V = 39.26 (cc) Cp = 136.32 (J/K)

Oxygen delta moles = -0.000146033 delta grams = -0.00467289
G = 48.09 (J) H = -5.57 (J) S = -0.04 (J/K) V = -17.40 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1150.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.03 IW

= 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 95.57 (gm) density = 2.52 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -1569662.40 (J) H = -1203851.36 (J) S = 257.04 (J/K) V = 37.89 (cc) Cp = 130.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.06 | 0.67 | 14.71 | 0.92 | 0.00 | 4.38 | 0.12 | 1.67 | 0.00 | 0.00 | 4.50 | 4.00 | 1.75 | 0.17 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.42 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.55Mg1.32Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -66808.48 (J) H = -51997.15 (J) S = 10.41 (J/K) V = 1.32 (cc) Cp = 5.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.39 | 93.79 | 54.79 | 4.13 | -3.86 | 6.17 | 0.37 |

Total solids mass = 4.42 (gm) density = 3.34 (gm/cc)
G = -66808.48 (J) H = -51997.15 (J) S = 10.41 (J/K) V = 1.32 (cc) Cp = 5.40 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1636470.88 (J) H = -1255848.51 (J) S = 267.45 (J/K) V = 39.21 (cc) Cp = 136.10 (J/K)

Oxygen delta moles = -0.000186208 delta grams = -0.00595844
G = 60.84 (J) H = -7.04 (J) S = -0.05 (J/K) V = -22.03 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1140.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.18 COH = 2.01 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 94.97 (gm) density = 2.52 (gm/cc) viscosity = 4.66 (log 10 poise) (analysis in wt %)
G = -1558316.26 (J) H = -1198586.18 (J) S = 254.56 (J/K) V = 37.66 (cc) Cp = 129.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.15 | 0.68 | 14.79 | 0.90 | 0.00 | 4.28 | 0.12 | 1.55 | 0.00 | 0.00 | 4.51 | 4.03 | 1.77 | 0.17 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.02 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.57Mg1.30Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -75462.11 (J) H = -58833.73 (J) S = 11.77 (J/K) V = 1.50 (cc) Cp = 6.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.99 | 93.49 | 56.54 | 4.23 | -3.97 | 6.31 | 0.38 |

Total solids mass = 5.02 (gm) density = 3.35 (gm/cc)
G = -75462.11 (J) H = -58833.73 (J) S = 11.77 (J/K) V = 1.50 (cc) Cp = 6.12 (J/K)

Viscosity of the System: 4.73 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1633778.37 (J) H = -1257419.91 (J) S = 266.33 (J/K) V = 39.15 (cc) Cp = 135.88 (J/K)

Oxygen delta moles = -0.000229033 delta grams = -0.00732879
G = 74.24 (J) H = -8.57 (J) S = -0.06 (J/K) V = -26.91 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1130.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.17 COH = 1.99 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 94.38 (gm) density = 2.52 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1547224.35 (J) H = -1193479.83 (J) S = 252.11 (J/K) V = 37.43 (cc) Cp = 128.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.25 | 0.68 | 14.86 | 0.89 | 0.00 | 4.17 | 0.12 | 1.44 | 0.00 | 0.00 | 4.53 | 4.05 | 1.78 | 0.17 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.62 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.58Mg1.28Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -83871.32 (J) H = -65503.23 (J) S = 13.09 (J/K) V = 1.67 (cc) Cp = 6.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.60 | 93.19 | 58.29 | 4.35 | -4.08 | 6.45 | 0.40 |

Total solids mass = 5.62 (gm) density = 3.36 (gm/cc)
G = -83871.32 (J) H = -65503.23 (J) S = 13.09 (J/K) V = 1.67 (cc) Cp = 6.81 (J/K)

Viscosity of the System: 4.83 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1631095.67 (J) H = -1258983.05 (J) S = 265.20 (J/K) V = 39.10 (cc) Cp = 135.67 (J/K)

Oxygen delta moles = -0.000274551 delta grams = -0.00878529
G = 88.30 (J) H = -10.17 (J) S = -0.07 (J/K) V = -32.03 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 93.79 (gm) density = 2.52 (gm/cc) viscosity = 4.85 (log 10 poise) (analysis in wt %)
G = -1536372.66 (J) H = -1188522.27 (J) S = 249.69 (J/K) V = 37.21 (cc) Cp = 127.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.35 | 0.69 | 14.93 | 0.87 | 0.00 | 4.06 | 0.12 | 1.33 | 0.00 | 0.00 | 4.54 | 4.08 | 1.79 | 0.17 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.20 (gm) density = 3.37 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.07Fe"0.60Mg1.26Fe'''0.02Ti0.00Al0.11Si1.93O6
G = -92050.15 (J) H = -72016.03 (J) S = 14.38 (J/K) V = 1.84 (cc) Cp = 7.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.21 | 92.88 | 60.06 | 4.47 | -4.20 | 6.59 | 0.42 |

Total solids mass = 6.20 (gm) density = 3.37 (gm/cc)
G = -92050.15 (J) H = -72016.03 (J) S = 14.38 (J/K) V = 1.84 (cc) Cp = 7.50 (J/K)

Viscosity of the System: 4.94 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1628422.81 (J) H = -1260538.30 (J) S = 264.07 (J/K) V = 39.05 (cc) Cp = 135.46 (J/K)

Oxygen delta moles = -0.000322782 delta grams = -0.0103287
G = 102.98 (J) H = -11.84 (J) S = -0.08 (J/K) V = -37.39 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1110.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.16 COH = 1.95 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 92.70 (gm) density = 2.52 (gm/cc) viscosity = 4.97 (log 10 poise) (analysis in wt %)
G = -1518647.54 (J) H = -1178395.23 (J) S = 246.00 (J/K) V = 36.82 (cc) Cp = 126.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.58 | 0.69 | 15.03 | 0.83 | 0.00 | 3.85 | 0.12 | 1.24 | 0.00 | 0.00 | 4.47 | 4.12 | 1.81 | 0.17 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.39 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.61Mg1.24Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -50083.17 (J) H = -39263.65 (J) S = 7.82 (J/K) V = 1.00 (cc) Cp = 4.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.38 | 92.75 | 61.22 | 4.60 | -4.32 | 6.71 | 0.43 |

clinopyroxene mass = 3.90 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.63Mg1.08Fe'''0.04Ti0.00Al0.16Si1.91O6
G = -57024.49 (J) H = -44562.88 (J) S = 9.01 (J/K) V = 1.16 (cc) Cp = 4.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.05 | 81.92 | 63.41 | 5.82 | -5.29 | 8.89 | 1.30 |

Total solids mass = 7.29 (gm) density = 3.37 (gm/cc)
G = -107107.67 (J) H = -83826.53 (J) S = 16.83 (J/K) V = 2.16 (cc) Cp = 8.70 (J/K)

Viscosity of the System: 5.07 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1625755.21 (J) H = -1262221.76 (J) S = 262.83 (J/K) V = 38.98 (cc) Cp = 135.08 (J/K)

Oxygen delta moles = -0.000382778 delta grams = -0.0122484
G = 121.15 (J) H = -13.91 (J) S = -0.10 (J/K) V = -44.02 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1100.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.93  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.72 (gm)  density = 2.51 (gm/cc)  viscosity = 5.08 (log 10 poise)  (analysis in wt %)
G = -1469404.68 (J)  H = -1143435.83 (J)  S = 237.39 (J/K)  V = 35.71 (cc)  Cp = 122.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.00 | 0.71 | 14.93 | 0.80 | 0.00 | 3.68 | 0.12 | 1.14 | 0.00 | 0.00 | 4.33 | 4.12 | 1.86 | 0.18 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.00 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.07Fe"0.63Mg1.23Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -14672.02 (J)  H = -11522.98 (J)  S = 2.29 (J/K)  V = 0.29 (cc)  Cp = 1.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.24 | 92.81 | 62.98 | 4.63 | -4.34 | 6.72 | 0.44 |

clinopyroxene  mass = 7.48 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.65Mg1.06Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -108851.27 (J)  H = -85224.92 (J)  S = 17.21 (J/K)  V = 2.21 (cc)  Cp = 8.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.53 | 81.80 | 64.94 | 5.84 | -5.29 | 8.90 | 1.34 |

feldspar  mass = 1.78 (gm)  density = 2.63 (gm/cc)  (analysis in mole %)
K0.02Na0.58Ca0.40Al1.40Si2.60O8
G = -30159.02 (J)  H = -24234.40 (J)  S = 4.31 (J/K)  V = 0.68 (cc)  Cp = 2.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.04 | 40.08 | 1.87 |

Total solids  mass = 10.26 (gm)  density = 3.22 (gm/cc)
G = -153682.31 (J)  H = -120982.30 (J)  S = 23.81 (J/K)  V = 3.19 (cc)  Cp = 12.22 (J/K)

Viscosity of the System: 5.24 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.57 (gm/cc)
G = -1623086.99 (J)  H = -1264418.14 (J)  S = 261.20 (J/K)  V = 38.89 (cc)  Cp = 134.33 (J/K)

Oxygen  delta moles = -0.000469266  delta grams = -0.015016
G = 147.32 (J)  H = -16.88 (J)  S = -0.12 (J/K)  V = -53.58 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1090.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.93  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.91  IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid  mass = 85.68 (gm)  density = 2.51 (gm/cc)  viscosity = 5.18 (log 10 poise)  (analysis in wt %)
G = -1401922.05 (J)  H = -1093795.19 (J)  S = 226.04 (J/K)  V = 34.17 (cc)  Cp = 116.34 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.51 0.74 14.66 0.78 0.00 3.58 0.13 1.04 0.00 0.00 4.19 4.06 1.94 0.19 1.18 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.62 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.66Mg1.20Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -8992.44 (J) H = -7072.50 (J) S = 1.41 (J/K) V = 0.18 (cc) Cp = 0.74 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-65.82 92.92 65.52 4.56 -4.28 6.67 0.44

clinopyroxene mass = 8.83 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.67Mg1.04Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -127611.38 (J) H = -100061.54 (J) S = 20.21 (J/K) V = 2.60 (cc) Cp = 10.39 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-60.01 81.99 67.30 5.74 -5.17 8.80 1.34

feldspar mass = 4.85 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.59Ca0.39Al1.39Si2.61O8
G = -81901.26 (J) H = -65954.37 (J) S = 11.70 (J/K) V = 1.85 (cc) Cp = 5.94 (J/K)
albite anorthite sanidine
59.00 39.01 1.98

Total solids mass = 14.30 (gm) density = 3.09 (gm/cc)
G = -218505.08 (J) H = -173088.41 (J) S = 33.32 (J/K) V = 4.63 (cc) Cp = 17.07 (J/K)

Viscosity of the System: 5.42 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1620427.13 (J) H = -1266883.59 (J) S = 259.36 (J/K) V = 38.80 (cc) Cp = 133.41 (J/K)

Oxygen delta moles = -0.000573857 delta grams = -0.0183627
G = 178.70 (J) H = -20.43 (J) S = -0.15 (J/K) V = -65.04 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1080.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.14 COH = 1.89 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 81.94 (gm) density = 2.50 (gm/cc) viscosity = 5.28 (log 10 poise) (analysis in wt %)
G = -1339663.07 (J) H = -1047991.10 (J) S = 215.55 (J/K) V = 32.74 (cc) Cp = 111.03 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.01 0.78 14.39 0.76 0.00 3.47 0.14 0.95 0.00 0.00 4.07 4.00 2.01 0.20 1.23 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.41 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.68Mg1.18Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -5956.10 (J) H = -4691.31 (J) S = 0.93 (J/K) V = 0.12 (cc) Cp = 0.49 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-68.36 93.02 68.01 4.51 -4.22 6.61 0.43

clinopyroxene mass = 9.92 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.70Mg1.02Fe'''0.04Ti0.00Al0.16Si1.91O6
G = -142280.04 (J) H = -111735.26 (J) S = 22.57 (J/K) V = 2.91 (cc) Cp = 11.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.34 | 82.10 | 69.60 | 5.64 | -5.05 | 8.70 | 1.35 |

feldspar mass = 7.71 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.60Ca0.38Al1.38Si2.62O8
G = -129886.09 (J) H = -104823.81 (J) S = 18.52 (J/K) V = 2.94 (cc) Cp = 9.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.85 | 38.05 | 2.09 |

Total solids mass = 18.04 (gm) density = 3.02 (gm/cc)
G = -278122.23 (J) H = -221250.38 (J) S = 42.03 (J/K) V = 5.97 (cc) Cp = 21.54 (J/K)

Viscosity of the System: 5.60 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1617785.30 (J) H = -1269241.48 (J) S = 257.58 (J/K) V = 38.71 (cc) Cp = 132.57 (J/K)

Oxygen delta moles = -0.000678743 delta grams = -0.021719
G = 209.63 (J) H = -23.92 (J) S = -0.17 (J/K) V = -76.36 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1070.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.87 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 78.48 (gm) density = 2.50 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1282186.97 (J) H = -1005702.61 (J) S = 205.85 (J/K) V = 31.42 (cc) Cp = 106.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.50 | 0.81 | 14.13 | 0.74 | 0.00 | 3.34 | 0.14 | 0.87 | 0.00 | 0.00 | 3.97 | 3.93 | 2.09 | 0.21 | 1.29 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.39 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.70Mg1.16Fe'''0.02Ti0.00Al0.11Si1.93O6
G = -5610.49 (J) H = -4425.77 (J) S = 0.88 (J/K) V = 0.11 (cc) Cp = 0.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.83 | 93.12 | 70.44 | 4.45 | -4.16 | 6.55 | 0.43 |

clinopyroxene mass = 10.73 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.72Mg1.00Fe'''0.04Ti0.00Al0.15Si1.91O6
G = -152964.84 (J) H = -120318.33 (J) S = 24.31 (J/K) V = 3.15 (cc) Cp = 12.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.51 | 82.14 | 71.81 | 5.54 | -4.93 | 8.60 | 1.36 |

feldspar mass = 10.37 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.61Ca0.37Al1.37Si2.63O8
G = -174398.68 (J) H = -141055.62 (J) S = 24.82 (J/K) V = 3.95 (cc) Cp = 12.67 (J/K)

albite anorthite sanidine
60.61 37.19 2.20

Total solids mass = 21.49 (gm) density = 2.98 (gm/cc)
G = -332974.02 (J) H = -265799.72 (J) S = 50.01 (J/K) V = 7.21 (cc) Cp = 25.66 (J/K)

Viscosity of the System: 5.79 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1615160.99 (J) H = -1271502.32 (J) S = 255.86 (J/K) V = 38.63 (cc) Cp = 131.79 (J/K)

Oxygen delta moles = -0.000783703 delta grams = -0.0250776
G = 240.06 (J) H = -27.34 (J) S = -0.20 (J/K) V = -87.52 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1060.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.84 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 75.28 (gm) density = 2.49 (gm/cc) viscosity = 5.48 (log 10 poise) (analysis in wt %)
G = -1229095.65 (J) H = -966640.15 (J) S = 196.87 (J/K) V = 30.20 (cc) Cp = 101.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.98 | 0.84 | 13.87 | 0.72 | 0.00 | 3.21 | 0.15 | 0.79 | 0.00 | 0.00 | 3.88 | 3.85 | 2.16 | 0.21 | 1.34 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.55 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.73Mg1.13Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -7857.67 (J) H = -6208.05 (J) S = 1.24 (J/K) V = 0.16 (cc) Cp = 0.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.23 | 93.21 | 72.82 | 4.40 | -4.11 | 6.49 | 0.43 |

clinopyroxene mass = 11.30 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.74Mg0.98Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -159902.77 (J) H = -125984.49 (J) S = 25.44 (J/K) V = 3.30 (cc) Cp = 13.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.50 | 82.10 | 73.93 | 5.44 | -4.82 | 8.49 | 1.37 |

feldspar mass = 12.84 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.61Ca0.36Al1.36Si2.64O8
G = -215697.70 (J) H = -174842.67 (J) S = 30.65 (J/K) V = 4.90 (cc) Cp = 15.68 (J/K)

albite anorthite sanidine
61.28 36.42 2.30

Total solids mass = 24.69 (gm) density = 2.95 (gm/cc)
G = -383458.14 (J) H = -307035.21 (J) S = 57.33 (J/K) V = 8.36 (cc) Cp = 29.47 (J/K)

Viscosity of the System: 5.97 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1612553.79 (J) H = -1273675.36 (J) S = 254.19 (J/K) V = 38.55 (cc) Cp = 131.07 (J/K)

Oxygen delta moles = -0.000888476 delta grams = -0.0284302
G = 269.90 (J) H = -30.67 (J) S = -0.23 (J/K) V = -98.48 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1050.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.12 COH = 1.82 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 72.32 (gm) density = 2.49 (gm/cc) viscosity = 5.57 (log 10 poise) (analysis in wt %)
G = -1180026.90 (J) H = -930540.47 (J) S = 188.55 (J/K) V = 29.06 (cc) Cp = 97.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.45 | 0.88 | 13.62 | 0.69 | 0.00 | 3.08 | 0.15 | 0.73 | 0.00 | 0.00 | 3.79 | 3.77 | 2.23 | 0.22 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.88 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.75Mg1.11Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -12478.00 (J) H = -9874.20 (J) S = 1.97 (J/K) V = 0.26 (cc) Cp = 1.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.55 | 93.29 | 75.11 | 4.35 | -4.05 | 6.43 | 0.42 |

clinopyroxene mass = 11.62 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.76Mg0.96Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -163439.50 (J) H = -128993.48 (J) S = 26.03 (J/K) V = 3.39 (cc) Cp = 13.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.31 | 81.99 | 75.94 | 5.34 | -4.70 | 8.37 | 1.38 |

feldspar mass = 15.15 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.62Ca0.36Al1.36Si2.64O8
G = -254018.96 (J) H = -206360.60 (J) S = 36.02 (J/K) V = 5.78 (cc) Cp = 18.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.87 | 35.73 | 2.40 |

Total solids mass = 27.64 (gm) density = 2.94 (gm/cc)
G = -429936.46 (J) H = -345228.28 (J) S = 64.02 (J/K) V = 9.42 (cc) Cp = 32.98 (J/K)

Viscosity of the System: 6.16 (log 10 poise)

System mass = 99.97 (gm) density = 2.60 (gm/cc)
G = -1609963.36 (J) H = -1275768.75 (J) S = 252.58 (J/K) V = 38.48 (cc) Cp = 130.40 (J/K)

Oxygen delta moles = -0.000992749 delta grams = -0.0317668
G = 299.05 (J) H = -33.92 (J) S = -0.25 (J/K) V = -109.21 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1040.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.11 COH = 1.80 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 69.58 (gm) density = 2.48 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1134649.30 (J) H = -897162.68 (J) S = 180.85 (J/K) V = 28.01 (cc) Cp = 93.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.91 | 0.91 | 13.38 | 0.66 | 0.00 | 2.94 | 0.16 | 0.67 | 0.00 | 0.00 | 3.72 | 3.68 | 2.30 | 0.23 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.36 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.77Mg1.09Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -19158.53 (J) H = -15185.77 (J) S = 3.03 (J/K) V = 0.39 (cc) Cp = 1.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.77 | 93.37 | 77.33 | 4.29 | -4.00 | 6.36 | 0.42 |

clinopyroxene mass = 11.73 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.78Mg0.94Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -164003.10 (J) H = -129671.05 (J) S = 26.14 (J/K) V = 3.41 (cc) Cp = 13.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.92 | 81.80 | 77.83 | 5.24 | -4.58 | 8.24 | 1.39 |

feldspar mass = 17.29 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.62Ca0.35Al1.35Si2.65O8
G = -289578.52 (J) H = -235770.79 (J) S = 40.98 (J/K) V = 6.59 (cc) Cp = 21.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.40 | 35.11 | 2.49 |

Total solids mass = 30.38 (gm) density = 2.92 (gm/cc)
G = -472740.16 (J) H = -380627.61 (J) S = 70.15 (J/K) V = 10.40 (cc) Cp = 36.38 (J/K)

Viscosity of the System: 6.35 (log 10 poise)

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1607389.46 (J) H = -1277790.29 (J) S = 251.00 (J/K) V = 38.41 (cc) Cp = 129.95 (J/K)

Oxygen delta moles = -0.00109615 delta grams = -0.0350755
G = 327.43 (J) H = -37.05 (J) S = -0.28 (J/K) V = -119.68 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1030.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.10 COH = 1.78 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 67.05 (gm) density = 2.48 (gm/cc) viscosity = 5.76 (log 10 poise) (analysis in wt %)
G = -1092650.85 (J) H = -866279.31 (J) S = 173.71 (J/K) V = 27.04 (cc) Cp = 89.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.35 | 0.94 | 13.14 | 0.64 | 0.00 | 2.79 | 0.17 | 0.61 | 0.00 | 0.00 | 3.66 | 3.58 | 2.37 | 0.24 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.97 (gm) density = 3.46 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.06Fe"0.79Mg1.07Fe'''0.02Ti0.00Al0.11Si1.93O6
G = -27527.41 (J) H = -21856.52 (J) S = 4.35 (J/K) V = 0.57 (cc) Cp = 2.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.88 | 93.44 | 79.46 | 4.24 | -3.94 | 6.28 | 0.41 |

clinopyroxene mass = 11.66 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.80Mg0.92Fe'''0.04Ti0.00Al0.15Si1.91O6
G = -162070.77 (J) H = -128383.24 (J) S = 25.85 (J/K) V = 3.38 (cc) Cp = 13.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.31 | 81.53 | 79.60 | 5.14 | -4.47 | 8.10 | 1.41 |

feldspar mass = 19.29 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.35Al1.35Si2.65O8
G = -322582.88 (J) H = -263228.37 (J) S = 45.55 (J/K) V = 7.36 (cc) Cp = 23.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.86 | 34.56 | 2.58 |

Total solids mass = 32.92 (gm) density = 2.91 (gm/cc)
G = -512181.06 (J) H = -413468.13 (J) S = 75.75 (J/K) V = 11.31 (cc) Cp = 39.40 (J/K)

Viscosity of the System: 6.54 (log 10 poise)

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1604831.90 (J) H = -1279747.44 (J) S = 249.46 (J/K) V = 38.35 (cc) Cp = 129.39 (J/K)

Oxygen delta moles = -0.00119827 delta grams = -0.0383432
G = 354.90 (J) H = -40.07 (J) S = -0.30 (J/K) V = -129.83 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1020.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.10 COH = 1.76 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 64.69 (gm) density = 2.48 (gm/cc) viscosity = 5.86 (log 10 poise) (analysis in wt %)
G = -1053752.78 (J) H = -837687.50 (J) S = 167.08 (J/K) V = 26.13 (cc) Cp = 86.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.79 | 0.98 | 12.90 | 0.61 | 0.00 | 2.65 | 0.17 | 0.56 | 0.00 | 0.00 | 3.60 | 3.49 | 2.44 | 0.25 | 1.56 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.67 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.81Mg1.05Fe'''0.02Ti0.00Al0.11Si1.94O6
G = -37174.51 (J) H = -29568.34 (J) S = 5.88 (J/K) V = 0.77 (cc) Cp = 3.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.88 | 93.50 | 81.48 | 4.19 | -3.89 | 6.20 | 0.40 |

clinopyroxene mass = 11.44 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.81Mg0.90Fe'''0.04Ti0.00Al0.14Si1.91O6
G = -158149.79 (J) H = -125521.85 (J) S = 25.23 (J/K) V = 3.31 (cc) Cp = 13.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.47 | 81.17 | 81.22 | 5.05 | -4.35 | 7.96 | 1.42 |

feldspar mass = 21.15 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -353213.49 (J) H = -288867.28 (J) S = 49.76 (J/K) V = 8.07 (cc) Cp = 25.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.27 | 34.06 | 2.67 |

Total solids mass = 35.27 (gm) density = 2.90 (gm/cc)
G = -548537.79 (J) H = -443957.47 (J) S = 80.87 (J/K) V = 12.15 (cc) Cp = 42.18 (J/K)

Viscosity of the System: 6.73 (log 10 poise)

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1602290.57 (J) H = -1281644.97 (J) S = 247.96 (J/K) V = 38.28 (cc) Cp = 128.87 (J/K)

Oxygen delta moles = -0.00129864 delta grams = -0.0415549
G = 381.34 (J) H = -42.96 (J) S = -0.33 (J/K) V = -139.62 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 1010.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.09 COH = 1.73 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 60.44 (gm) density = 2.47 (gm/cc) viscosity = 5.86 (log 10 poise) (analysis in wt %)
G = -983623.84 (J) H = -783516.37 (J) S = 155.95 (J/K) V = 24.45 (cc) Cp = 80.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.76 | 1.04 | 12.85 | 0.59 | 0.00 | 2.54 | 0.18 | 0.52 | 0.00 | 0.00 | 3.55 | 3.45 | 2.58 | 0.27 | 1.67 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.48 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.83Mg1.04Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -34324.71 (J) H = -27355.05 (J) S = 5.43 (J/K) V = 0.71 (cc) Cp = 2.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.53 | 93.57 | 83.06 | 4.20 | -3.88 | 6.19 | 0.40 |

clinopyroxene mass = 12.26 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.82Mg0.89Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -168755.94 (J) H = -134231.86 (J) S = 26.91 (J/K) V = 3.54 (cc) Cp = 14.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.05 | 80.62 | 82.29 | 5.05 | -4.29 | 7.91 | 1.47 |

feldspar mass = 23.41 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -390327.73 (J) H = -319934.93 (J) S = 54.86 (J/K) V = 8.93 (cc) Cp = 28.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.49 | 33.68 | 2.83 |

quartz mass = 1.36 (gm) density = 2.56 (gm/cc)
SiO2
G = -22740.14 (J) H = -18842.76 (J) S = 3.04 (J/K) V = 0.53 (cc) Cp = 1.62 (J/K)

Total solids mass = 39.51 (gm) density = 2.88 (gm/cc)
G = -616148.52 (J) H = -500364.61 (J) S = 90.23 (J/K) V = 13.72 (cc) Cp = 47.21 (J/K)

Viscosity of the System: 6.97 (log 10 poise)

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1599772.36 (J) H = -1283880.98 (J) S = 246.18 (J/K) V = 38.17 (cc) Cp = 128.19 (J/K)

Oxygen delta moles = -0.00138668 delta grams = -0.0443722
G = 403.69 (J) H = -45.38 (J) S = -0.35 (J/K) V = -147.94 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 56.61 (gm) density = 2.47 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -920518.41 (J) H = -734722.06 (J) S = 145.93 (J/K) V = 22.94 (cc) Cp = 75.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.71 | 1.11 | 12.81 | 0.57 | 0.00 | 2.43 | 0.20 | 0.49 | 0.00 | 0.00 | 3.49 | 3.40 | 2.72 | 0.29 | 1.78 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.51 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.85Mg1.02Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -34488.29 (J) H = -27540.36 (J) S = 5.46 (J/K) V = 0.72 (cc) Cp = 2.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.10 | 93.63 | 84.56 | 4.21 | -3.87 | 6.18 | 0.40 |

clinopyroxene mass = 12.79 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.83Mg0.87Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -175360.93 (J) H = -139800.12 (J) S = 27.93 (J/K) V = 3.69 (cc) Cp = 14.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.37 | 79.96 | 83.20 | 5.06 | -4.22 | 7.86 | 1.52 |

feldspar mass = 25.44 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.64Ca0.33Al1.33Si2.67O8
G = -423567.48 (J) H = -347957.42 (J) S = 59.39 (J/K) V = 9.71 (cc) Cp = 31.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.67 | 33.33 | 3.00 |

quartz mass = 2.60 (gm) density = 2.56 (gm/cc)
SiO2
G = -43339.39 (J) H = -35990.39 (J) S = 5.77 (J/K) V = 1.02 (cc) Cp = 3.09 (J/K)

Total solids mass = 43.34 (gm) density = 2.86 (gm/cc)
G = -676756.10 (J) H = -551288.29 (J) S = 98.55 (J/K) V = 15.13 (cc) Cp = 51.73 (J/K)

Viscosity of the System: 7.24 (log 10 poise)

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1597274.51 (J) H = -1286010.35 (J) S = 244.48 (J/K) V = 38.07 (cc) Cp = 127.57 (J/K)

Oxygen delta moles = -0.00146932 delta grams = -0.0470165
G = 424.04 (J) H = -47.55 (J) S = -0.37 (J/K) V = -155.53 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 990.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.68 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 53.18 (gm) density = 2.46 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -863957.85 (J) H = -690963.61 (J) S = 136.95 (J/K) V = 21.58 (cc) Cp = 71.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.65 | 1.17 | 12.77 | 0.55 | 0.00 | 2.32 | 0.21 | 0.46 | 0.00 | 0.00 | 3.44 | 3.36 | 2.87 | 0.30 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.72 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.86Mg1.01Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -37284.85 (J) H = -29834.13 (J) S = 5.90 (J/K) V = 0.78 (cc) Cp = 3.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.60 | 93.69 | 85.99 | 4.23 | -3.87 | 6.16 | 0.40 |

clinopyroxene mass = 13.07 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.84Mg0.85Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -178474.71 (J) H = -142613.91 (J) S = 28.39 (J/K) V = 3.76 (cc) Cp = 14.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.43 | 79.18 | 83.96 | 5.07 | -4.15 | 7.80 | 1.58 |

feldspar mass = 27.27 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.64Ca0.33Al1.33Si2.67O8
G = -453320.97 (J) H = -373233.09 (J) S = 63.40 (J/K) V = 10.40 (cc) Cp = 33.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.84 | 33.00 | 3.16 |

quartz mass = 3.71 (gm) density = 2.56 (gm/cc)
SiO2
G = -61757.65 (J) H = -51397.82 (J) S = 8.20 (J/K) V = 1.45 (cc) Cp = 4.41 (J/K)

Total solids mass = 46.77 (gm) density = 2.85 (gm/cc)
G = -730838.18 (J) H = -597078.95 (J) S = 105.89 (J/K) V = 16.40 (cc) Cp = 55.77 (J/K)

Viscosity of the System: 7.60 (log 10 poise)

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1594796.03 (J) H = -1288042.55 (J) S = 242.85 (J/K) V = 37.98 (cc) Cp = 127.00 (J/K)

Oxygen delta moles = -0.00154706 delta grams = -0.0495041
G = 442.58 (J) H = -49.52 (J) S = -0.39 (J/K) V = -162.48 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 980.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.66  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 50.10 (gm)  density = 2.46 (gm/cc)  viscosity = 5.87 (log 10 poise)  (analysis in wt %)
G = -812983.94 (J)  H = -651458.39 (J)  S = 128.90 (J/K)  V = 20.36 (cc)  Cp = 67.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.54 | 1.22 | 12.77 | 0.54 | 0.00 | 2.26 | 0.22 | 0.42 | 0.00 | 0.00 | 3.37 | 3.31 | 3.01 | 0.32 | 2.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.86 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.89Mg0.98Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -79603.21 (J)  H = -63788.84 (J)  S = 12.62 (J/K)  V = 1.67 (cc)  Cp = 6.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.70 | 93.92 | 88.71 | 4.32 | -3.94 | 6.30 | 0.39 |

clinopyroxene  mass = 9.30 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.86Mg0.83Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -126061.46 (J)  H = -100888.27 (J)  S = 20.09 (J/K)  V = 2.67 (cc)  Cp = 10.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.05 | 79.23 | 86.37 | 5.11 | -4.14 | 7.88 | 1.60 |

clinopyroxene  mass = 1.09 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.75Fe"0.43Mg0.59Fe'"0.07Ti0.04Al0.23Si1.85O6
G = -15870.79 (J)  H = -12958.67 (J)  S = 2.32 (J/K)  V = 0.32 (cc)  Cp = 1.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.86 | 19.45 | 42.74 | 8.66 | -1.56 | 8.18 | 5.68 |

feldspar  mass = 28.85 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.03Na0.64Ca0.33Al1.33Si2.67O8
G = -478824.63 (J)  H = -395105.83 (J)  S = 66.81 (J/K)  V = 11.00 (cc)  Cp = 35.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.10 | 32.56 | 3.34 |

quartz  mass = 4.76 (gm)  density = 2.56 (gm/cc)
SiO2
G = -79006.76 (J)  H = -65897.06 (J)  S = 10.46 (J/K)  V = 1.86 (cc)  Cp = 5.64 (J/K)

Total solids  mass = 49.85 (gm)  density = 2.84 (gm/cc)
G = -779366.86 (J)  H = -638638.67 (J)  S = 112.30 (J/K)  V = 17.53 (cc)  Cp = 59.40 (J/K)

Viscosity of the System: 8.12 (log 10 poise)

System  mass = 99.95 (gm)  density = 2.64 (gm/cc)
G = -1592350.80 (J)  H = -1290097.06 (J)  S = 241.20 (J/K)  V = 37.89 (cc)  Cp = 126.51 (J/K)

Oxygen  delta moles = -0.00159329  delta grams = -0.0509834
G = 451.80 (J)  H = -50.42 (J)  S = -0.40 (J/K)  V = -166.01 (cc)  Cp = -0.06 (J/K)

**********_____**********
Title: f6i2m2

T = 970.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.06  COH = 1.64  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 47.05 (gm)  density = 2.46 (gm/cc)  viscosity = 5.87 (log 10 poise)  (analysis in wt %)
G = -762678.55 (J)  H = -612314.70 (J)  S = 120.95 (J/K)  V = 19.15 (cc)  Cp = 63.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.48 | 1.17 | 12.81 | 0.54 | 0.00 | 2.22 | 0.23 | 0.37 | 0.00 | 0.00 | 3.27 | 3.27 | 3.16 | 0.34 | 2.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.27 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.92Mg0.95Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -151574.06 (J)  H = -121596.68 (J)  S = 24.11 (J/K)  V = 3.20 (cc)  Cp = 12.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.78 | 94.22 | 92.26 | 4.45 | -4.08 | 6.56 | 0.38 |

clinopyroxene  mass = 2.46 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.90Mg0.80Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -33090.53 (J)  H = -26511.27 (J)  S = 5.29 (J/K)  V = 0.70 (cc)  Cp = 2.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.19 | 79.76 | 89.85 | 5.12 | -4.18 | 8.06 | 1.59 |

clinopyroxene  mass = 2.88 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.75Fe"0.44Mg0.57Fe'"0.07Ti0.04Al0.23Si1.84O6
G = -41746.25 (J)  H = -34146.80 (J)  S = 6.11 (J/K)  V = 0.85 (cc)  Cp = 3.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.48 | 18.85 | 44.04 | 8.83 | -1.35 | 8.29 | 5.87 |

feldspar  mass = 30.34 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.04Na0.64Ca0.32Al1.32Si2.68O8
G = -502863.75 (J)  H = -415859.37 (J)  S = 69.99 (J/K)  V = 11.58 (cc)  Cp = 37.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.32 | 32.12 | 3.55 |

quartz  mass = 5.85 (gm)  density = 2.56 (gm/cc)
SiO2
G = -96937.62 (J)  H = -81028.85 (J)  S = 12.80 (J/K)  V = 2.29 (cc)  Cp = 6.92 (J/K)

rhm-oxide  mass = 0.10 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.70Mg0.12Fe'"0.18Al0.13Ti0.85O3
G = -1052.37 (J)  H = -797.82 (J)  S = 0.20 (J/K)  V = 0.02 (cc)  Cp = 0.10 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.72 | 9.22 | 69.88 | 2.93 | 6.25 |

Total solids  mass = 52.90 (gm)  density = 2.84 (gm/cc)
G = -827264.58 (J)  H = -679940.78 (J)  S = 118.51 (J/K)  V = 18.64 (cc)  Cp = 63.02 (J/K)

Viscosity of the System: 9.60 (log 10 poise)

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1589943.13 (J) H = -1292255.48 (J) S = 239.46 (J/K) V = 37.79 (cc) Cp = 126.03 (J/K)

Oxygen delta moles = -0.00160118 delta grams = -0.0512359
G = 450.01 (J) H = -50.10 (J) S = -0.40 (J/K) V = -165.50 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 960.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.05 COH = 1.61 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 44.13 (gm) density = 2.45 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -715043.13 (J) H = -575221.29 (J) S = 113.39 (J/K) V = 18.01 (cc) Cp = 59.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.47 | 1.09 | 12.87 | 0.51 | 0.00 | 2.11 | 0.24 | 0.34 | 0.00 | 0.00 | 3.17 | 3.22 | 3.32 | 0.37 | 2.29 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.24 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.93Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -176995.71 (J) H = -142258.72 (J) S = 28.17 (J/K) V = 3.75 (cc) Cp = 15.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.94 | 94.44 | 94.12 | 4.51 | -4.17 | 6.66 | 0.38 |

clinopyroxene mass = 3.75 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.76Fe"0.44Mg0.56Fe'"0.07Ti0.04Al0.23Si1.84O6
G = -54343.90 (J) H = -44552.87 (J) S = 7.94 (J/K) V = 1.10 (cc) Cp = 4.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.51 | 18.24 | 44.39 | 8.86 | -1.30 | 8.30 | 6.00 |

feldspar mass = 31.73 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.65Ca0.32Al1.32Si2.68O8
G = -525059.13 (J) H = -435172.91 (J) S = 72.89 (J/K) V = 12.11 (cc) Cp = 38.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.53 | 31.69 | 3.78 |

quartz mass = 6.87 (gm) density = 2.56 (gm/cc)
SiO2
G = -113720.42 (J) H = -95264.04 (J) S = 14.97 (J/K) V = 2.69 (cc) Cp = 8.13 (J/K)

rhm-oxide mass = 0.24 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.18Al0.12Ti0.85O3
G = -2385.62 (J) H = -1813.44 (J) S = 0.46 (J/K) V = 0.05 (cc) Cp = 0.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.35 | 9.24 | 70.21 | 3.05 | 6.16 |

Total solids mass = 55.82 (gm) density = 2.83 (gm/cc)
G = -872504.79 (J) H = -719061.99 (J) S = 124.43 (J/K) V = 19.70 (cc) Cp = 66.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1587547.92 (J) H = -1294283.27 (J) S = 237.82 (J/K) V = 37.70 (cc) Cp = 125.53 (J/K)

Oxygen delta moles = -0.00161779 delta grams = -0.0517674
G = 450.62 (J) H = -50.04 (J) S = -0.41 (J/K) V = -165.87 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 950.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.04 COH = 1.58 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 41.47 (gm) density = 2.44 (gm/cc) viscosity = 5.88 (log 10 poise) (analysis in wt %)
G = -671873.00 (J) H = -541595.82 (J) S = 106.51 (J/K) V = 16.96 (cc) Cp = 55.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.46 | 1.02 | 12.94 | 0.49 | 0.00 | 1.96 | 0.25 | 0.32 | 0.00 | 0.00 | 3.08 | 3.18 | 3.48 | 0.39 | 2.44 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.25 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.92Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -176522.02 (J) H = -142207.96 (J) S = 28.05 (J/K) V = 3.75 (cc) Cp = 15.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.02 | 94.62 | 95.02 | 4.56 | -4.23 | 6.68 | 0.37 |

clinopyroxene mass = 4.12 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.76Fe"0.44Mg0.55Fe'"0.07Ti0.04Al0.23Si1.84O6
G = -59634.50 (J) H = -49017.30 (J) S = 8.68 (J/K) V = 1.21 (cc) Cp = 4.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.35 | 17.51 | 44.10 | 8.96 | -1.25 | 8.21 | 6.12 |

feldspar mass = 32.98 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.65Ca0.31Al1.31Si2.69O8
G = -544909.91 (J) H = -452620.30 (J) S = 75.45 (J/K) V = 12.58 (cc) Cp = 40.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.73 | 31.26 | 4.01 |

quartz mass = 7.78 (gm) density = 2.56 (gm/cc)
SiO2
G = -128723.05 (J) H = -108065.64 (J) S = 16.89 (J/K) V = 3.04 (cc) Cp = 9.20 (J/K)

rhm-oxide mass = 0.35 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.18Al0.12Ti0.85O3
G = -3500.62 (J) H = -2669.15 (J) S = 0.68 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.17 | 9.14 | 70.44 | 3.18 | 6.07 |

Total solids mass = 58.48 (gm) density = 2.83 (gm/cc)
G = -913290.10 (J) H = -754580.35 (J) S = 129.75 (J/K) V = 20.67 (cc) Cp = 69.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1585163.11 (J) H = -1296176.16 (J) S = 236.26 (J/K) V = 37.63 (cc) Cp = 125.05 (J/K)

Oxygen delta moles = -0.00164468 delta grams = -0.0526277
G = 453.98 (J) H = -50.29 (J) S = -0.41 (J/K) V = -167.26 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 940.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.03 COH = 1.56 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 39.07 (gm) density = 2.44 (gm/cc) viscosity = 5.88 (log 10 poise) (analysis in wt %)
G = -632834.38 (J) H = -511159.65 (J) S = 100.30 (J/K) V = 16.02 (cc) Cp = 52.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.42 | 0.95 | 13.01 | 0.46 | 0.00 | 1.83 | 0.27 | 0.30 | 0.00 | 0.00 | 2.99 | 3.13 | 3.64 | 0.41 | 2.59 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.26 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.92Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -176093.65 (J) H = -142197.45 (J) S = 27.94 (J/K) V = 3.75 (cc) Cp = 15.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.02 | 94.80 | 95.84 | 4.61 | -4.29 | 6.70 | 0.36 |

clinopyroxene mass = 4.45 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.44Mg0.55Fe'"0.07Ti0.04Al0.23Si1.84O6
G = -64324.35 (J) H = -53009.76 (J) S = 9.33 (J/K) V = 1.31 (cc) Cp = 4.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.19 | 16.81 | 43.78 | 9.09 | -1.22 | 8.11 | 6.24 |

feldspar mass = 34.12 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.65Ca0.31Al1.31Si2.69O8
G = -562840.52 (J) H = -468543.20 (J) S = 77.73 (J/K) V = 13.02 (cc) Cp = 41.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.92 | 30.85 | 4.24 |

quartz mass = 8.61 (gm) density = 2.56 (gm/cc)
SiO2
G = -142259.64 (J) H = -119688.22 (J) S = 18.61 (J/K) V = 3.37 (cc) Cp = 10.17 (J/K)

rhm-oxide mass = 0.44 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.18Al0.12Ti0.85O3
G = -4440.56 (J) H = -3396.28 (J) S = 0.86 (J/K) V = 0.10 (cc) Cp = 0.42 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.00 | 9.03 | 70.67 | 3.31 | 5.99 |

Total solids mass = 60.88 (gm) density = 2.83 (gm/cc)
G = -949958.72 (J) H = -786834.91 (J) S = 134.46 (J/K) V = 21.54 (cc) Cp = 72.24 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1582793.10 (J) H = -1297994.56 (J) S = 234.76 (J/K) V = 37.56 (cc) Cp = 124.60 (J/K)

Oxygen delta moles = -0.00167251 delta grams = -0.0535183
G = 457.47 (J) H = -50.54 (J) S = -0.42 (J/K) V = -168.70 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 930.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.02 COH = 1.53 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 36.88 (gm) density = 2.43 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -597333.83 (J) H = -483453.23 (J) S = 94.65 (J/K) V = 15.16 (cc) Cp = 49.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.37 | 0.89 | 13.09 | 0.43 | 0.00 | 1.70 | 0.28 | 0.28 | 0.00 | 0.00 | 2.91 | 3.07 | 3.80 | 0.44 | 2.74 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.27 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.97Mg0.91Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -175696.15 (J) H = -142215.05 (J) S = 27.83 (J/K) V = 3.75 (cc) Cp = 15.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.96 | 94.97 | 96.60 | 4.67 | -4.36 | 6.72 | 0.36 |

clinopyroxene mass = 4.74 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.78Fe"0.43Mg0.54Fe'"0.07Ti0.04Al0.24Si1.84O6
G = -68508.50 (J) H = -56604.93 (J) S = 9.89 (J/K) V = 1.39 (cc) Cp = 5.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.03 | 16.14 | 43.44 | 9.22 | -1.19 | 8.00 | 6.36 |

feldspar mass = 35.16 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.65Ca0.30Al1.30Si2.70O8
G = -579115.20 (J) H = -483151.51 (J) S = 79.76 (J/K) V = 13.41 (cc) Cp = 42.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.08 | 30.45 | 4.47 |

quartz mass = 9.37 (gm) density = 2.56 (gm/cc)
SiO2
G = -154548.53 (J) H = -130307.82 (J) S = 20.15 (J/K) V = 3.66 (cc) Cp = 11.06 (J/K)

rhm-oxide mass = 0.52 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.18Al0.12Ti0.85O3
G = -5235.39 (J) H = -4016.63 (J) S = 1.01 (J/K) V = 0.11 (cc) Cp = 0.50 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.84 | 8.92 | 70.89 | 3.44 | 5.91 |

Total solids mass = 63.06 (gm) density = 2.82 (gm/cc)
G = -983103.78 (J) H = -816295.95 (J) S = 138.64 (J/K) V = 22.33 (cc) Cp = 74.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.67 (gm/cc)
G = -1580437.61 (J) H = -1299749.18 (J) S = 233.29 (J/K) V = 37.49 (cc) Cp = 124.19 (J/K)

Oxygen delta moles = -0.001701 delta grams = -0.0544299
G = 461.01 (J) H = -50.79 (J) S = -0.43 (J/K) V = -170.16 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 920.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.02 COH = 1.50 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 34.89 (gm) density = 2.43 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -564882.70 (J) H = -458098.11 (J) S = 89.50 (J/K) V = 14.37 (cc) Cp = 46.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.29 | 0.84 | 13.17 | 0.40 | 0.00 | 1.58 | 0.29 | 0.27 | 0.00 | 0.00 | 2.84 | 3.02 | 3.95 | 0.46 | 2.89 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.29 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.91Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -175320.81 (J) H = -142253.20 (J) S = 27.71 (J/K) V = 3.75 (cc) Cp = 15.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.85 | 95.15 | 97.31 | 4.73 | -4.43 | 6.74 | 0.35 |

clinopyroxene mass = 5.01 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.78Fe"0.43Mg0.54Fe'"0.07Ti0.04Al0.24Si1.84O6
G = -72263.01 (J) H = -59862.51 (J) S = 10.39 (J/K) V = 1.47 (cc) Cp = 5.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.86 | 15.49 | 43.07 | 9.37 | -1.17 | 7.90 | 6.47 |

feldspar mass = 36.11 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -593952.57 (J) H = -496618.91 (J) S = 81.58 (J/K) V = 13.78 (cc) Cp = 43.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.23 | 30.07 | 4.70 |

quartz mass = 10.06 (gm) density = 2.56 (gm/cc)
SiO2
G = -165768.46 (J) H = -140068.65 (J) S = 21.54 (J/K) V = 3.93 (cc) Cp = 11.86 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.18Al0.12Ti0.85O3
G = -5908.84 (J) H = -4547.45 (J) S = 1.14 (J/K) V = 0.13 (cc) Cp = 0.56 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.69 | 8.79 | 71.10 | 3.57 | 5.84 |

Total solids mass = 65.06 (gm) density = 2.82 (gm/cc)
G = -1013213.68 (J) H = -843350.72 (J) S = 142.37 (J/K) V = 23.06 (cc) Cp = 77.01 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1578096.39 (J) H = -1301448.83 (J) S = 231.86 (J/K) V = 37.43 (cc) Cp = 123.81 (J/K)

Oxygen delta moles = -0.00172993 delta grams = -0.0553556
G = 464.52 (J) H = -51.04 (J) S = -0.43 (J/K) V = -171.61 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 910.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.01 COH = 1.48 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 33.06 (gm) density = 2.42 (gm/cc) viscosity = 5.86 (log 10 poise) (analysis in wt %)
G = -535074.65 (J) H = -434779.50 (J) S = 84.77 (J/K) V = 13.64 (cc) Cp = 44.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.19 | 0.78 | 13.26 | 0.38 | 0.00 | 1.47 | 0.30 | 0.25 | 0.00 | 0.00 | 2.77 | 2.96 | 4.10 | 0.49 | 3.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.30 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.90Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -174962.69 (J) H = -142307.49 (J) S = 27.60 (J/K) V = 3.75 (cc) Cp = 15.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.68 | 95.32 | 97.97 | 4.79 | -4.51 | 6.76 | 0.35 |

clinopyroxene mass = 5.24 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.79Fe"0.43Mg0.54Fe'"0.07Ti0.04Al0.24Si1.84O6
G = -75649.40 (J) H = -62830.77 (J) S = 10.83 (J/K) V = 1.54 (cc) Cp = 5.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.69 | 14.88 | 42.69 | 9.53 | -1.15 | 7.79 | 6.58 |

feldspar mass = 36.99 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -607535.33 (J) H = -509090.51 (J) S = 83.21 (J/K) V = 14.11 (cc) Cp = 44.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.35 | 29.71 | 4.94 |

quartz mass = 10.70 (gm) density = 2.56 (gm/cc)
SiO2
G = -176067.27 (J) H = -149090.03 (J) S = 22.80 (J/K) V = 4.18 (cc) Cp = 12.61 (J/K)

rhm-oxide mass = 0.65 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.17Al0.12Ti0.86O3
G = -6479.88 (J) H = -5002.54 (J) S = 1.25 (J/K) V = 0.14 (cc) Cp = 0.62 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.55 | 8.66 | 71.32 | 3.69 | 5.77 |

Total solids mass = 66.88 (gm) density = 2.82 (gm/cc)
G = -1040694.56 (J) H = -868321.33 (J) S = 145.69 (J/K) V = 23.73 (cc) Cp = 79.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1575769.22 (J) H = -1303100.84 (J) S = 230.46 (J/K) V = 37.37 (cc) Cp = 123.46 (J/K)

Oxygen delta moles = -0.00175912 delta grams = -0.0562897
G = 467.97 (J) H = -51.28 (J) S = -0.44 (J/K) V = -173.05 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 31.35 (gm) density = 2.42 (gm/cc) viscosity = 5.85 (log 10 poise) (analysis in wt %)
G = -507310.95 (J) H = -413020.12 (J) S = 80.37 (J/K) V = 12.96 (cc) Cp = 42.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.09 | 0.73 | 13.35 | 0.36 | 0.00 | 1.36 | 0.31 | 0.23 | 0.00 | 0.00 | 2.69 | 2.90 | 4.25 | 0.50 | 3.22 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.31 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.90Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -174637.91 (J) H = -142390.78 (J) S = 27.49 (J/K) V = 3.75 (cc) Cp = 15.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.48 | 95.50 | 98.58 | 4.86 | -4.59 | 6.79 | 0.34 |

clinopyroxene mass = 5.46 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.79Fe"0.42Mg0.53Fe'"0.07Ti0.04Al0.24Si1.84O6
G = -78685.62 (J) H = -65522.23 (J) S = 11.22 (J/K) V = 1.60 (cc) Cp = 6.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.50 | 14.28 | 42.29 | 9.71 | -1.14 | 7.67 | 6.69 |

feldspar mass = 37.81 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.65Ca0.29Al1.29Si2.71O8
G = -620058.61 (J) H = -520723.08 (J) S = 84.67 (J/K) V = 14.43 (cc) Cp = 45.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.45 | 29.37 | 5.18 |

quartz mass = 11.30 (gm) density = 2.56 (gm/cc)
SiO2
G = -185628.07 (J) H = -157522.29 (J) S = 23.96 (J/K) V = 4.42 (cc) Cp = 13.30 (J/K)

rhm-oxide mass = 0.70 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.17Al0.11Ti0.86O3
G = -6968.34 (J) H = -5396.53 (J) S = 1.34 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.42 | 8.53 | 71.54 | 3.81 | 5.71 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -166.26 (J) H = -137.98 (J) S = 0.02 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 68.59 (gm) density = 2.82 (gm/cc)

G = -1066144.82 (J)  H = -891692.89 (J)  S = 148.70 (J/K)  V = 24.35 (cc)  Cp = 81.02 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.68 (gm/cc)
G = -1573455.77 (J)  H = -1304713.01 (J)  S = 229.08 (J/K)  V = 37.32 (cc)  Cp = 123.12 (J/K)

Oxygen  delta moles = -0.00178874  delta grams = -0.0572375
G = 471.39 (J)  H = -51.50 (J)  S = -0.45 (J/K)  V = -174.47 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 890.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.07  delta HM = -5.05  NNO = 0.00  QFM = -0.01  COH = 1.42  IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid  mass = 29.77 (gm)  density = 2.41 (gm/cc)  viscosity = 5.84 (log 10 poise)  (analysis in wt %)
G = -481451.46 (J)  H = -392717.35 (J)  S = 76.29 (J/K)  V = 12.33 (cc)  Cp = 39.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.98 | 0.69 | 13.46 | 0.33 | 0.00 | 1.26 | 0.33 | 0.22 | 0.00 | 0.00 | 2.61 | 2.83 | 4.40 | 0.50 | 3.39 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 13.32 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.89Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -174336.52 (J)  H = -142494.69 (J)  S = 27.38 (J/K)  V = 3.75 (cc)  Cp = 15.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.24 | 95.67 | 99.16 | 4.93 | -4.67 | 6.82 | 0.33 |

clinopyroxene  mass = 5.65 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.42Mg0.53Fe'"0.06Ti0.04Al0.24Si1.84O6
G = -81426.80 (J)  H = -67980.57 (J)  S = 11.56 (J/K)  V = 1.66 (cc)  Cp = 6.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.30 | 13.70 | 41.87 | 9.90 | -1.14 | 7.56 | 6.80 |

feldspar  mass = 38.57 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.66Ca0.29Al1.29Si2.71O8
G = -631624.90 (J)  H = -531597.00 (J)  S = 86.00 (J/K)  V = 14.72 (cc)  Cp = 46.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.54 | 29.03 | 5.43 |

quartz  mass = 11.85 (gm)  density = 2.56 (gm/cc)
SiO2
G = -194515.30 (J)  H = -165416.16 (J)  S = 25.02 (J/K)  V = 4.63 (cc)  Cp = 13.94 (J/K)

rhm-oxide  mass = 0.74 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.17Al0.11Ti0.86O3
G = -7383.63 (J)  H = -5736.12 (J)  S = 1.42 (J/K)  V = 0.16 (cc)  Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.28 | 8.39 | 71.75 | 3.93 | 5.65 |

apatite  mass = 0.03 (gm)  density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -417.37 (J)  H = -347.21 (J)  S = 0.06 (J/K)  V = 0.01 (cc)  Cp = 0.03 (J/K)

Total solids  mass = 70.17 (gm)  density = 2.81 (gm/cc)
G = -1089704.52 (J)  H = -913571.74 (J)  S = 151.43 (J/K)  V = 24.93 (cc)  Cp = 82.81 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.68 (gm/cc)
G = -1571155.98 (J)  H = -1306289.09 (J)  S = 227.72 (J/K)  V = 37.26 (cc)  Cp = 122.79 (J/K)

Oxygen  delta moles = -0.00181851  delta grams = -0.0581902
G = 474.71 (J)  H = -51.72 (J)  S = -0.45 (J/K)  V = -175.86 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 880.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.26  delta HM = -5.06  NNO = 0.00  QFM = -0.02  COH = 1.39
IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid  mass = 28.29 (gm)  density = 2.41 (gm/cc)  viscosity = 5.83 (log 10 poise)  (analysis in wt %)
G = -457440.78 (J)  H = -373837.80 (J)  S = 72.50 (J/K)  V = 11.74 (cc)  Cp = 38.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.85 | 0.64 | 13.57 | 0.31 | 0.00 | 1.17 | 0.34 | 0.21 | 0.00 | 0.00 | 2.53 | 2.77 | 4.54 | 0.51 | 3.57 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 13.34 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.89Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -174045.27 (J)  H = -142608.07 (J)  S = 27.26 (J/K)  V = 3.75 (cc)  Cp = 15.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.97 | 95.84 | 99.70 | 5.01 | -4.76 | 6.85 | 0.33 |

clinopyroxene  mass = 5.83 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.41Mg0.53Fe'"0.06Ti0.04Al0.24Si1.84O6
G = -83932.21 (J)  H = -70253.39 (J)  S = 11.86 (J/K)  V = 1.71 (cc)  Cp = 6.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.09 | 13.14 | 41.44 | 10.11 | -1.13 | 7.44 | 6.90 |

feldspar  mass = 39.29 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.06Na0.66Ca0.29Al1.29Si2.71O8
G = -642317.29 (J)  H = -541777.10 (J)  S = 87.19 (J/K)  V = 14.99 (cc)  Cp = 47.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.61 | 28.71 | 5.68 |

quartz  mass = 12.37 (gm)  density = 2.56 (gm/cc)
SiO2
G = -202773.38 (J)  H = -172805.78 (J)  S = 25.99 (J/K)  V = 4.84 (cc)  Cp = 14.53 (J/K)

rhm-oxide  mass = 0.78 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.16Al0.11Ti0.86O3
G = -7732.46 (J)  H = -6026.01 (J)  S = 1.48 (J/K)  V = 0.17 (cc)  Cp = 0.74 (J/K)

geikielite hematite ilmenite pyrophanite corundum
10.16 8.24 71.96 4.05 5.59

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -628.46 (J) H = -524.05 (J) S = 0.09 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

Total solids mass = 71.65 (gm) density = 2.81 (gm/cc)
G = -1111429.06 (J) H = -933994.41 (J) S = 153.87 (J/K) V = 25.47 (cc) Cp = 84.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1568869.84 (J) H = -1307832.21 (J) S = 226.37 (J/K) V = 37.21 (cc) Cp = 122.48 (J/K)

Oxygen delta moles = -0.00184814 delta grams = -0.0591381
G = 477.85 (J) H = -51.90 (J) S = -0.46 (J/K) V = -177.19 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 26.92 (gm) density = 2.40 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -434946.55 (J) H = -356111.17 (J) S = 68.96 (J/K) V = 11.19 (cc) Cp = 36.19 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.72 0.60 13.65 0.29 0.00 1.08 0.35 0.20 0.00 0.00 2.45 2.72 4.68 0.51 3.75 0.00 0.00 0.00 0.00

garnet mass = 0.26 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -3567.73 (J) H = -2975.34 (J) S = 0.52 (J/K) V = 0.07 (cc) Cp = 0.28 (J/K)
almandine grossular pyrope
58.50 17.92 23.58

orthopyroxene mass = 13.16 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.89Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -171432.51 (J) H = -140831.05 (J) S = 26.77 (J/K) V = 3.70 (cc) Cp = 14.89 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.33 95.99 99.94 5.06 -4.82 6.84 0.32

clinopyroxene mass = 6.01 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.41Mg0.53Fe'"0.06Ti0.05Al0.25Si1.84O6
G = -86623.24 (J) H = -72697.60 (J) S = 12.18 (J/K) V = 1.77 (cc) Cp = 6.66 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
23.09 12.59 40.84 10.30 -1.11 7.27 7.01

feldspar mass = 39.82 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.66Ca0.28Al1.28Si2.72O8
G = -650093.97 (J) H = -549522.11 (J) S = 87.98 (J/K) V = 15.20 (cc) Cp = 48.19 (J/K)

albite anorthite sanidine
65.78 28.26 5.96

quartz mass = 12.90 (gm) density = 2.56 (gm/cc)
SiO2
G = -211104.23 (J) H = -180287.16 (J) S = 26.96 (J/K) V = 5.04 (cc) Cp = 15.14 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.16Al0.11Ti0.86O3
G = -8019.08 (J) H = -6269.39 (J) S = 1.53 (J/K) V = 0.18 (cc) Cp = 0.76 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.08 8.08 72.15 4.17 5.52

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -805.46 (J) H = -673.23 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 73.02 (gm) density = 2.81 (gm/cc)
G = -1131646.21 (J) H = -953255.89 (J) S = 156.05 (J/K) V = 25.96 (cc) Cp = 86.00 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1566592.76 (J) H = -1309367.06 (J) S = 225.01 (J/K) V = 37.15 (cc) Cp = 122.18 (J/K)

Oxygen delta moles = -0.00188603 delta grams = -0.0603507
G = 482.96 (J) H = -52.30 (J) S = -0.47 (J/K) V = -179.26 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 25.58 (gm) density = 2.40 (gm/cc) viscosity = 5.77 (log 10 poise) (analysis in wt %)
G = -413170.27 (J) H = -338855.77 (J) S = 65.58 (J/K) V = 10.66 (cc) Cp = 34.40 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.66 0.56 13.59 0.27 0.00 0.98 0.37 0.19 0.00 0.00 2.36 2.76 4.80 0.52 3.94 0.00 0.00 0.00 0.00

garnet mass = 1.91 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -25852.85 (J) H = -21613.37 (J) S = 3.74 (J/K) V = 0.48 (cc) Cp = 2.07 (J/K)
almandine grossular pyrope
58.35 17.86 23.79

orthopyroxene mass = 12.00 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.90Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -156538.04 (J) H = -129006.27 (J) S = 24.30 (J/K) V = 3.37 (cc) Cp = 13.59 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.81 96.07 98.64 4.92 -4.70 6.55 0.33

clinopyroxene mass = 6.32 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.39Mg0.54Fe'"0.06Ti0.05Al0.24Si1.84O6
G = -91236.56 (J) H = -76798.53 (J) S = 12.74 (J/K) V = 1.86 (cc) Cp = 7.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.32 | 12.01 | 39.42 | 10.26 | -1.00 | 6.82 | 7.17 |

feldspar mass = 39.64 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.67Ca0.27Al1.27Si2.73O8
G = -646071.84 (J) H = -547245.41 (J) S = 87.21 (J/K) V = 15.14 (cc) Cp = 47.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.55 | 27.01 | 6.44 |

quartz mass = 13.59 (gm) density = 2.56 (gm/cc)
SiO2
G = -222241.28 (J) H = -190199.98 (J) S = 28.28 (J/K) V = 5.32 (cc) Cp = 15.94 (J/K)

rhm-oxide mass = 0.84 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.10Fe'"0.16Al0.11Ti0.87O3
G = -8237.98 (J) H = -6463.09 (J) S = 1.57 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.28 | 7.79 | 72.19 | 4.35 | 5.39 |

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -958.63 (J) H = -803.14 (J) S = 0.14 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

Total solids mass = 74.36 (gm) density = 2.82 (gm/cc)
G = -1151137.19 (J) H = -972129.79 (J) S = 157.97 (J/K) V = 26.37 (cc) Cp = 87.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1564307.46 (J) H = -1310985.56 (J) S = 223.56 (J/K) V = 37.03 (cc) Cp = 121.81 (J/K)

Oxygen delta moles = -0.00196637 delta grams = -0.0629215
G = 498.65 (J) H = -53.83 (J) S = -0.49 (J/K) V = -185.26 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 850.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.05 COH = 1.30 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 24.31 (gm) density = 2.39 (gm/cc) viscosity = 5.72 (log 10 poise) (analysis in wt %)
G = -392406.22 (J) H = -322356.30 (J) S = 62.37 (J/K) V = 10.16 (cc) Cp = 32.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.57 | 0.52 | 13.54 | 0.25 | 0.00 | 0.88 | 0.38 | 0.19 | 0.00 | 0.00 | 2.28 | 2.79 | 4.91 | 0.54 | 4.15 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.44 (gm) density = 3.93 (gm/cc) (analysis in mole %)

(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -46521.08 (J) H = -38987.92 (J) S = 6.71 (J/K) V = 0.87 (cc) Cp = 3.72 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.21 | 17.79 | 24.00 |

orthopyroxene mass = 10.91 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.92Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -142628.51 (J) H = -117916.44 (J) S = 22.00 (J/K) V = 3.07 (cc) Cp = 12.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.28 | 96.14 | 97.32 | 4.79 | -4.57 | 6.27 | 0.33 |

clinopyroxene mass = 6.60 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.38Mg0.55Fe'"0.06Ti0.05Al0.24Si1.84O6
G = -95592.11 (J) H = -80702.97 (J) S = 13.26 (J/K) V = 1.94 (cc) Cp = 7.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.49 | 11.47 | 38.01 | 10.22 | -0.89 | 6.39 | 7.31 |

feldspar mass = 39.50 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.67Ca0.26Al1.26Si2.74O8
G = -642655.60 (J) H = -545471.75 (J) S = 86.53 (J/K) V = 15.09 (cc) Cp = 47.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.26 | 25.79 | 6.95 |

quartz mass = 14.25 (gm) density = 2.56 (gm/cc)
SiO2
G = -232729.12 (J) H = -199595.88 (J) S = 29.50 (J/K) V = 5.57 (cc) Cp = 16.69 (J/K)

rhm-oxide mass = 0.85 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.10Fe'"0.15Al0.11Ti0.87O3
G = -8423.37 (J) H = -6631.53 (J) S = 1.60 (J/K) V = 0.18 (cc) Cp = 0.80 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.48 | 7.51 | 72.22 | 4.53 | 5.26 |

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1084.31 (J) H = -910.58 (J) S = 0.15 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 75.63 (gm) density = 2.83 (gm/cc)
G = -1169634.10 (J) H = -990217.08 (J) S = 159.74 (J/K) V = 26.76 (cc) Cp = 88.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1562040.32 (J) H = -1312573.38 (J) S = 222.11 (J/K) V = 36.92 (cc) Cp = 121.47 (J/K)

Oxygen delta moles = -0.00203988 delta grams = -0.0652738
G = 512.24 (J) H = -55.12 (J) S = -0.51 (J/K) V = -190.49 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 840.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.06 COH = 1.27
IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 23.08 (gm) density = 2.39 (gm/cc) viscosity = 5.66 (log 10 poise) (analysis in wt %)
G = -372471.21 (J) H = -306465.96 (J) S = 59.30 (J/K) V = 9.67 (cc) Cp = 31.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.44 | 0.49 | 13.49 | 0.23 | 0.00 | 0.80 | 0.40 | 0.18 | 0.00 | 0.00 | 2.21 | 2.83 | 5.01 | 0.55 | 4.37 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.86 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -65780.23 (J) H = -55263.51 (J) S = 9.45 (J/K) V = 1.24 (cc) Cp = 5.26 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.06 | 17.72 | 24.22 |

orthopyroxene mass = 9.89 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.94Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -129572.79 (J) H = -107460.96 (J) S = 19.86 (J/K) V = 2.79 (cc) Cp = 11.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.75 | 96.22 | 95.99 | 4.66 | -4.45 | 6.01 | 0.33 |

clinopyroxene mass = 6.87 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.82Fe"0.37Mg0.56Fe'"0.05Ti0.05Al0.24Si1.85O6
G = -99731.86 (J) H = -84444.38 (J) S = 13.73 (J/K) V = 2.03 (cc) Cp = 7.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.61 | 10.95 | 36.62 | 10.18 | -0.78 | 5.97 | 7.46 |

feldspar mass = 39.39 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -639805.91 (J) H = -544170.41 (J) S = 85.91 (J/K) V = 15.06 (cc) Cp = 47.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.90 | 24.61 | 7.49 |

quartz mass = 14.88 (gm) density = 2.56 (gm/cc)
SiO2
G = -242664.30 (J) H = -208554.29 (J) S = 30.64 (J/K) V = 5.82 (cc) Cp = 17.41 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.14Al0.10Ti0.88O3
G = -8579.62 (J) H = -6777.90 (J) S = 1.62 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.68 | 7.24 | 72.24 | 4.70 | 5.13 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1184.83 (J) H = -997.32 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 76.85 (gm) density = 2.83 (gm/cc)
G = -1187319.54 (J) H = -1007668.78 (J) S = 161.39 (J/K) V = 27.15 (cc) Cp = 90.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1559790.75 (J) H = -1314134.74 (J) S = 220.69 (J/K) V = 36.81 (cc) Cp = 121.14 (J/K)

Oxygen delta moles = -0.00210737 delta grams = -0.0674333
G = 523.97 (J) H = -56.20 (J) S = -0.52 (J/K) V = -195.04 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 21.90 (gm) density = 2.38 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -353194.66 (J) H = -291046.94 (J) S = 56.34 (J/K) V = 9.19 (cc) Cp = 29.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.29 | 0.45 | 13.44 | 0.21 | 0.00 | 0.72 | 0.41 | 0.18 | 0.00 | 0.00 | 2.16 | 2.87 | 5.10 | 0.57 | 4.60 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.20 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -83813.42 (J) H = -70585.60 (J) S = 11.99 (J/K) V = 1.58 (cc) Cp = 6.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.91 | 17.64 | 24.45 |

orthopyroxene mass = 8.93 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.95Mg0.95Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -117255.41 (J) H = -97550.82 (J) S = 17.86 (J/K) V = 2.52 (cc) Cp = 10.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.20 | 96.29 | 94.63 | 4.52 | -4.32 | 5.75 | 0.33 |

clinopyroxene mass = 7.13 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.35Mg0.57Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -103692.04 (J) H = -88051.74 (J) S = 14.18 (J/K) V = 2.11 (cc) Cp = 7.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.68 | 10.46 | 35.24 | 10.13 | -0.68 | 5.56 | 7.60 |

feldspar mass = 39.32 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.68Ca0.23Al1.23Si2.77O8
G = -637494.68 (J) H = -543320.06 (J) S = 85.37 (J/K) V = 15.04 (cc) Cp = 47.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.47 | 23.45 | 8.08 |

quartz mass = 15.48 (gm) density = 2.56 (gm/cc)
SiO2
G = -252135.97 (J) H = -217148.90 (J) S = 31.72 (J/K) V = 6.05 (cc) Cp = 18.09 (J/K)

rhm-oxide mass = 0.88 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.14Al0.10Ti0.88O3
G = -8710.17 (J) H = -6904.71 (J) S = 1.64 (J/K) V = 0.19 (cc) Cp = 0.82 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.89 | 6.98 | 72.25 | 4.86 | 5.01 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -1261.91 (J)  H = -1064.69 (J)  S = 0.18 (J/K)  V = 0.03 (cc)  Cp = 0.10 (J/K)

Total solids  mass = 78.03 (gm)  density = 2.84 (gm/cc)
G = -1204363.60 (J)  H = -1024626.52 (J)  S = 162.93 (J/K)  V = 27.52 (cc)  Cp = 91.31 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.72 (gm/cc)
G = -1557558.27 (J)  H = -1315673.46 (J)  S = 219.27 (J/K)  V = 36.71 (cc)  Cp = 120.83 (J/K)

Oxygen  delta moles = -0.00216953  delta grams = -0.0694223
G = 534.06 (J)  H = -57.09 (J)  S = -0.54 (J/K)  V = -198.99 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 820.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = -0.08  COH = 1.21
IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 20.75 (gm)  density = 2.38 (gm/cc)  viscosity = 5.52 (log 10 poise)  (analysis in wt %)
G = -334412.84 (J)  H = -275965.68 (J)  S = 53.47 (J/K)  V = 8.73 (cc)  Cp = 28.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.09 | 0.42 | 13.39 | 0.19 | 0.00 | 0.65 | 0.43 | 0.17 | 0.00 | 0.00 | 2.11 | 2.91 | 5.17 | 0.59 | 4.86 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 7.46 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.58Mg0.25)3Al2Si3O12
G = -100784.17 (J)  H = -85084.65 (J)  S = 14.36 (J/K)  V = 1.90 (cc)  Cp = 8.06 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.76 | 17.55 | 24.69 |

orthopyroxene  mass = 8.03 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.97Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -105573.21 (J)  H = -88106.04 (J)  S = 15.98 (J/K)  V = 2.27 (cc)  Cp = 9.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.64 | 96.36 | 93.25 | 4.39 | -4.20 | 5.50 | 0.33 |

clinopyroxene  mass = 7.37 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.34Mg0.58Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -107504.35 (J)  H = -91550.56 (J)  S = 14.59 (J/K)  V = 2.18 (cc)  Cp = 8.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.71 | 9.99 | 33.87 | 10.09 | -0.57 | 5.17 | 7.74 |

feldspar  mass = 39.27 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -635704.57 (J)  H = -542908.41 (J)  S = 84.89 (J/K)  V = 15.04 (cc)  Cp = 47.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.96 | 22.31 | 8.72 |

quartz  mass = 16.06 (gm)  density = 2.56 (gm/cc)

SiO2
G = -261228.91 (J)  H = -225450.30 (J)  S = 32.73 (J/K)  V = 6.28 (cc)  Cp = 18.75 (J/K)

rhm-oxide  mass = 0.90 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.13Al0.10Ti0.88O3
G = -8817.70 (J)  H = -7013.88 (J)  S = 1.65 (J/K)  V = 0.19 (cc)  Cp = 0.83 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.10 | 6.73 | 72.25 | 5.02 | 4.90 |

apatite  mass = 0.09 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1316.70 (J)  H = -1113.50 (J)  S = 0.19 (J/K)  V = 0.03 (cc)  Cp = 0.10 (J/K)

Total solids  mass = 79.18 (gm)  density = 2.84 (gm/cc)
G = -1220929.60 (J)  H = -1041227.34 (J)  S = 164.39 (J/K)  V = 27.89 (cc)  Cp = 92.55 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.73 (gm/cc)
G = -1555342.45 (J)  H = -1317193.02 (J)  S = 217.86 (J/K)  V = 36.61 (cc)  Cp = 120.55 (J/K)

Oxygen  delta moles = -0.00222698  delta grams = -0.0712606
G = 542.71 (J)  H = -57.82 (J)  S = -0.55 (J/K)  V = -202.40 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 810.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.66  delta HM = -5.12  NNO = 0.00  QFM = -0.09  COH = 1.18
IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid  mass = 19.61 (gm)  density = 2.37 (gm/cc)  viscosity = 5.42 (log 10 poise)  (analysis in wt %)
G = -315918.13 (J)  H = -261047.08 (J)  S = 50.66 (J/K)  V = 8.27 (cc)  Cp = 26.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.85 | 0.39 | 13.34 | 0.18 | 0.00 | 0.59 | 0.45 | 0.17 | 0.00 | 0.00 | 2.07 | 2.97 | 5.22 | 0.62 | 5.14 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 8.62 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -116278.98 (J)  H = -98402.87 (J)  S = 16.50 (J/K)  V = 2.19 (cc)  Cp = 9.29 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.63 | 17.46 | 24.90 |

orthopyroxene  mass = 7.24 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.92Mg0.99Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -95363.00 (J)  H = -79829.11 (J)  S = 14.34 (J/K)  V = 2.05 (cc)  Cp = 8.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.18 | 96.44 | 91.95 | 4.26 | -4.08 | 5.26 | 0.34 |

clinopyroxene  mass = 7.48 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.33Mg0.60Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -109265.74 (J)  H = -93311.95 (J)  S = 14.73 (J/K)  V = 2.21 (cc)  Cp = 8.32 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
35.62 9.55 32.59 10.03 -0.47 4.79 7.89

clinopyroxene mass = 0.15 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.26Mg0.34Fe'"0.05Ti0.39Al0.73Si1.26O6
G = -2128.97 (J) H = -1825.25 (J) S = 0.28 (J/K) V = 0.04 (cc) Cp = 0.16 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-9.40 2.04 26.24 69.45 8.28 -3.71 7.10

feldspar mass = 39.25 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.21Al1.21Si2.79O8
G = -634143.00 (J) H = -542685.76 (J) S = 84.44 (J/K) V = 15.04 (cc) Cp = 47.47 (J/K)
albite anorthite sanidine
69.40 21.17 9.43

quartz mass = 16.63 (gm) density = 2.56 (gm/cc)
SiO2
G = -270130.48 (J) H = -233618.41 (J) S = 33.71 (J/K) V = 6.50 (cc) Cp = 19.39 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.13Al0.10Ti0.89O3
G = -8562.85 (J) H = -6834.13 (J) S = 1.60 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.30 6.49 72.23 5.20 4.79

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1349.61 (J) H = -1143.98 (J) S = 0.19 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 80.32 (gm) density = 2.84 (gm/cc)
G = -1237222.63 (J) H = -1057651.46 (J) S = 165.79 (J/K) V = 28.25 (cc) Cp = 93.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.74 (gm/cc)
G = -1553140.76 (J) H = -1318698.54 (J) S = 216.44 (J/K) V = 36.52 (cc) Cp = 120.28 (J/K)

Oxygen delta moles = -0.00228443 delta grams = -0.073099
G = 551.08 (J) H = -58.51 (J) S = -0.56 (J/K) V = -205.73 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14
IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 18.45 (gm) density = 2.37 (gm/cc) viscosity = 5.29 (log 10 poise) (analysis in wt %)
G = -297056.99 (J) H = -245715.33 (J) S = 47.84 (J/K) V = 7.80 (cc) Cp = 24.98 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O
CO2 SO3 Cl2O-1 F2O-1
68.56 0.35 13.20 0.17 0.00 0.55 0.52 0.16 0.00 0.00 2.05 3.07 5.23 0.66 5.46 0.00 0.00 0.00
0.00

garnet mass = 9.35 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -125853.97 (J) H = -106749.31 (J) S = 17.80 (J/K) V = 2.37 (cc) Cp = 10.07 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.81 | 17.41 | 24.78 |

orthopyroxene mass = 7.14 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.92Mg0.99Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -93962.10 (J) H = -78866.77 (J) S = 14.07 (J/K) V = 2.02 (cc) Cp = 8.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.81 | 96.55 | 91.68 | 4.14 | -3.96 | 5.07 | 0.34 |

clinopyroxene mass = 6.42 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.32Mg0.60Fe'"0.04Ti0.05Al0.22Si1.86O6
G = -93867.84 (J) H = -80366.53 (J) S = 12.58 (J/K) V = 1.90 (cc) Cp = 7.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.92 | 9.23 | 31.91 | 9.72 | -0.35 | 4.49 | 8.07 |

clinopyroxene mass = 1.59 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.26Mg0.34Fe'"0.04Ti0.39Al0.73Si1.26O6
G = -23145.58 (J) H = -19890.70 (J) S = 3.03 (J/K) V = 0.45 (cc) Cp = 1.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.41 | 1.93 | 25.96 | 69.85 | 8.44 | -4.08 | 7.31 |

feldspar mass = 39.11 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -630670.94 (J) H = -540804.69 (J) S = 83.74 (J/K) V = 15.00 (cc) Cp = 47.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.87 | 19.81 | 10.32 |

quartz mass = 17.24 (gm) density = 2.56 (gm/cc)
SiO2
G = -279783.20 (J) H = -242468.93 (J) S = 34.77 (J/K) V = 6.74 (cc) Cp = 20.09 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.72Mg0.11Fe'"0.13Al0.09Ti0.89O3
G = -5236.32 (J) H = -4191.88 (J) S = 0.97 (J/K) V = 0.12 (cc) Cp = 0.49 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.31 | 6.36 | 72.03 | 5.64 | 4.65 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1358.72 (J) H = -1154.37 (J) S = 0.19 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 81.47 (gm) density = 2.85 (gm/cc)
G = -1253878.67 (J) H = -1074493.18 (J) S = 167.16 (J/K) V = 28.63 (cc) Cp = 95.07 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.74 (gm/cc)
G = -1550935.66 (J) H = -1320208.51 (J) S = 215.00 (J/K) V = 36.43 (cc) Cp = 120.05 (J/K)

Oxygen delta moles = -0.00237574 delta grams = -0.0760209

G = 567.26 (J)  H = -60.01 (J)  S = -0.58 (J/K)  V = -211.98 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 790.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.09  delta HM = -5.14  NNO = 0.00  QFM = -0.11  COH = 1.11  IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid  mass = 16.84 (gm)  density = 2.36 (gm/cc)  viscosity = 5.03 (log 10 poise)  (analysis in wt %)
G = -271179.47 (J)  H = -224326.89 (J)  S = 44.07 (J/K)  V = 7.15 (cc)  Cp = 22.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.15 | 0.30 | 12.95 | 0.17 | 0.00 | 0.53 | 0.63 | 0.16 | 0.00 | 0.00 | 2.07 | 3.34 | 4.99 | 0.71 | 5.99 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.03 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -134811.83 (J)  H = -114608.28 (J)  S = 19.00 (J/K)  V = 2.55 (cc)  Cp = 10.79 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.98 | 17.34 | 24.68 |

orthopyroxene  mass = 7.10 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg1.00Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -93471.98 (J)  H = -78665.63 (J)  S = 13.93 (J/K)  V = 2.01 (cc)  Cp = 8.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.39 | 96.65 | 91.36 | 4.01 | -3.85 | 4.89 | 0.34 |

clinopyroxene  mass = 5.26 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.31Mg0.61Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -76869.62 (J)  H = -65980.20 (J)  S = 10.24 (J/K)  V = 1.56 (cc)  Cp = 5.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.20 | 8.91 | 31.21 | 9.42 | -0.22 | 4.19 | 8.29 |

clinopyroxene  mass = 3.12 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.26Mg0.34Fe'"0.04Ti0.39Al0.73Si1.26O6
G = -45344.93 (J)  H = -39060.27 (J)  S = 5.91 (J/K)  V = 0.88 (cc)  Cp = 3.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.41 | 1.83 | 25.65 | 70.22 | 8.61 | -4.46 | 7.55 |

feldspar  mass = 38.00 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -612102.74 (J)  H = -525999.11 (J)  S = 80.99 (J/K)  V = 14.58 (cc)  Cp = 46.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.81 | 18.96 | 10.23 |

feldspar  mass = 1.30 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -20241.21 (J)  H = -17358.74 (J)  S = 2.71 (J/K)  V = 0.51 (cc)  Cp = 1.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.45 | 1.84 | 66.72 |

quartz  mass = 17.99 (gm)  density = 2.56 (gm/cc)

SiO2
G = -291593.84 (J)  H = -253227.48 (J)  S = 36.09 (J/K)  V = 7.04 (cc)  Cp = 20.94 (J/K)

rhm-oxide  mass = 0.18 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.06Fe"0.72Mg0.11Fe'"0.12Al0.09Ti0.89O3
G = -1717.75 (J)  H = -1379.31 (J)  S = 0.32 (J/K)  V = 0.04 (cc)  Cp = 0.16 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.33 | 6.24 | 71.78 | 6.13 | 4.52 |

apatite  mass = 0.10 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1411.47 (J)  H = -1201.95 (J)  S = 0.20 (J/K)  V = 0.03 (cc)  Cp = 0.11 (J/K)

Total solids  mass = 83.08 (gm)  density = 2.85 (gm/cc)
G = -1277565.37 (J)  H = -1097480.98 (J)  S = 169.39 (J/K)  V = 29.19 (cc)  Cp = 96.89 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.75 (gm/cc)
G = -1548744.85 (J)  H = -1321807.86 (J)  S = 213.46 (J/K)  V = 36.34 (cc)  Cp = 119.78 (J/K)

Oxygen  delta moles = -0.00246839  delta grams = -0.0789855
G = 583.31 (J)  H = -61.48 (J)  S = -0.61 (J/K)  V = -218.19 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 780.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = -0.12  COH = 1.07
IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 15.29 (gm)  density = 2.34 (gm/cc)  viscosity = 4.75 (log 10 poise)  (analysis in wt %)
G = -246300.28 (J)  H = -203704.89 (J)  S = 40.45 (J/K)  V = 6.52 (cc)  Cp = 20.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.59 | 0.26 | 12.74 | 0.17 | 0.00 | 0.52 | 0.73 | 0.16 | 0.00 | 0.00 | 2.11 | 3.62 | 4.74 | 0.78 | 6.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.85 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -145606.48 (J)  H = -124074.84 (J)  S = 20.44 (J/K)  V = 2.75 (cc)  Cp = 11.66 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.99 | 17.25 | 24.75 |

orthopyroxene  mass = 6.74 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg1.01Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -88762.52 (J)  H = -74915.90 (J)  S = 13.15 (J/K)  V = 1.91 (cc)  Cp = 7.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.39 | 96.74 | 90.47 | 3.89 | -3.74 | 4.69 | 0.34 |

clinopyroxene  mass = 4.77 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.30Mg0.62Fe'"0.04Ti0.04Al0.22Si1.87O6
G = -69852.60 (J)  H = -60115.30 (J)  S = 9.25 (J/K)  V = 1.42 (cc)  Cp = 5.30 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
39.83 8.60 30.21 9.14 -0.16 3.91 8.48

clinopyroxene mass = 3.88 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.25Mg0.34Fe'"0.04Ti0.40Al0.74Si1.25O6
G = -56329.93 (J) H = -48640.67 (J) S = 7.30 (J/K) V = 1.09 (cc) Cp = 4.19 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-9.26 1.74 25.15 70.72 8.74 -4.83 7.75

feldspar mass = 37.04 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.72Ca0.18Al1.18Si2.82O8
G = -595825.70 (J) H = -513111.81 (J) S = 78.54 (J/K) V = 14.21 (cc) Cp = 45.00 (J/K)
albite anorthite sanidine
71.68 18.29 10.03

feldspar mass = 2.55 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -39826.44 (J) H = -34230.86 (J) S = 5.31 (J/K) V = 1.00 (cc) Cp = 3.02 (J/K)
albite anorthite sanidine
31.19 1.69 67.12

quartz mass = 18.70 (gm) density = 2.56 (gm/cc)
SiO2
G = -302653.56 (J) H = -263374.26 (J) S = 37.30 (J/K) V = 7.31 (cc) Cp = 21.73 (J/K)

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1426.08 (J) H = -1217.19 (J) S = 0.20 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

Total solids mass = 84.63 (gm) density = 2.85 (gm/cc)
G = -1300283.32 (J) H = -1119680.81 (J) S = 171.49 (J/K) V = 29.73 (cc) Cp = 98.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.76 (gm/cc)
G = -1546583.60 (J) H = -1323385.70 (J) S = 211.93 (J/K) V = 36.25 (cc) Cp = 119.55 (J/K)

Oxygen delta moles = -0.00253406 delta grams = -0.0810868
G = 592.61 (J) H = -62.23 (J) S = -0.62 (J/K) V = -221.89 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 770.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.14 COH = 1.04 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 12.78 (gm) density = 2.33 (gm/cc) viscosity = 4.35 (log 10 poise) (analysis in wt %)
G = -205848.03 (J) H = -170024.13 (J) S = 34.34 (J/K) V = 5.49 (cc) Cp = 17.55 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.91 0.22 12.17 0.19 0.00 0.55 0.87 0.14 0.00 0.00 2.17 4.17 4.35 0.88 7.38 0.00 0.00 0.00 0.00

garnet mass = 13.02 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -173754.94 (J) H = -148334.09 (J) S = 24.37 (J/K) V = 3.30 (cc) Cp = 13.94 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.27 | 17.27 | 23.46 |

orthopyroxene mass = 4.02 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -52495.62 (J) H = -44368.42 (J) S = 7.79 (J/K) V = 1.14 (cc) Cp = 4.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.88 | 96.96 | 93.82 | 3.80 | -3.66 | 4.63 | 0.34 |

clinopyroxene mass = 5.00 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.31Mg0.60Fe'"0.04Ti0.05Al0.21Si1.87O6
G = -72845.24 (J) H = -62799.75 (J) S = 9.63 (J/K) V = 1.48 (cc) Cp = 5.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.64 | 8.37 | 31.43 | 8.71 | 0.35 | 3.57 | 8.93 |

clinopyroxene mass = 3.95 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.26Mg0.33Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -57117.22 (J) H = -49408.84 (J) S = 7.39 (J/K) V = 1.11 (cc) Cp = 4.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.16 | 1.65 | 26.16 | 70.15 | 9.29 | -5.32 | 8.23 |

biotite mass = 1.50 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -23629.16 (J) H = -20248.97 (J) S = 3.24 (J/K) V = 0.54 (cc) Cp = 1.88 (J/K)

| annite | phlogopite |
|---|---|
| 4.24 | 95.76 |

feldspar mass = 36.45 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -585494.82 (J) H = -505255.79 (J) S = 76.92 (J/K) V = 14.00 (cc) Cp = 44.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.03 | 16.87 | 10.10 |

feldspar mass = 2.62 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -40803.87 (J) H = -35148.07 (J) S = 5.42 (J/K) V = 1.03 (cc) Cp = 3.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.49 | 1.53 | 66.98 |

quartz mass = 20.46 (gm) density = 2.56 (gm/cc)
SiO2
G = -330785.40 (J) H = -288446.91 (J) S = 40.59 (J/K) V = 8.00 (cc) Cp = 23.75 (J/K)

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1694.33 (J) H = -1449.45 (J) S = 0.23 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 87.14 (gm) density = 2.85 (gm/cc)
G = -1338620.60 (J) H = -1155460.30 (J) S = 175.58 (J/K) V = 30.62 (cc) Cp = 101.59 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.77 (gm/cc)
G = -1544468.63 (J) H = -1325484.43 (J) S = 209.93 (J/K) V = 36.11 (cc) Cp = 119.14 (J/K)

Oxygen delta moles = -0.00254369 delta grams = -0.0813951
G = 588.62 (J) H = -61.58 (J) S = -0.62 (J/K) V = -220.62 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.39 (gm) density = 2.31 (gm/cc) viscosity = 3.97 (log 10 poise) (analysis in wt %)
G = -167590.87 (J) H = -138218.65 (J) S = 28.43 (J/K) V = 4.50 (cc) Cp = 14.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.07 | 0.17 | 11.74 | 0.20 | 0.00 | 0.57 | 0.86 | 0.12 | 0.00 | 0.00 | 2.28 | 4.67 | 4.01 | 0.98 | 8.32 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.66 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -207800.72 (J) H = -177752.34 (J) S = 29.08 (J/K) V = 3.96 (cc) Cp = 16.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.30 | 17.80 | 21.90 |

clinopyroxene mass = 7.54 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.33Mg0.58Fe'"0.04Ti0.05Al0.21Si1.87O6
G = -109437.94 (J) H = -94518.63 (J) S = 14.44 (J/K) V = 2.23 (cc) Cp = 8.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.83 | 7.83 | 32.53 | 8.46 | 0.60 | 3.47 | 9.28 |

clinopyroxene mass = 1.05 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.27Mg0.32Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -15168.01 (J) H = -13145.19 (J) S = 1.96 (J/K) V = 0.29 (cc) Cp = 1.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.19 | 1.51 | 27.22 | 70.00 | 9.54 | -5.55 | 8.46 |

biotite mass = 3.35 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -52714.29 (J) H = -45260.82 (J) S = 7.21 (J/K) V = 1.21 (cc) Cp = 4.21 (J/K)

| annite | phlogopite |
|---|---|
| 4.98 | 95.02 |

feldspar mass = 36.80 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -590408.33 (J) H = -510597.13 (J) S = 77.25 (J/K) V = 14.13 (cc) Cp = 45.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.82 | 16.33 | 9.85 |

feldspar mass = 2.10 (gm) density = 2.54 (gm/cc) (analysis in mole %)

K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -32682.97 (J) H = -28215.26 (J) S = 4.32 (J/K) V = 0.83 (cc) Cp = 2.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.09 | 1.39 | 67.52 |

quartz mass = 22.14 (gm) density = 2.56 (gm/cc)
SiO2
G = -357402.85 (J) H = -312296.07 (J) S = 43.66 (J/K) V = 8.66 (cc) Cp = 25.66 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.74Mg0.10Fe'"0.12Al0.08Ti0.90O3
G = -7207.14 (J) H = -5831.17 (J) S = 1.33 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.94 | 6.17 | 73.93 | 6.02 | 3.94 |

apatite mass = 0.14 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2023.08 (J) H = -1734.65 (J) S = 0.28 (J/K) V = 0.05 (cc) Cp = 0.16 (J/K)

Total solids mass = 89.53 (gm) density = 2.84 (gm/cc)
G = -1374845.35 (J) H = -1189351.25 (J) S = 179.54 (J/K) V = 31.51 (cc) Cp = 104.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.78 (gm/cc)
G = -1542436.22 (J) H = -1327569.90 (J) S = 207.97 (J/K) V = 36.00 (cc) Cp = 118.79 (J/K)

Oxygen delta moles = -0.0024392 delta grams = -0.0780516
G = 558.47 (J) H = -58.19 (J) S = -0.60 (J/K) V = -209.53 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 750.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.16 COH = 0.97 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 8.76 (gm) density = 2.29 (gm/cc) viscosity = 3.42 (log 10 poise) (analysis in wt %)
G = -141280.12 (J) H = -116154.23 (J) S = 24.56 (J/K) V = 3.82 (cc) Cp = 12.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.46 | 0.13 | 11.21 | 0.22 | 0.00 | 0.61 | 1.15 | 0.11 | 0.00 | 0.00 | 2.49 | 5.30 | 3.55 | 1.18 | 9.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.88 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -209643.96 (J) H = -179687.93 (J) S = 29.28 (J/K) V = 4.00 (cc) Cp = 16.87 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.29 | 18.20 | 20.51 |

clinopyroxene mass = 6.09 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.83Fe"0.34Mg0.56Fe'"0.04Ti0.05Al0.21Si1.88O6
G = -87913.78 (J) H = -76065.85 (J) S = 11.58 (J/K) V = 1.80 (cc) Cp = 6.70 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
36.89 7.41 33.66 8.15 0.91 3.32 9.66

clinopyroxene mass = 2.70 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.28Mg0.30Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -38774.56 (J) H = -33665.68 (J) S = 4.99 (J/K) V = 0.75 (cc) Cp = 2.90 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-12.18 1.40 28.23 69.77 9.86 -5.84 8.75

biotite mass = 3.93 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -61613.60 (J) H = -53002.33 (J) S = 8.42 (J/K) V = 1.41 (cc) Cp = 4.93 (J/K)
annite phlogopite
5.79 94.21

feldspar mass = 36.35 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.75Ca0.16Al1.16Si2.84O8
G = -582421.71 (J) H = -504770.33 (J) S = 75.89 (J/K) V = 13.96 (cc) Cp = 44.77 (J/K)
albite anorthite sanidine
74.71 15.62 9.66

feldspar mass = 2.61 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -40585.65 (J) H = -35115.11 (J) S = 5.35 (J/K) V = 1.03 (cc) Cp = 3.10 (J/K)
albite anorthite sanidine
30.78 1.26 67.96

quartz mass = 23.12 (gm) density = 2.56 (gm/cc)
SiO2
G = -372769.40 (J) H = -326388.31 (J) S = 45.33 (J/K) V = 9.04 (cc) Cp = 26.76 (J/K)

rhm-oxide mass = 0.35 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.74Mg0.09Fe'"0.12Al0.08Ti0.90O3
G = -3341.63 (J) H = -2709.87 (J) S = 0.62 (J/K) V = 0.07 (cc) Cp = 0.32 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.29 6.23 74.27 6.45 3.76

apatite mass = 0.14 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1983.13 (J) H = -1704.27 (J) S = 0.27 (J/K) V = 0.04 (cc) Cp = 0.15 (J/K)

Total solids mass = 91.16 (gm) density = 2.84 (gm/cc)
G = -1399047.42 (J) H = -1213109.68 (J) S = 181.73 (J/K) V = 32.11 (cc) Cp = 106.50 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.78 (gm/cc)
G = -1540327.54 (J) H = -1329263.91 (J) S = 206.29 (J/K) V = 35.93 (cc) Cp = 118.76 (J/K)

Oxygen delta moles = -0.00251095 delta grams = -0.0803473
G = 568.76 (J) H = -59.03 (J) S = -0.61 (J/K) V = -213.60 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 740.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = -0.17  COH = 0.93
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 7.15 (gm)  density = 2.26 (gm/cc)  viscosity = 2.71 (log 10 poise)  (analysis in wt %)
G = -115408.78 (J)  H = -94374.06 (J)  S = 20.76 (J/K)  V = 3.16 (cc)  Cp = 10.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.84 | 0.10 | 10.59 | 0.25 | 0.00 | 0.66 | 1.55 | 0.10 | 0.00 | 0.00 | 2.87 | 6.08 | 2.99 | 1.52 | 11.45 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 16.05 (gm)  density = 3.98 (gm/cc)  (analysis in mole %)
(Ca0.19Fe"0.62Mg0.19)3Al2Si3O12
G = -210857.86 (J)  H = -181098.57 (J)  S = 29.37 (J/K)  V = 4.04 (cc)  Cp = 17.00 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.16 | 18.55 | 19.29 |

clinopyroxene  mass = 4.85 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.83Fe"0.35Mg0.55Fe'"0.04Ti0.05Al0.21Si1.88O6
G = -69728.81 (J)  H = -60443.71 (J)  S = 9.16 (J/K)  V = 1.43 (cc)  Cp = 5.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.09 | 7.03 | 34.68 | 7.84 | 1.20 | 3.15 | 10.01 |

clinopyroxene  mass = 4.13 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.29Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -59069.00 (J)  H = -51383.46 (J)  S = 7.59 (J/K)  V = 1.15 (cc)  Cp = 4.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.09 | 1.29 | 29.13 | 69.62 | 10.16 | -6.15 | 9.04 |

biotite  mass = 4.45 (gm)  density = 2.79 (gm/cc)  (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -69358.60 (J)  H = -59778.08 (J)  S = 9.46 (J/K)  V = 1.60 (cc)  Cp = 5.56 (J/K)

| annite | phlogopite |
|---|---|
| 6.62 | 93.38 |

feldspar  mass = 36.04 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -576661.55 (J)  H = -500853.93 (J)  S = 74.82 (J/K)  V = 13.84 (cc)  Cp = 44.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.57 | 14.98 | 9.45 |

feldspar  mass = 3.10 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -48048.13 (J)  H = -41663.55 (J)  S = 6.30 (J/K)  V = 1.22 (cc)  Cp = 3.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.41 | 1.14 | 68.45 |

quartz  mass = 24.05 (gm)  density = 2.59 (gm/cc)
SiO2
G = -387310.58 (J)  H = -340369.66 (J)  S = 46.33 (J/K)  V = 9.28 (cc)  Cp = 32.42 (J/K)

apatite  mass = 0.12 (gm)  density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -1789.52 (J)  H = -1541.37 (J)  S = 0.24 (J/K)  V = 0.04 (cc)  Cp = 0.14 (J/K)

Total solids  mass = 92.77 (gm)  density = 2.85 (gm/cc)
G = -1422824.06 (J)  H = -1237132.32 (J)  S = 183.28 (J/K)  V = 32.59 (cc)  Cp = 113.29 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.80 (gm/cc)
G = -1538232.84 (J)  H = -1331506.38 (J)  S = 204.04 (J/K)  V = 35.74 (cc)  Cp = 123.47 (J/K)

Oxygen  delta moles = -0.00258004  delta grams = -0.082558
G = 578.10 (J)  H = -59.75 (J)  S = -0.63 (J/K)  V = -217.33 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 730.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.18  COH = 0.89
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 5.44 (gm)  density = 2.21 (gm/cc)  viscosity = 1.71 (log 10 poise)  (analysis in wt %)
G = -88245.04 (J)  H = -71416.83 (J)  S = 16.78 (J/K)  V = 2.46 (cc)  Cp = 8.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.71 | 0.06 | 9.96 | 0.28 | 0.00 | 0.70 | 2.04 | 0.08 | 0.00 | 0.00 | 3.72 | 7.10 | 2.31 | 2.27 | 14.78 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 16.07 (gm)  density = 3.98 (gm/cc)  (analysis in mole %)
(Ca0.19Fe"0.62Mg0.18)3Al2Si3O12
G = -210669.55 (J)  H = -181358.92 (J)  S = 29.22 (J/K)  V = 4.04 (cc)  Cp = 16.98 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.37 | 19.40 | 18.23 |

clinopyroxene  mass = 4.53 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.83Fe"0.35Mg0.54Fe'"0.04Ti0.04Al0.21Si1.88O6
G = -65104.04 (J)  H = -56560.21 (J)  S = 8.52 (J/K)  V = 1.33 (cc)  Cp = 4.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.55 | 6.42 | 34.78 | 7.71 | 1.08 | 3.24 | 10.22 |

clinopyroxene  mass = 4.18 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.30Mg0.29Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -59759.39 (J)  H = -52094.99 (J)  S = 7.64 (J/K)  V = 1.17 (cc)  Cp = 4.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.81 | 1.15 | 29.57 | 70.21 | 10.05 | -6.17 | 9.01 |

biotite  mass = 4.80 (gm)  density = 2.79 (gm/cc)  (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -74615.35 (J)  H = -64442.40 (J)  S = 10.14 (J/K)  V = 1.72 (cc)  Cp = 5.98 (J/K)

| annite | phlogopite |
|---|---|
| 7.07 | 92.93 |

feldspar  mass = 36.25 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -579564.70 (J) H = -504501.43 (J) S = 74.83 (J/K) V = 13.92 (cc) Cp = 45.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.91 | 15.13 | 8.96 |

feldspar mass = 3.70 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -57198.69 (J) H = -49708.66 (J) S = 7.47 (J/K) V = 1.45 (cc) Cp = 4.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.42 | 1.05 | 69.53 |

quartz mass = 24.85 (gm) density = 2.60 (gm/cc)
SiO2
G = -399733.45 (J) H = -352039.70 (J) S = 47.54 (J/K) V = 9.57 (cc) Cp = 33.21 (J/K)

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1296.17 (J) H = -1118.95 (J) S = 0.18 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 94.47 (gm) density = 2.84 (gm/cc)
G = -1447941.34 (J) H = -1261825.26 (J) S = 185.53 (J/K) V = 33.23 (cc) Cp = 115.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.80 (gm/cc)
G = -1536186.38 (J) H = -1333242.09 (J) S = 202.31 (J/K) V = 35.69 (cc) Cp = 123.65 (J/K)

Oxygen delta moles = -0.00260821 delta grams = -0.0834594
G = 578.06 (J) H = -59.49 (J) S = -0.64 (J/K) V = -217.54 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 720.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = -0.20 COH = 0.85 IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 4.23 (gm) density = 2.16 (gm/cc) viscosity = 0.76 (log 10 poise) (analysis in wt %)
G = -68789.99 (J) H = -55028.64 (J) S = 13.86 (J/K) V = 1.96 (cc) Cp = 6.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.01 | 0.03 | 9.06 | 0.30 | 0.00 | 0.71 | 2.63 | 0.06 | 0.00 | 0.00 | 5.14 | 8.07 | 1.70 | 3.52 | 18.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 16.10 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.20Fe"0.63Mg0.17)3Al2Si3O12
G = -210505.42 (J) H = -181642.11 (J) S = 29.06 (J/K) V = 4.04 (cc) Cp = 16.96 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.52 | 20.20 | 17.28 |

clinopyroxene mass = 4.29 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.84Fe"0.35Mg0.53Fe'"0.04Ti0.04Al0.21Si1.88O6
G = -61494.00 (J) H = -53542.59 (J) S = 8.01 (J/K) V = 1.26 (cc) Cp = 4.69 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
36.99 5.90 34.84 7.54 0.98 3.31 10.43

clinopyroxene mass = 4.22 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.30Mg0.28Fe'"0.04Ti0.40Al0.74Si1.25O6
G = -60104.28 (J) H = -52507.65 (J) S = 7.65 (J/K) V = 1.17 (cc) Cp = 4.50 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-14.50 1.03 29.95 70.78 9.97 -6.24 9.01

biotite mass = 5.10 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -79088.03 (J) H = -68448.83 (J) S = 10.71 (J/K) V = 1.83 (cc) Cp = 6.35 (J/K)
annite phlogopite
7.46 92.54

feldspar mass = 36.52 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -583214.58 (J) H = -508810.89 (J) S = 74.92 (J/K) V = 14.01 (cc) Cp = 46.55 (J/K)
albite anorthite sanidine
76.29 15.18 8.53

feldspar mass = 4.01 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.71Na0.29Ca0.01Al1.01Si2.99O8
G = -61986.09 (J) H = -53988.84 (J) S = 8.05 (J/K) V = 1.58 (cc) Cp = 4.80 (J/K)
albite anorthite sanidine
28.51 0.96 70.52

quartz mass = 25.43 (gm) density = 2.60 (gm/cc)
SiO2
G = -408548.43 (J) H = -360568.23 (J) S = 48.31 (J/K) V = 9.78 (cc) Cp = 33.69 (J/K)

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -427.29 (J) H = -369.70 (J) S = 0.06 (J/K) V = 0.01 (cc) Cp = 0.03 (J/K)

Total solids mass = 95.69 (gm) density = 2.84 (gm/cc)
G = -1465368.12 (J) H = -1279878.84 (J) S = 186.77 (J/K) V = 33.68 (cc) Cp = 117.57 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.80 (gm/cc)
G = -1534158.12 (J) H = -1334907.49 (J) S = 200.62 (J/K) V = 35.64 (cc) Cp = 124.05 (J/K)

Oxygen delta moles = -0.0026347 delta grams = -0.0843072
G = 577.51 (J) H = -59.18 (J) S = -0.64 (J/K) V = -217.56 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 710.00 (C) P = 7.000 (kbars) log(10) f O2 = -16.00 delta HM = -5.22 NNO = 0.00 QFM = -0.21 COH = 0.81
IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid mass = 3.63 (gm) density = 2.12 (gm/cc) viscosity = 0.23 (log 10 poise) (analysis in wt %)
G = -59253.03 (J) H = -47101.99 (J) S = 12.36 (J/K) V = 1.71 (cc) Cp = 5.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45.42 | 0.02 | 8.36 | 0.30 | 0.00 | 0.66 | 3.06 | 0.05 | 0.00 | 0.00 | 6.17 | 8.61 | 1.38 | 4.45 | 21.52 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 16.13 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.21Fe"0.63Mg0.16)3Al2Si3O12
G = -210472.63 (J) H = -182041.25 (J) S = 28.92 (J/K) V = 4.05 (cc) Cp = 16.96 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.62 | 20.96 | 16.42 |

clinopyroxene mass = 4.07 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.84Fe"0.35Mg0.52Fe'"0.04Ti0.04Al0.21Si1.88O6
G = -58271.20 (J) H = -50849.44 (J) S = 7.55 (J/K) V = 1.20 (cc) Cp = 4.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.44 | 5.45 | 34.86 | 7.35 | 0.87 | 3.37 | 10.66 |

clinopyroxene mass = 4.24 (gm) density = 3.60 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.30Mg0.27Fe'"0.04Ti0.41Al0.74Si1.25O6
G = -60269.12 (J) H = -52764.43 (J) S = 7.63 (J/K) V = 1.18 (cc) Cp = 4.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.15 | 0.92 | 30.28 | 71.34 | 9.91 | -6.32 | 9.02 |

biotite mass = 5.37 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.08Mg0.92)3AlSi3O10(OH)2
G = -83039.80 (J) H = -72021.72 (J) S = 11.21 (J/K) V = 1.92 (cc) Cp = 6.67 (J/K)

| annite | phlogopite |
|---|---|
| 7.80 | 92.20 |

feldspar mass = 36.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.77Ca0.15Al1.15Si2.85O8
G = -584828.36 (J) H = -511357.15 (J) S = 74.73 (J/K) V = 14.06 (cc) Cp = 47.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.71 | 15.16 | 8.13 |

feldspar mass = 4.09 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -63120.53 (J) H = -55098.85 (J) S = 8.16 (J/K) V = 1.61 (cc) Cp = 4.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.66 | 0.88 | 71.46 |

quartz mass = 25.73 (gm) density = 2.60 (gm/cc)
SiO2
G = -412892.07 (J) H = -365171.11 (J) S = 48.54 (J/K) V = 9.88 (cc) Cp = 33.80 (J/K)

Total solids mass = 96.28 (gm) density = 2.84 (gm/cc)
G = -1472893.72 (J) H = -1289303.95 (J) S = 186.74 (J/K) V = 33.89 (cc) Cp = 118.87 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.81 (gm/cc)
G = -1532146.75 (J) H = -1336405.94 (J) S = 199.10 (J/K) V = 35.60 (cc) Cp = 124.58 (J/K)

Oxygen delta moles = -0.00265949 delta grams = -0.0851006
G = 576.48 (J) H = -58.81 (J) S = -0.65 (J/K) V = -217.39 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 700.00 (C) P = 7.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = -0.22 COH = 0.77 IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 3.27 (gm) density = 2.10 (gm/cc) viscosity = -0.09 (log 10 poise) (analysis in wt %)
G = -53370.47 (J) H = -42273.12 (J) S = 11.40 (J/K) V = 1.56 (cc) Cp = 5.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 42.37 | 0.01 | 7.86 | 0.28 | 0.00 | 0.60 | 3.40 | 0.04 | 0.00 | 0.00 | 6.70 | 9.00 | 1.18 | 4.94 | 23.60 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 16.17 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.22Fe"0.63Mg0.16)3Al2Si3O12
G = -210687.76 (J) H = -182658.81 (J) S = 28.80 (J/K) V = 4.06 (cc) Cp = 16.97 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.66 | 21.73 | 15.60 |

clinopyroxene mass = 3.85 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.84Fe"0.35Mg0.52Fe'"0.04Ti0.04Al0.21Si1.89O6
G = -55076.28 (J) H = -48168.60 (J) S = 7.10 (J/K) V = 1.13 (cc) Cp = 4.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.90 | 5.04 | 34.84 | 7.15 | 0.76 | 3.42 | 10.90 |

clinopyroxene mass = 4.25 (gm) density = 3.60 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.31Mg0.27Fe'"0.03Ti0.41Al0.75Si1.25O6
G = -60378.77 (J) H = -52973.72 (J) S = 7.61 (J/K) V = 1.18 (cc) Cp = 4.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.78 | 0.82 | 30.58 | 71.90 | 9.86 | -6.42 | 9.04 |

biotite mass = 5.62 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.08Mg0.92)3AlSi3O10(OH)2
G = -86699.64 (J) H = -75356.97 (J) S = 11.66 (J/K) V = 2.01 (cc) Cp = 6.97 (J/K)

| annite | phlogopite |
|---|---|
| 8.09 | 91.91 |

feldspar mass = 36.72 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.77Ca0.15Al1.15Si2.85O8
G = -585116.14 (J) H = -512753.23 (J) S = 74.36 (J/K) V = 14.08 (cc) Cp = 48.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 77.13 | 15.12 | 7.75 |

feldspar mass = 4.11 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -63206.08 (J) H = -55295.72 (J) S = 8.13 (J/K) V = 1.61 (cc) Cp = 4.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.82 | 0.81 | 72.37 |

quartz mass = 25.93 (gm) density = 2.61 (gm/cc)
SiO2
G = -415615.56 (J) H = -368350.17 (J) S = 48.57 (J/K) V = 9.94 (cc) Cp = 33.79 (J/K)

Total solids mass = 96.64 (gm) density = 2.84 (gm/cc)
G = -1476780.2

**********----------**********
Title: f6i2m2

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.50 (log 10 poise)  (analysis in wt %)
G = -1673928.03 (J)  H = -1229466.31 (J)  S = 282.53 (J/K)  V = 39.57 (cc)  Cp = 144.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.65 | 14.17 | 0.94 | 0.00 | 4.95 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1673928.03 (J)  H = -1229466.31 (J)  S = 282.53 (J/K)  V = 39.57 (cc)  Cp = 144.47 (J/K)

Oxygen  delta moles = -2.08167e-17  delta grams = -6.66109e-16
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.55 (log 10 poise)  (analysis in wt %)
G = -1671108.80 (J)  H = -1230912.20 (J)  S = 281.61 (J/K)  V = 39.54 (cc)  Cp = 144.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.65 | 14.17 | 0.94 | 0.00 | 4.95 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.55 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1671108.80 (J)  H = -1230912.20 (J)  S = 281.61 (J/K)  V = 39.54 (cc)  Cp = 144.46 (J/K)

Oxygen  delta moles = 2.7015e-06  delta grams = 8.64449e-05
G = -0.98 (J)  H = 0.12 (J)  S = 0.00 (J/K)  V = 0.35 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1668299.02 (J)  H = -1232358.18 (J)  S = 280.68 (J/K)  V = 39.51 (cc)  Cp = 144.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.65 | 14.17 | 0.94 | 0.00 | 4.95 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1668299.02 (J)  H = -1232358.18 (J)  S = 280.68 (J/K)  V = 39.51 (cc)  Cp = 144.45 (J/K)

Oxygen  delta moles = 5.78878e-06  delta grams = 0.000185234
G = -2.09 (J)  H = 0.25 (J)  S = 0.00 (J/K)  V = 0.75 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.66 (log 10 poise)  (analysis in wt %)
G = -1665498.75 (J)  H = -1233804.25 (J)  S = 279.75 (J/K)  V = 39.48 (cc)  Cp = 144.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.65 | 14.17 | 0.94 | 0.00 | 4.95 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.66 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1665498.75 (J)  H = -1233804.25 (J)  S = 279.75 (J/K)  V = 39.48 (cc)  Cp = 144.44 (J/K)

Oxygen  delta moles = 9.27256e-06  delta grams = 0.000296711
G = -3.32 (J)  H = 0.39 (J)  S = 0.00 (J/K)  V = 1.19 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.71 (log 10 poise)  (analysis in wt %)
G = -1662708.06 (J)  H = -1235250.42 (J)  S = 278.81 (J/K)  V = 39.45 (cc)  Cp = 144.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.65 | 14.17 | 0.94 | 0.00 | 4.95 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1662708.06 (J)  H = -1235250.42 (J)  S = 278.81 (J/K)  V = 39.45 (cc)  Cp = 144.43 (J/K)

Oxygen  delta moles = 1.3164e-05  delta grams = 0.000421233
G = -4.67 (J)  H = 0.55 (J)  S = 0.00 (J/K)  V = 1.68 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.54 (gm/cc)  viscosity = 3.77 (log 10 poise)  (analysis in wt %)
G = -1659927.01 (J)  H = -1236696.70 (J)  S = 277.87 (J/K)  V = 39.42 (cc)  Cp = 144.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.65 | 14.17 | 0.95 | 0.00 | 4.95 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.77 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.54 (gm/cc)
G = -1659927.01 (J)  H = -1236696.70 (J)  S = 277.87 (J/K)  V = 39.42 (cc)  Cp = 144.42 (J/K)

Oxygen  delta moles = 1.74748e-05  delta grams = 0.000559174
G = -6.16 (J)  H = 0.72 (J)  S = 0.00 (J/K)  V = 2.21 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1240.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.17  COH = 2.08  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.54 (gm/cc) viscosity = 3.83 (log 10 poise) (analysis in wt %)
G = -1657155.67 (J) H = -1238143.11 (J) S = 276.91 (J/K) V = 39.39 (cc) Cp = 144.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.65 | 14.17 | 0.95 | 0.00 | 4.95 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.83 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1657155.67 (J) H = -1238143.11 (J) S = 276.91 (J/K) V = 39.39 (cc) Cp = 144.42 (J/K)

Oxygen delta moles = 2.22171e-05 delta grams = 0.000710922
G = -7.77 (J) H = 0.91 (J) S = 0.01 (J/K) V = 2.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1230.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.16 COH = 2.06 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.54 (gm/cc) viscosity = 3.88 (log 10 poise) (analysis in wt %)
G = -1654394.10 (J) H = -1239589.64 (J) S = 275.96 (J/K) V = 39.36 (cc) Cp = 144.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.47 | 0.65 | 14.17 | 0.95 | 0.00 | 4.94 | 0.11 | 2.67 | 0.00 | 0.00 | 4.36 | 3.83 | 1.68 | 0.16 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1654394.10 (J) H = -1239589.64 (J) S = 275.96 (J/K) V = 39.36 (cc) Cp = 144.41 (J/K)

Oxygen delta moles = 2.74036e-05 delta grams = 0.000876883
G = -9.52 (J) H = 1.12 (J) S = 0.01 (J/K) V = 3.42 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 99.07 (gm) density = 2.54 (gm/cc) viscosity = 3.98 (log 10 poise) (analysis in wt %)
G = -1637148.05 (J) H = -1230283.60 (J) S = 272.49 (J/K) V = 39.01 (cc) Cp = 142.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.58 | 0.65 | 14.28 | 0.94 | 0.00 | 4.86 | 0.11 | 2.44 | 0.00 | 0.00 | 4.39 | 3.86 | 1.69 | 0.16 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.93 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.45Mg1.44Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -14472.35 (J) H = -11110.59 (J) S = 2.25 (J/K) V = 0.28 (cc) Cp = 1.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -46.84 | 95.24 | 45.42 | 3.75 | -3.50 | 5.60 | 0.32 |

Total solids mass = 0.93 (gm) density = 3.30 (gm/cc)
G = -14472.35 (J) H = -11110.59 (J) S = 2.25 (J/K) V = 0.28 (cc) Cp = 1.16 (J/K)

Viscosity of the System: 3.99 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1651620.40 (J) H = -1241394.19 (J) S = 274.74 (J/K) V = 39.29 (cc) Cp = 144.07 (J/K)

Oxygen delta moles = -9.69029e-06 delta grams = -0.000310078
G = 3.34 (J) H = -0.39 (J) S = -0.00 (J/K) V = -1.20 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 98.40 (gm) density = 2.54 (gm/cc) viscosity = 4.06 (log 10 poise) (analysis in wt %)
G = -1624088.56 (J) H = -1224038.82 (J) S = 269.73 (J/K) V = 38.75 (cc) Cp = 141.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.67 | 0.66 | 14.36 | 0.93 | 0.00 | 4.79 | 0.11 | 2.28 | 0.00 | 0.00 | 4.41 | 3.89 | 1.70 | 0.16 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.60 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.47Mg1.42Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -24774.31 (J) H = -19052.94 (J) S = 3.86 (J/K) V = 0.48 (cc) Cp = 1.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -48.29 | 94.99 | 47.00 | 3.84 | -3.58 | 5.71 | 0.34 |

Total solids mass = 1.60 (gm) density = 3.30 (gm/cc)
G = -24774.31 (J) H = -19052.94 (J) S = 3.86 (J/K) V = 0.48 (cc) Cp = 1.98 (J/K)

Viscosity of the System: 4.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1648862.86 (J) H = -1243091.76 (J) S = 273.59 (J/K) V = 39.23 (cc) Cp = 143.82 (J/K)

Oxygen delta moles = -3.82198e-05 delta grams = -0.00122299
G = 13.08 (J) H = -1.53 (J) S = -0.01 (J/K) V = -4.71 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 97.75 (gm) density = 2.54 (gm/cc) viscosity = 4.15 (log 10 poise) (analysis in wt %)
G = -1611410.13 (J) H = -1217993.92 (J) S = 267.06 (J/K) V = 38.49 (cc) Cp = 134.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.75 | 0.66 | 14.44 | 0.92 | 0.00 | 4.72 | 0.11 | 2.13 | 0.00 | 0.00 | 4.43 | 3.91 | 1.72 | 0.17 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.25 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.49Mg1.40Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -34705.49 (J) H = -26737.29 (J) S = 5.41 (J/K) V = 0.68 (cc) Cp = 2.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -49.78 | 94.73 | 48.61 | 3.93 | -3.67 | 5.83 | 0.35 |

Total solids mass = 2.25 (gm) density = 3.31 (gm/cc)
G = -34705.49 (J) H = -26737.29 (J) S = 5.41 (J/K) V = 0.68 (cc) Cp = 2.78 (J/K)

Viscosity of the System: 4.18 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1646115.62 (J) H = -1244731.21 (J) S = 272.47 (J/K) V = 39.17 (cc) Cp = 136.87 (J/K)

Oxygen delta moles = -6.88108e-05 delta grams = -0.00220186
G = 23.37 (J) H = -2.73 (J) S = -0.02 (J/K) V = -8.43 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 97.11 (gm) density = 2.54 (gm/cc) viscosity = 4.24 (log 10 poise) (analysis in wt %)
G = -1599078.17 (J) H = -1212150.12 (J) S = 264.45 (J/K) V = 38.25 (cc) Cp = 133.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.84 | 0.66 | 14.52 | 0.91 | 0.00 | 4.64 | 0.11 | 1.99 | 0.00 | 0.00 | 4.45 | 3.94 | 1.73 | 0.17 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.89 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.50Mg1.38Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -44300.10 (J) H = -34188.46 (J) S = 6.91 (J/K) V = 0.87 (cc) Cp = 3.56 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-51.29 94.46 50.25 4.02 -3.76 5.95 0.37

Total solids mass = 2.89 (gm) density = 3.32 (gm/cc)
G = -44300.10 (J) H = -34188.46 (J) S = 6.91 (J/K) V = 0.87 (cc) Cp = 3.56 (J/K)

Viscosity of the System: 4.28 (log 10 poise)

System mass = 100.00 (gm) density = 2.56 (gm/cc)
G = -1643378.27 (J) H = -1246338.58 (J) S = 271.36 (J/K) V = 39.12 (cc) Cp = 136.65 (J/K)

Oxygen delta moles = -0.00010159 delta grams = -0.00325077
G = 34.23 (J) H = -3.99 (J) S = -0.03 (J/K) V = -12.36 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1180.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.13 COH = 1.97 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 96.48 (gm) density = 2.54 (gm/cc) viscosity = 4.33 (log 10 poise) (analysis in wt %)
G = -1587067.12 (J) H = -1206510.98 (J) S = 261.88 (J/K) V = 38.01 (cc) Cp = 132.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.93 | 0.67 | 14.60 | 0.90 | 0.00 | 4.55 | 0.12 | 1.85 | 0.00 | 0.00 | 4.47 | 3.97 | 1.74 | 0.17 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.51 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.52Mg1.36Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -53583.63 (J) H = -41424.83 (J) S = 8.37 (J/K) V = 1.05 (cc) Cp = 4.32 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-52.82 94.18 51.93 4.12 -3.86 6.07 0.38

Total solids mass = 3.51 (gm) density = 3.33 (gm/cc)
G = -53583.63 (J) H = -41424.83 (J) S = 8.37 (J/K) V = 1.05 (cc) Cp = 4.32 (J/K)

Viscosity of the System: 4.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.56 (gm/cc)
G = -1640650.76 (J) H = -1247935.81 (J) S = 270.25 (J/K) V = 39.06 (cc) Cp = 136.43 (J/K)

Oxygen delta moles = -0.000136656 delta grams = -0.00437281
G = 45.70 (J) H = -5.31 (J) S = -0.04 (J/K) V = -16.51 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f6i2m2

T = 1170.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.12 COH = 1.95 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 95.87 (gm) density = 2.54 (gm/cc) viscosity = 4.42 (log 10 poise) (analysis in wt %)
G = -1575354.36 (J) H = -1201060.80 (J) S = 259.36 (J/K) V = 37.77 (cc) Cp = 131.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.02 | 0.67 | 14.67 | 0.89 | 0.00 | 4.46 | 0.12 | 1.73 | 0.00 | 0.00 | 4.49 | 3.99 | 1.75 | 0.17 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.12 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.54Mg1.34Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -62578.70 (J) H = -48462.73 (J) S = 9.78 (J/K) V = 1.24 (cc) Cp = 5.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.38 | 93.90 | 53.62 | 4.22 | -3.96 | 6.20 | 0.40 |

Total solids mass = 4.12 (gm) density = 3.34 (gm/cc)
G = -62578.70 (J) H = -48462.73 (J) S = 9.78 (J/K) V = 1.24 (cc) Cp = 5.05 (J/K)

Viscosity of the System: 4.48 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1637933.06 (J) H = -1249523.53 (J) S = 269.14 (J/K) V = 39.01 (cc) Cp = 136.21 (J/K)

Oxygen delta moles = -0.000174088 delta grams = -0.0055706
G = 57.77 (J) H = -6.70 (J) S = -0.04 (J/K) V = -20.89 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1160.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.12 COH = 1.93 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 95.27 (gm) density = 2.54 (gm/cc) viscosity = 4.51 (log 10 poise) (analysis in wt %)
G = -1563919.67 (J) H = -1195785.49 (J) S = 256.87 (J/K) V = 37.54 (cc) Cp = 130.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.11 | 0.68 | 14.75 | 0.87 | 0.00 | 4.37 | 0.12 | 1.60 | 0.00 | 0.00 | 4.50 | 4.02 | 1.76 | 0.17 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.73 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.55Mg1.31Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -71305.50 (J) H = -55316.84 (J) S = 11.16 (J/K) V = 1.41 (cc) Cp = 5.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.95 | 93.60 | 55.34 | 4.33 | -4.07 | 6.33 | 0.42 |

Total solids mass = 4.73 (gm) density = 3.35 (gm/cc)
G = -71305.50 (J) H = -55316.84 (J) S = 11.16 (J/K) V = 1.41 (cc) Cp = 5.77 (J/K)

Viscosity of the System: 4.58 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1635225.17 (J) H = -1251102.33 (J) S = 268.03 (J/K) V = 38.95 (cc) Cp = 135.99 (J/K)

Oxygen delta moles = -0.000213953 delta grams = -0.00684625

G = 70.45 (J)  H = -8.16 (J)  S = -0.05 (J/K)  V = -25.49 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1150.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.11  COH = 1.91  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.67 (gm)  density = 2.54 (gm/cc)  viscosity = 4.61 (log 10 poise)  (analysis in wt %)
G = -1552745.21 (J)  H = -1190672.50 (J)  S = 254.42 (J/K)  V = 37.31 (cc)  Cp = 129.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.20 | 0.68 | 14.82 | 0.86 | 0.00 | 4.26 | 0.12 | 1.49 | 0.00 | 0.00 | 4.52 | 4.04 | 1.77 | 0.17 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.32 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.57Mg1.29Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -79781.87 (J)  H = -62000.20 (J)  S = 12.49 (J/K)  V = 1.59 (cc)  Cp = 6.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.53 | 93.30 | 57.07 | 4.44 | -4.18 | 6.47 | 0.43 |

Total solids  mass = 5.32 (gm)  density = 3.35 (gm/cc)
G = -79781.87 (J)  H = -62000.20 (J)  S = 12.49 (J/K)  V = 1.59 (cc)  Cp = 6.47 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.57 (gm/cc)
G = -1632527.08 (J)  H = -1252672.71 (J)  S = 266.91 (J/K)  V = 38.90 (cc)  Cp = 135.78 (J/K)

Oxygen  delta moles = -0.000256302  delta grams = -0.00820135
G = 83.74 (J)  H = -9.68 (J)  S = -0.07 (J/K)  V = -30.33 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1140.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.89  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.09 (gm)  density = 2.54 (gm/cc)  viscosity = 4.70 (log 10 poise)  (analysis in wt %)
G = -1541815.48 (J)  H = -1185710.85 (J)  S = 251.99 (J/K)  V = 37.09 (cc)  Cp = 128.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.30 | 0.68 | 14.89 | 0.84 | 0.00 | 4.16 | 0.12 | 1.38 | 0.00 | 0.00 | 4.53 | 4.06 | 1.78 | 0.17 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.90 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.07Fe"0.59Mg1.27Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -88023.34 (J)  H = -68524.22 (J)  S = 13.80 (J/K)  V = 1.75 (cc)  Cp = 7.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.12 | 92.98 | 58.80 | 4.56 | -4.30 | 6.62 | 0.45 |

Total solids mass = 5.90 (gm) density = 3.36 (gm/cc)
G = -88023.34 (J) H = -68524.22 (J) S = 13.80 (J/K) V = 1.75 (cc) Cp = 7.16 (J/K)

Viscosity of the System: 4.78 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1629838.82 (J) H = -1254235.07 (J) S = 265.79 (J/K) V = 38.85 (cc) Cp = 135.58 (J/K)

Oxygen delta moles = -0.000301164 delta grams = -0.0096369
G = 97.63 (J) H = -11.27 (J) S = -0.08 (J/K) V = -35.38 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1130.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.87 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 93.51 (gm) density = 2.54 (gm/cc) viscosity = 4.80 (log 10 poise) (analysis in wt %)
G = -1531117.20 (J) H = -1180891.03 (J) S = 249.60 (J/K) V = 36.87 (cc) Cp = 127.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.40 | 0.69 | 14.96 | 0.83 | 0.00 | 4.04 | 0.12 | 1.28 | 0.00 | 0.00 | 4.55 | 4.09 | 1.79 | 0.17 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.48 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.61Mg1.25Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -96043.22 (J) H = -74898.73 (J) S = 15.07 (J/K) V = 1.92 (cc) Cp = 7.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.71 | 92.67 | 60.54 | 4.69 | -4.42 | 6.77 | 0.47 |

Total solids mass = 6.48 (gm) density = 3.37 (gm/cc)
G = -96043.22 (J) H = -74898.73 (J) S = 15.07 (J/K) V = 1.92 (cc) Cp = 7.83 (J/K)

Viscosity of the System: 4.89 (log 10 poise)

System mass = 99.99 (gm) density = 2.58 (gm/cc)
G = -1627160.42 (J) H = -1255789.77 (J) S = 264.67 (J/K) V = 38.79 (cc) Cp = 135.37 (J/K)

Oxygen delta moles = -0.000348553 delta grams = -0.0111533
G = 112.10 (J) H = -12.92 (J) S = -0.09 (J/K) V = -40.66 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 92.05 (gm) density = 2.53 (gm/cc) viscosity = 4.92 (log 10 poise) (analysis in wt %)
G = -1508164.10 (J) H = -1166898.41 (J) S = 244.96 (J/K) V = 36.36 (cc) Cp = 125.44 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.72 0.69 15.08 0.78 0.00 3.77 0.12 1.19 0.00 0.00 4.41 4.14 1.82 0.18 1.10 0.00 0.00 0.00 0.00

orthopyroxene mass = 1.19 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.61Mg1.24Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -17589.66 (J) H = -13748.83 (J) S = 2.76 (J/K) V = 0.35 (cc) Cp = 1.44 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-61.56 92.69 61.24 4.83 -4.55 6.86 0.49

clinopyroxene mass = 6.75 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.63Mg1.08Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -98732.33 (J) H = -76935.79 (J) S = 15.65 (J/K) V = 2.00 (cc) Cp = 7.99 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-55.70 81.47 63.20 6.07 -5.54 9.02 1.47

Total solids mass = 7.94 (gm) density = 3.38 (gm/cc)
G = -116322.00 (J) H = -90684.62 (J) S = 18.40 (J/K) V = 2.35 (cc) Cp = 9.43 (J/K)

Viscosity of the System: 5.03 (log 10 poise)

System mass = 99.99 (gm) density = 2.58 (gm/cc)
G = -1624486.10 (J) H = -1257583.02 (J) S = 263.36 (J/K) V = 38.72 (cc) Cp = 134.87 (J/K)

Oxygen delta moles = -0.000410868 delta grams = -0.0131473
G = 131.09 (J) H = -15.08 (J) S = -0.10 (J/K) V = -47.59 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f6i2m2

T = 1110.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.08 COH = 1.83 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 91.12 (gm) density = 2.53 (gm/cc) viscosity = 5.03 (log 10 poise) (analysis in wt %)
G = -1492658.05 (J) H = -1158352.43 (J) S = 241.70 (J/K) V = 36.03 (cc) Cp = 124.07 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.92 0.70 15.17 0.75 0.00 3.60 0.12 1.10 0.00 0.00 4.34 4.18 1.84 0.18 1.11 0.00 0.00 0.00 0.00

clinopyroxene mass = 8.86 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.64Mg1.05Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -129172.27 (J) H = -100886.97 (J) S = 20.45 (J/K) V = 2.62 (cc) Cp = 10.46 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-55.44 80.07 63.90 6.30 -5.73 9.29 1.62

Total solids mass = 8.86 (gm) density = 3.38 (gm/cc)
G = -129172.27 (J) H = -100886.97 (J) S = 20.45 (J/K) V = 2.62 (cc) Cp = 10.46 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 99.99 (gm) density = 2.59 (gm/cc)
G = -1621830.32 (J) H = -1259239.40 (J) S = 262.15 (J/K) V = 38.65 (cc) Cp = 134.54 (J/K)

Oxygen delta moles = -0.000462457 delta grams = -0.0147981
G = 146.37 (J) H = -16.80 (J) S = -0.12 (J/K) V = -53.18 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1100.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.81 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 87.09 (gm) density = 2.52 (gm/cc) viscosity = 5.13 (log 10 poise) (analysis in wt %)
G = -1425122.20 (J) H = -1108847.56 (J) S = 230.33 (J/K) V = 34.50 (cc) Cp = 118.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.41 | 0.73 | 14.90 | 0.73 | 0.00 | 3.50 | 0.13 | 1.00 | 0.00 | 0.00 | 4.22 | 4.12 | 1.91 | 0.19 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 9.78 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.66Mg1.03Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -141523.71 (J) H = -110698.68 (J) S = 22.45 (J/K) V = 2.88 (cc) Cp = 11.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.83 | 80.17 | 66.23 | 6.20 | -5.62 | 9.21 | 1.63 |

feldspar mass = 3.12 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.60Ca0.38Al1.38Si2.62O8
G = -52518.68 (J) H = -42171.04 (J) S = 7.54 (J/K) V = 1.19 (cc) Cp = 3.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.63 | 38.34 | 2.03 |

Total solids mass = 12.90 (gm) density = 3.17 (gm/cc)
G = -194042.39 (J) H = -152869.73 (J) S = 29.98 (J/K) V = 4.07 (cc) Cp = 15.32 (J/K)

Viscosity of the System: 5.34 (log 10 poise)

System mass = 99.98 (gm) density = 2.59 (gm/cc)
G = -1619164.59 (J) H = -1261717.29 (J) S = 260.31 (J/K) V = 38.56 (cc) Cp = 133.63 (J/K)

Oxygen delta moles = -0.000560033 delta grams = -0.0179204
G = 175.82 (J) H = -20.14 (J) S = -0.14 (J/K) V = -63.94 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 83.24 (gm) density = 2.52 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1360966.02 (J) H = -1061729.29 (J) S = 219.52 (J/K) V = 33.03 (cc) Cp = 112.85 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.90 0.76 14.63 0.71 0.00 3.40 0.13 0.91 0.00 0.00 4.10 4.06 1.99 0.19 1.21 0.00 0.00 0.00 0.00

clinopyroxene mass = 10.63 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.69Mg1.01Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -152816.97 (J) H = -119715.27 (J) S = 24.28 (J/K) V = 3.13 (cc) Cp = 12.46 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-60.16 80.28 68.52 6.09 -5.49 9.11 1.64

feldspar mass = 6.10 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.60Ca0.37Al1.37Si2.63O8
G = -102732.96 (J) H = -82672.20 (J) S = 14.72 (J/K) V = 2.32 (cc) Cp = 7.47 (J/K)
albite anorthite sanidine
60.47 37.39 2.14

Total solids mass = 16.74 (gm) density = 3.07 (gm/cc)
G = -255549.93 (J) H = -202387.47 (J) S = 39.00 (J/K) V = 5.45 (cc) Cp = 19.93 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 99.98 (gm) density = 2.60 (gm/cc)
G = -1616515.95 (J) H = -1264116.76 (J) S = 258.52 (J/K) V = 38.48 (cc) Cp = 132.78 (J/K)

Oxygen delta moles = -0.000659903 delta grams = -0.0211161
G = 205.49 (J) H = -23.50 (J) S = -0.17 (J/K) V = -74.79 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f6i2m2

T = 1080.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.06 COH = 1.76 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 79.69 (gm) density = 2.52 (gm/cc) viscosity = 5.33 (log 10 poise) (analysis in wt %)
G = -1301790.55 (J) H = -1018275.18 (J) S = 209.52 (J/K) V = 31.68 (cc) Cp = 107.81 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.39 0.80 14.36 0.69 0.00 3.28 0.14 0.84 0.00 0.00 3.99 3.98 2.06 0.20 1.27 0.00 0.00 0.00 0.00

clinopyroxene mass = 11.43 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.71Mg0.99Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -163104.96 (J) H = -127980.22 (J) S = 25.96 (J/K) V = 3.35 (cc) Cp = 13.34 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-62.31 80.34 70.70 5.99 -5.37 9.00 1.65

feldspar mass = 8.86 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.61Ca0.37Al1.37Si2.63O8
G = -148989.47 (J) H = -120159.73 (J) S = 21.31 (J/K) V = 3.38 (cc) Cp = 10.84 (J/K)
albite anorthite sanidine
61.23 36.52 2.25

Total solids mass = 20.29 (gm) density = 3.02 (gm/cc)
G = -312094.43 (J) H = -248139.95 (J) S = 47.26 (J/K) V = 6.72 (cc) Cp = 24.18 (J/K)

Viscosity of the System: 5.70 (log 10 poise)

System mass = 99.98 (gm) density = 2.60 (gm/cc)
G = -1613884.97 (J) H = -1266415.13 (J) S = 256.79 (J/K) V = 38.41 (cc) Cp = 131.99 (J/K)

Oxygen delta moles = -0.000759857 delta grams = -0.0243145
G = 234.69 (J) H = -26.78 (J) S = -0.19 (J/K) V = -85.49 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1070.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.05 COH = 1.74 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 76.39 (gm) density = 2.51 (gm/cc) viscosity = 5.42 (log 10 poise) (analysis in wt %)
G = -1247173.99 (J) H = -978176.94 (J) S = 200.27 (J/K) V = 30.43 (cc) Cp = 103.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.87 | 0.83 | 14.11 | 0.67 | 0.00 | 3.15 | 0.15 | 0.77 | 0.00 | 0.00 | 3.89 | 3.91 | 2.13 | 0.21 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 12.16 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.73Mg0.97Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -172490.96 (J) H = -135573.52 (J) S = 27.49 (J/K) V = 3.55 (cc) Cp = 14.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.28 | 80.36 | 72.75 | 5.89 | -5.25 | 8.87 | 1.66 |

feldspar mass = 11.42 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.62Ca0.36Al1.36Si2.64O8
G = -191606.38 (J) H = -154871.23 (J) S = 27.35 (J/K) V = 4.35 (cc) Cp = 13.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.92 | 35.73 | 2.35 |

Total solids mass = 23.58 (gm) density = 2.98 (gm/cc)
G = -364097.34 (J) H = -290444.76 (J) S = 54.84 (J/K) V = 7.90 (cc) Cp = 28.10 (J/K)

Viscosity of the System: 5.89 (log 10 poise)

System mass = 99.97 (gm) density = 2.61 (gm/cc)
G = -1611271.34 (J) H = -1268621.70 (J) S = 255.11 (J/K) V = 38.33 (cc) Cp = 131.25 (J/K)

Oxygen delta moles = -0.000859403 delta grams = -0.0274999
G = 263.25 (J) H = -29.98 (J) S = -0.22 (J/K) V = -95.97 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1060.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.04 COH = 1.72 IW

= 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 73.35 (gm) density = 2.51 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -1196738.32 (J) H = -941158.25 (J) S = 191.71 (J/K) V = 29.27 (cc) Cp = 98.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.34 | 0.86 | 13.87 | 0.64 | 0.00 | 3.02 | 0.15 | 0.70 | 0.00 | 0.00 | 3.80 | 3.82 | 2.20 | 0.22 | 1.38 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 12.84 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.75Mg0.95Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -181059.48 (J) H = -142560.42 (J) S = 28.88 (J/K) V = 3.74 (cc) Cp = 14.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.05 | 80.33 | 74.66 | 5.79 | -5.13 | 8.74 | 1.67 |

feldspar mass = 13.78 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.02Na0.63Ca0.35Al1.35Si2.65O8
G = -230877.00 (J) H = -187025.96 (J) S = 32.89 (J/K) V = 5.25 (cc) Cp = 16.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.55 | 35.00 | 2.46 |

Total solids mass = 26.62 (gm) density = 2.96 (gm/cc)
G = -411936.48 (J) H = -329586.38 (J) S = 61.77 (J/K) V = 8.99 (cc) Cp = 31.71 (J/K)

Viscosity of the System: 6.07 (log 10 poise)

System mass = 99.97 (gm) density = 2.61 (gm/cc)
G = -1608674.80 (J) H = -1270744.63 (J) S = 253.48 (J/K) V = 38.26 (cc) Cp = 130.57 (J/K)

Oxygen delta moles = -0.000958014 delta grams = -0.0306553
G = 291.02 (J) H = -33.07 (J) S = -0.24 (J/K) V = -106.19 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f6i2m2

T = 1050.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.04 COH = 1.70 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 70.53 (gm) density = 2.50 (gm/cc) viscosity = 5.62 (log 10 poise) (analysis in wt %)
G = -1150140.52 (J) H = -906968.36 (J) S = 183.78 (J/K) V = 28.19 (cc) Cp = 94.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.80 | 0.89 | 13.63 | 0.62 | 0.00 | 2.87 | 0.16 | 0.65 | 0.00 | 0.00 | 3.72 | 3.73 | 2.28 | 0.23 | 1.43 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 13.47 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.76Mg0.93Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -188882.21 (J) H = -148995.95 (J) S = 30.14 (J/K) V = 3.92 (cc) Cp = 15.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.62 | 80.25 | 76.42 | 5.69 | -5.01 | 8.59 | 1.68 |

feldspar mass = 15.96 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -267072.44 (J) H = -216826.92 (J) S = 37.97 (J/K) V = 6.08 (cc) Cp = 19.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.12 | 34.33 | 2.56 |

Total solids mass = 29.44 (gm) density = 2.94 (gm/cc)
G = -455954.64 (J) H = -365822.87 (J) S = 68.12 (J/K) V = 10.00 (cc) Cp = 35.04 (J/K)

Viscosity of the System: 6.26 (log 10 poise)

System mass = 99.97 (gm) density = 2.62 (gm/cc)
G = -1606095.16 (J) H = -1272791.23 (J) S = 251.90 (J/K) V = 38.20 (cc) Cp = 129.93 (J/K)

Oxygen delta moles = -0.00105516 delta grams = -0.0337638
G = 317.86 (J) H = -36.05 (J) S = -0.27 (J/K) V = -116.08 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1040.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.03 COH = 1.67 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 67.92 (gm) density = 2.50 (gm/cc) viscosity = 5.71 (log 10 poise) (analysis in wt %)
G = -1107062.79 (J) H = -875374.68 (J) S = 176.44 (J/K) V = 27.20 (cc) Cp = 91.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.25 | 0.93 | 13.41 | 0.59 | 0.00 | 2.72 | 0.16 | 0.60 | 0.00 | 0.00 | 3.64 | 3.64 | 2.34 | 0.24 | 1.49 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 14.06 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.78Mg0.92Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -196022.38 (J) H = -154928.34 (J) S = 31.29 (J/K) V = 4.08 (cc) Cp = 16.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.00 | 80.14 | 78.04 | 5.59 | -4.90 | 8.44 | 1.69 |

feldspar mass = 17.98 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.64Ca0.34Al1.34Si2.66O8
G = -300447.10 (J) H = -244466.40 (J) S = 42.63 (J/K) V = 6.85 (cc) Cp = 22.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.64 | 33.71 | 2.65 |

Total solids mass = 32.04 (gm) density = 2.93 (gm/cc)
G = -496469.48 (J) H = -399394.74 (J) S = 73.93 (J/K) V = 10.93 (cc) Cp = 38.29 (J/K)

Viscosity of the System: 6.46 (log 10 poise)

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1603532.27 (J) H = -1274769.41 (J) S = 250.36 (J/K) V = 38.13 (cc) Cp = 129.51 (J/K)

Oxygen delta moles = -0.00115033 delta grams = -0.0368093

G = 343.61 (J)  H = -38.88 (J)  S = -0.29 (J/K)  V = -125.59 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1030.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.02  COH = 1.65  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 64.27 (gm)  density = 2.49 (gm/cc)  viscosity = 5.76 (log 10 poise)  (analysis in wt %)
G = -1046815.87 (J)  H = -829664.57 (J)  S = 166.64 (J/K)  V = 25.78 (cc)  Cp = 86.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.43 | 0.98 | 13.28 | 0.57 | 0.00 | 2.60 | 0.17 | 0.55 | 0.00 | 0.00 | 3.57 | 3.57 | 2.45 | 0.25 | 1.57 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 14.67 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.79Mg0.90Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -203535.72 (J)  H = -161197.92 (J)  S = 32.49 (J/K)  V = 4.25 (cc)  Cp = 16.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.95 | 79.76 | 79.37 | 5.55 | -4.82 | 8.35 | 1.73 |

feldspar  mass = 20.22 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.03Na0.64Ca0.33Al1.33Si2.67O8
G = -337352.01 (J)  H = -275110.94 (J)  S = 47.76 (J/K)  V = 7.71 (cc)  Cp = 24.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.98 | 33.23 | 2.79 |

quartz  mass = 0.80 (gm)  density = 2.56 (gm/cc)
SiO2
G = -13285.11 (J)  H = -10954.41 (J)  S = 1.79 (J/K)  V = 0.31 (cc)  Cp = 0.95 (J/K)

Total solids  mass = 35.69 (gm)  density = 2.91 (gm/cc)
G = -554172.85 (J)  H = -447263.28 (J)  S = 82.04 (J/K)  V = 12.27 (cc)  Cp = 42.62 (J/K)

Viscosity of the System: 6.66 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.63 (gm/cc)
G = -1600988.72 (J)  H = -1276927.84 (J)  S = 248.68 (J/K)  V = 38.05 (cc)  Cp = 128.86 (J/K)

Oxygen  delta moles = -0.00123895  delta grams = -0.0396448
G = 366.94 (J)  H = -41.43 (J)  S = -0.31 (J/K)  V = -134.24 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f6i2m2

T = 1020.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.01  COH = 1.63  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 60.05 (gm)  density = 2.49 (gm/cc)  viscosity = 5.77 (log 10 poise)  (analysis in wt %)
G = -977049.62 (J)  H = -775931.18 (J)  S = 155.53 (J/K)  V = 24.12 (cc)  Cp = 80.56 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.38 1.04 13.24 0.55 0.00 2.50 0.19 0.51 0.00 0.00 3.51 3.53 2.60 0.27 1.68 0.00 0.00 0.00 0.00

clinopyroxene mass = 15.28 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.80Mg0.88Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -211092.11 (J) H = -167547.06 (J) S = 33.67 (J/K) V = 4.42 (cc) Cp = 17.49 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-70.51 79.18 80.42 5.57 -4.76 8.32 1.79

feldspar mass = 22.51 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.64Ca0.33Al1.33Si2.67O8
G = -374925.22 (J) H = -306439.80 (J) S = 52.96 (J/K) V = 8.58 (cc) Cp = 27.61 (J/K)
albite anorthite sanidine
64.19 32.85 2.96

quartz mass = 2.13 (gm) density = 2.56 (gm/cc)
SiO2
G = -35400.50 (J) H = -29254.49 (J) S = 4.75 (J/K) V = 0.83 (cc) Cp = 2.53 (J/K)

Total solids mass = 39.91 (gm) density = 2.89 (gm/cc)
G = -621417.83 (J) H = -503241.34 (J) S = 91.39 (J/K) V = 13.83 (cc) Cp = 47.63 (J/K)

Viscosity of the System: 6.90 (log 10 poise)

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1598467.45 (J) H = -1279172.53 (J) S = 246.91 (J/K) V = 37.95 (cc) Cp = 128.18 (J/K)

Oxygen delta moles = -0.00131919 delta grams = -0.0422127
G = 387.38 (J) H = -43.64 (J) S = -0.33 (J/K) V = -141.84 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 1010.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.00 COH = 1.60 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 56.26 (gm) density = 2.49 (gm/cc) viscosity = 5.77 (log 10 poise) (analysis in wt %)
G = -914708.76 (J) H = -727894.26 (J) S = 145.59 (J/K) V = 22.63 (cc) Cp = 75.48 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.33 1.11 13.21 0.53 0.00 2.39 0.20 0.48 0.00 0.00 3.45 3.48 2.74 0.29 1.80 0.00 0.00 0.00 0.00

clinopyroxene mass = 15.83 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.81Mg0.87Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -217912.00 (J) H = -173351.62 (J) S = 34.73 (J/K) V = 4.57 (cc) Cp = 18.07 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-70.88 78.56 81.31 5.59 -4.71 8.28 1.85

feldspar mass = 24.54 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.03Na0.64Ca0.32Al1.32Si2.68O8
G = -408209.04 (J) H = -334393.39 (J) S = 57.53 (J/K) V = 9.36 (cc) Cp = 30.08 (J/K)
albite anorthite sanidine
64.39 32.48 3.13

quartz mass = 3.31 (gm) density = 2.56 (gm/cc)
SiO2
G = -55136.59 (J) H = -45664.65 (J) S = 7.38 (J/K) V = 1.29 (cc) Cp = 3.94 (J/K)

Total solids mass = 43.69 (gm) density = 2.87 (gm/cc)
G = -681257.63 (J) H = -553409.66 (J) S = 99.64 (J/K) V = 15.22 (cc) Cp = 52.09 (J/K)

Viscosity of the System: 7.19 (log 10 poise)

System mass = 99.96 (gm) density = 2.64 (gm/cc)
G = -1595966.38 (J) H = -1281303.92 (J) S = 245.23 (J/K) V = 37.85 (cc) Cp = 127.57 (J/K)

Oxygen delta moles = -0.00139404 delta grams = -0.0446077
G = 405.84 (J) H = -45.62 (J) S = -0.35 (J/K) V = -148.72 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 1000.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = -0.00 COH = 1.58 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 52.86 (gm) density = 2.48 (gm/cc) viscosity = 5.78 (log 10 poise) (analysis in wt %)
G = -858696.47 (J) H = -684710.19 (J) S = 136.66 (J/K) V = 21.29 (cc) Cp = 70.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.26 | 1.17 | 13.19 | 0.51 | 0.00 | 2.28 | 0.21 | 0.45 | 0.00 | 0.00 | 3.39 | 3.44 | 2.88 | 0.31 | 1.91 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 16.34 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.82Mg0.85Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -224093.91 (J) H = -178685.93 (J) S = 35.67 (J/K) V = 4.71 (cc) Cp = 18.61 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-71.07 77.93 82.04 5.62 -4.65 8.22 1.91

feldspar mass = 26.36 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.65Ca0.32Al1.32Si2.68O8
G = -437831.04 (J) H = -359463.42 (J) S = 61.55 (J/K) V = 10.05 (cc) Cp = 32.28 (J/K)
albite anorthite sanidine
64.59 32.11 3.30

quartz mass = 4.39 (gm) density = 2.56 (gm/cc)
SiO2
G = -72863.26 (J) H = -60478.87 (J) S = 9.73 (J/K) V = 1.71 (cc) Cp = 5.21 (J/K)

Total solids mass = 47.09 (gm) density = 2.86 (gm/cc)
G = -734788.20 (J) H = -598628.22 (J) S = 106.95 (J/K) V = 16.47 (cc) Cp = 56.09 (J/K)

Viscosity of the System: 7.57 (log 10 poise)

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1593484.67 (J) H = -1283338.40 (J) S = 243.61 (J/K) V = 37.77 (cc) Cp = 127.00 (J/K)

Oxygen delta moles = -0.00146375 delta grams = -0.0468384
G = 422.44 (J) H = -47.37 (J) S = -0.37 (J/K) V = -154.94 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 49.76 (gm) density = 2.48 (gm/cc) viscosity = 5.78 (log 10 poise) (analysis in wt %)
G = -807637.04 (J) H = -645309.91 (J) S = 128.51 (J/K) V = 20.07 (cc) Cp = 66.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.17 | 1.23 | 13.24 | 0.49 | 0.00 | 2.18 | 0.22 | 0.42 | 0.00 | 0.00 | 3.29 | 3.39 | 3.03 | 0.32 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 16.29 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.84Mg0.84Fe'"0.04Ti0.01Al0.16Si1.91O6
G = -222357.23 (J) H = -177653.99 (J) S = 35.39 (J/K) V = 4.69 (cc) Cp = 18.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.09 | 78.46 | 83.51 | 5.67 | -4.64 | 8.19 | 1.91 |

clinopyroxene mass = 0.61 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.73Fe"0.42Mg0.60Fe'"0.06Ti0.03Al0.24Si1.85O6
G = -9003.56 (J) H = -7334.84 (J) S = 1.32 (J/K) V = 0.18 (cc) Cp = 0.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.48 | 20.27 | 41.77 | 9.00 | -2.30 | 8.47 | 6.30 |

feldspar mass = 27.89 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.65Ca0.32Al1.32Si2.68O8
G = -462407.98 (J) H = -380481.47 (J) S = 64.86 (J/K) V = 10.63 (cc) Cp = 34.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.96 | 31.55 | 3.49 |

quartz mass = 5.40 (gm) density = 2.56 (gm/cc)
SiO2
G = -89625.96 (J) H = -74555.81 (J) S = 11.93 (J/K) V = 2.11 (cc) Cp = 6.41 (J/K)

Total solids mass = 50.20 (gm) density = 2.85 (gm/cc)
G = -783394.73 (J) H = -640026.11 (J) S = 113.50 (J/K) V = 17.61 (cc) Cp = 59.72 (J/K)

Viscosity of the System: 8.15 (log 10 poise)

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1591031.76 (J) H = -1285336.02 (J) S = 242.01 (J/K) V = 37.68 (cc) Cp = 126.47 (J/K)

Oxygen delta moles = -0.00150984 delta grams = -0.0483129

G = 431.93 (J)  H = -48.32 (J)  S = -0.38 (J/K)  V = -158.57 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 980.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = -0.02  COH = 1.53
IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 47.06 (gm)  density = 2.48 (gm/cc)  viscosity = 5.78 (log 10 poise)  (analysis in wt %)
G = -762415.68 (J)  H = -610288.47 (J)  S = 121.40 (J/K)  V = 18.99 (cc)  Cp = 63.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.99 | 1.24 | 13.26 | 0.51 | 0.00 | 2.22 | 0.24 | 0.37 | 0.00 | 0.00 | 3.20 | 3.33 | 3.16 | 0.34 | 2.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.18 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.92Mg0.95Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -123576.53 (J)  H = -98865.93 (J)  S = 19.72 (J/K)  V = 2.61 (cc)  Cp = 10.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.76 | 94.24 | 91.63 | 5.00 | -4.59 | 7.04 | 0.45 |

clinopyroxene  mass = 4.65 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.89Mg0.80Fe'"0.04Ti0.01Al0.16Si1.90O6
G = -62636.60 (J)  H = -50058.25 (J)  S = 10.04 (J/K)  V = 1.33 (cc)  Cp = 5.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.24 | 79.15 | 88.61 | 5.76 | -4.72 | 8.54 | 1.90 |

clinopyroxene  mass = 3.39 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.74Fe"0.44Mg0.56Fe'"0.07Ti0.04Al0.25Si1.84O6
G = -49210.60 (J)  H = -40146.18 (J)  S = 7.23 (J/K)  V = 1.00 (cc)  Cp = 3.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 14.06 | 19.26 | 43.65 | 9.63 | -1.82 | 8.61 | 6.61 |

feldspar  mass = 29.34 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.04Na0.65Ca0.31Al1.31Si2.69O8
G = -485715.98 (J)  H = -400550.49 (J)  S = 67.96 (J/K)  V = 11.18 (cc)  Cp = 35.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.17 | 31.15 | 3.68 |

quartz  mass = 6.34 (gm)  density = 2.56 (gm/cc)
SiO2
G = -105062.30 (J)  H = -87588.05 (J)  S = 13.94 (J/K)  V = 2.48 (cc)  Cp = 7.52 (J/K)

Total solids  mass = 52.89 (gm)  density = 2.84 (gm/cc)
G = -826202.01 (J)  H = -677208.90 (J)  S = 118.89 (J/K)  V = 18.60 (cc)  Cp = 62.98 (J/K)

Viscosity of the System: 9.73 (log 10 poise)

System  mass = 99.95 (gm)  density = 2.66 (gm/cc)
G = -1588617.68 (J)  H = -1287497.37 (J)  S = 240.29 (J/K)  V = 37.59 (cc)  Cp = 126.09 (J/K)

Oxygen  delta moles = -0.00151543  delta grams = -0.0484921

G = 429.72 (J)  H = -47.96 (J)  S = -0.38 (J/K)  V = -157.89 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 970.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = -0.03  COH = 1.50
IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 44.24 (gm)  density = 2.47 (gm/cc)  viscosity = 5.78 (log 10 poise)  (analysis in wt %)
G = -716303.96 (J)  H = -574513.83 (J)  S = 114.06 (J/K)  V = 17.89 (cc)  Cp = 59.33 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.94 | 1.18 | 13.32 | 0.49 | 0.00 | 2.14 | 0.25 | 0.33 | 0.00 | 0.00 | 3.11 | 3.28 | 3.31 | 0.37 | 2.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.89 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.92Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -172204.23 (J)  H = -137981.23 (J)  S = 27.53 (J/K)  V = 3.65 (cc)  Cp = 14.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.83 | 94.50 | 94.27 | 5.12 | -4.73 | 7.24 | 0.44 |

clinopyroxene  mass = 4.68 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.75Fe"0.44Mg0.55Fe'"0.07Ti0.04Al0.25Si1.83O6
G = -67784.22 (J)  H = -55414.26 (J)  S = 9.95 (J/K)  V = 1.37 (cc)  Cp = 5.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 13.49 | 18.57 | 44.35 | 9.82 | -1.66 | 8.65 | 6.79 |

feldspar  mass = 30.73 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.04Na0.65Ca0.31Al1.31Si2.69O8
G = -508004.86 (J)  H = -419861.68 (J)  S = 70.90 (J/K)  V = 11.72 (cc)  Cp = 37.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.36 | 30.73 | 3.91 |

quartz  mass = 7.30 (gm)  density = 2.56 (gm/cc)
SiO2
G = -120849.57 (J)  H = -100969.69 (J)  S = 15.99 (J/K)  V = 2.85 (cc)  Cp = 8.65 (J/K)

rhm-oxide  mass = 0.11 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.17Al0.14Ti0.84O3
G = -1070.21 (J)  H = -811.58 (J)  S = 0.21 (J/K)  V = 0.02 (cc)  Cp = 0.10 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.26 | 8.70 | 70.06 | 3.17 | 6.82 |

Total solids  mass = 55.71 (gm)  density = 2.84 (gm/cc)
G = -869913.09 (J)  H = -715038.45 (J)  S = 124.58 (J/K)  V = 19.62 (cc)  Cp = 66.29 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.66 (gm/cc)
G = -1586217.06 (J)  H = -1289552.28 (J)  S = 238.64 (J/K)  V = 37.51 (cc)  Cp = 125.62 (J/K)

Oxygen  delta moles = -0.00152662  delta grams = -0.0488499

G = 429.05 (J)  H = -47.77 (J)  S = -0.38 (J/K)  V = -157.79 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f6i2m2

T = 960.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = -0.04  COH = 1.47
IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 41.58 (gm)  density = 2.47 (gm/cc)  viscosity = 5.78 (log 10 poise)  (analysis in wt %)
G = -673150.58 (J)  H = -541018.25 (J)  S = 107.15 (J/K)  V = 16.86 (cc)  Cp = 55.78 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.93 | 1.11 | 13.39 | 0.46 | 0.00 | 1.99 | 0.26 | 0.31 | 0.00 | 0.00 | 3.02 | 3.23 | 3.47 | 0.39 | 2.43 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.92 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.92Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -172021.14 (J)  H = -138157.38 (J)  S = 27.46 (J/K)  V = 3.65 (cc)  Cp = 14.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.90 | 94.67 | 95.15 | 5.18 | -4.80 | 7.27 | 0.43 |

clinopyroxene  mass = 5.02 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.75Fe"0.44Mg0.54Fe'"0.07Ti0.04Al0.25Si1.83O6
G = -72622.68 (J)  H = -59525.87 (J)  S = 10.62 (J/K)  V = 1.47 (cc)  Cp = 5.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 14.36 | 17.80 | 44.01 | 9.96 | -1.61 | 8.55 | 6.93 |

feldspar  mass = 32.01 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.04Na0.66Ca0.30Al1.30Si2.70O8
G = -528376.59 (J)  H = -437666.78 (J)  S = 73.56 (J/K)  V = 12.20 (cc)  Cp = 39.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.54 | 30.32 | 4.14 |

quartz  mass = 8.19 (gm)  density = 2.56 (gm/cc)
SiO2
G = -135380.58 (J)  H = -113356.87 (J)  S = 17.86 (J/K)  V = 3.20 (cc)  Cp = 9.70 (J/K)

rhm-oxide  mass = 0.22 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.17Al0.13Ti0.85O3
G = -2273.46 (J)  H = -1729.34 (J)  S = 0.44 (J/K)  V = 0.05 (cc)  Cp = 0.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.08 | 8.60 | 70.28 | 3.30 | 6.73 |

Total solids  mass = 58.37 (gm)  density = 2.84 (gm/cc)
G = -910674.45 (J)  H = -750436.23 (J)  S = 129.94 (J/K)  V = 20.58 (cc)  Cp = 69.36 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.67 (gm/cc)
G = -1583825.03 (J)  H = -1291454.47 (J)  S = 237.09 (J/K)  V = 37.44 (cc)  Cp = 125.14 (J/K)

Oxygen  delta moles = -0.00155154  delta grams = -0.0496473

G = 432.16 (J)  H = -47.99 (J)  S = -0.39 (J/K)  V = -159.08 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 950.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = -0.05  COH = 1.45
IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 39.18 (gm)  density = 2.46 (gm/cc)  viscosity = 5.78 (log 10 poise)  (analysis in wt %)
G = -634141.07 (J)  H = -510710.81 (J)  S = 100.91 (J/K)  V = 15.92 (cc)  Cp = 52.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.90 | 1.04 | 13.47 | 0.44 | 0.00 | 1.86 | 0.27 | 0.29 | 0.00 | 0.00 | 2.93 | 3.18 | 3.63 | 0.41 | 2.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.95 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.91Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -171861.76 (J)  H = -138357.18 (J)  S = 27.39 (J/K)  V = 3.66 (cc)  Cp = 14.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.90 | 94.85 | 95.96 | 5.24 | -4.88 | 7.30 | 0.43 |

clinopyroxene  mass = 5.32 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.76Fe"0.44Mg0.54Fe'"0.07Ti0.04Al0.26Si1.83O6
G = -76908.67 (J)  H = -63204.79 (J)  S = 11.20 (J/K)  V = 1.56 (cc)  Cp = 5.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.23 | 17.06 | 43.65 | 10.12 | -1.57 | 8.45 | 7.07 |

feldspar  mass = 33.17 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.04Na0.66Ca0.30Al1.30Si2.70O8
G = -546756.33 (J)  H = -453894.22 (J)  S = 75.92 (J/K)  V = 12.65 (cc)  Cp = 40.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.70 | 29.93 | 4.37 |

quartz  mass = 9.00 (gm)  density = 2.56 (gm/cc)
SiO2
G = -148490.92 (J)  H = -124604.74 (J)  S = 19.53 (J/K)  V = 3.51 (cc)  Cp = 10.64 (J/K)

rhm-oxide  mass = 0.33 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.70Mg0.11Fe'"0.17Al0.13Ti0.85O3
G = -3288.89 (J)  H = -2509.46 (J)  S = 0.64 (J/K)  V = 0.07 (cc)  Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.92 | 8.49 | 70.49 | 3.44 | 6.65 |

Total solids  mass = 60.77 (gm)  density = 2.83 (gm/cc)
G = -947306.57 (J)  H = -782570.38 (J)  S = 134.68 (J/K)  V = 21.45 (cc)  Cp = 72.13 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.67 (gm/cc)
G = -1581447.64 (J)  H = -1293281.19 (J)  S = 235.59 (J/K)  V = 37.37 (cc)  Cp = 124.70 (J/K)

Oxygen  delta moles = -0.0015776  delta grams = -0.0504813

G = 435.46 (J)  H = -48.23 (J)  S = -0.40 (J/K)  V = -160.44 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 940.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = -0.06  COH = 1.42
IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 37.00 (gm)  density = 2.46 (gm/cc)  viscosity = 5.78 (log 10 poise)  (analysis in wt %)
G = -598679.53 (J)  H = -483131.69 (J)  S = 95.25 (J/K)  V = 15.07 (cc)  Cp = 49.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.85 | 0.98 | 13.55 | 0.41 | 0.00 | 1.73 | 0.28 | 0.27 | 0.00 | 0.00 | 2.86 | 3.13 | 3.78 | 0.44 | 2.73 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.98 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.97Mg0.90Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -171714.45 (J)  H = -138570.69 (J)  S = 27.32 (J/K)  V = 3.66 (cc)  Cp = 14.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.83 | 95.02 | 96.70 | 5.31 | -4.96 | 7.33 | 0.42 |

clinopyroxene  mass = 5.59 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.76Fe"0.43Mg0.53Fe'"0.07Ti0.04Al0.26Si1.83O6
G = -80731.88 (J)  H = -66521.31 (J)  S = 11.71 (J/K)  V = 1.64 (cc)  Cp = 6.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.08 | 16.35 | 43.27 | 10.29 | -1.54 | 8.35 | 7.20 |

feldspar  mass = 34.24 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.66Ca0.30Al1.30Si2.70O8
G = -563417.77 (J)  H = -468760.75 (J)  S = 78.03 (J/K)  V = 13.05 (cc)  Cp = 41.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.84 | 29.55 | 4.60 |

quartz  mass = 9.73 (gm)  density = 2.56 (gm/cc)
SiO2
G = -160392.81 (J)  H = -134883.96 (J)  S = 21.03 (J/K)  V = 3.80 (cc)  Cp = 11.50 (J/K)

rhm-oxide  mass = 0.41 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.17Al0.13Ti0.85O3
G = -4148.16 (J)  H = -3174.93 (J)  S = 0.80 (J/K)  V = 0.09 (cc)  Cp = 0.39 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.77 | 8.37 | 70.71 | 3.57 | 6.57 |

Total solids  mass = 62.95 (gm)  density = 2.83 (gm/cc)
G = -980405.08 (J)  H = -811911.64 (J)  S = 138.89 (J/K)  V = 22.25 (cc)  Cp = 74.63 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.68 (gm/cc)
G = -1579084.61 (J)  H = -1295043.33 (J)  S = 234.14 (J/K)  V = 37.31 (cc)  Cp = 124.29 (J/K)

Oxygen  delta moles = -0.0016045  delta grams = -0.051342

G = 438.87 (J)  H = -48.48 (J)  S = -0.40 (J/K)  V = -161.84 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 930.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.36  delta HM = -5.02  NNO = 0.00  QFM = -0.07  COH = 1.39
IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid  mass = 35.00 (gm)  density = 2.45 (gm/cc)  viscosity = 5.78 (log 10 poise)  (analysis in wt %)
G = -566275.52 (J)  H = -457902.36 (J)  S = 90.07 (J/K)  V = 14.28 (cc)  Cp = 47.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.78 | 0.92 | 13.63 | 0.39 | 0.00 | 1.61 | 0.29 | 0.26 | 0.00 | 0.00 | 2.79 | 3.07 | 3.93 | 0.46 | 2.89 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 13.01 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.90Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -171572.99 (J)  H = -138792.36 (J)  S = 27.25 (J/K)  V = 3.67 (cc)  Cp = 14.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.71 | 95.20 | 97.39 | 5.38 | -5.04 | 7.36 | 0.42 |

clinopyroxene  mass = 5.83 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.77Fe"0.43Mg0.53Fe'"0.07Ti0.04Al0.26Si1.83O6
G = -84163.78 (J)  H = -69531.38 (J)  S = 12.16 (J/K)  V = 1.71 (cc)  Cp = 6.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.92 | 15.68 | 42.87 | 10.48 | -1.51 | 8.24 | 7.33 |

feldspar  mass = 35.21 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.66Ca0.29Al1.29Si2.71O8
G = -578587.11 (J)  H = -482445.49 (J)  S = 79.91 (J/K)  V = 13.43 (cc)  Cp = 42.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.97 | 29.19 | 4.84 |

quartz  mass = 10.41 (gm)  density = 2.56 (gm/cc)
SiO2
G = -171259.94 (J)  H = -144334.29 (J)  S = 22.38 (J/K)  V = 4.06 (cc)  Cp = 12.28 (J/K)

rhm-oxide  mass = 0.49 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.17Al0.13Ti0.85O3
G = -4876.36 (J)  H = -3743.93 (J)  S = 0.94 (J/K)  V = 0.11 (cc)  Cp = 0.46 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.63 | 8.25 | 70.92 | 3.70 | 6.50 |

Total solids  mass = 64.94 (gm)  density = 2.83 (gm/cc)
G = -1010460.17 (J)  H = -838847.45 (J)  S = 142.64 (J/K)  V = 22.97 (cc)  Cp = 76.90 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.68 (gm/cc)
G = -1576735.69 (J)  H = -1296749.81 (J)  S = 232.71 (J/K)  V = 37.26 (cc)  Cp = 123.90 (J/K)

Oxygen  delta moles = -0.00163199  delta grams = -0.0522217

G = 442.31 (J)  H = -48.73 (J)  S = -0.41 (J/K)  V = -163.25 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 920.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = -0.08  COH = 1.36
IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 33.14 (gm)  density = 2.44 (gm/cc)  viscosity = 5.77 (log 10 poise)  (analysis in wt %)
G = -535997.29 (J)  H = -434246.49 (J)  S = 85.28 (J/K)  V = 13.56 (cc)  Cp = 44.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.81 | 0.86 | 13.60 | 0.36 | 0.00 | 1.46 | 0.30 | 0.25 | 0.00 | 0.00 | 2.68 | 3.08 | 4.08 | 0.47 | 3.05 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 1.26 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.57Mg0.25)3Al2Si3O12
G = -17221.36 (J)  H = -14193.80 (J)  S = 2.54 (J/K)  V = 0.32 (cc)  Cp = 1.37 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.98 | 17.59 | 25.43 |

orthopyroxene  mass = 12.15 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.91Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -160323.95 (J)  H = -130079.52 (J)  S = 25.35 (J/K)  V = 3.43 (cc)  Cp = 13.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.97 | 95.30 | 96.78 | 5.29 | -4.97 | 7.16 | 0.42 |

clinopyroxene  mass = 6.14 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.78Fe"0.42Mg0.53Fe'"0.06Ti0.05Al0.26Si1.83O6
G = -88736.08 (J)  H = -73525.16 (J)  S = 12.75 (J/K)  V = 1.80 (cc)  Cp = 6.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.81 | 14.95 | 41.75 | 10.51 | -1.38 | 7.87 | 7.50 |

feldspar  mass = 35.48 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.67Ca0.28Al1.28Si2.72O8
G = -582051.71 (J)  H = -486363.52 (J)  S = 80.20 (J/K)  V = 13.54 (cc)  Cp = 43.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.61 | 28.20 | 5.19 |

quartz  mass = 11.22 (gm)  density = 2.56 (gm/cc)
SiO2
G = -184342.96 (J)  H = -155695.51 (J)  S = 24.01 (J/K)  V = 4.38 (cc)  Cp = 13.23 (J/K)

rhm-oxide  mass = 0.55 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.16Al0.13Ti0.86O3
G = -5477.24 (J)  H = -4219.61 (J)  S = 1.05 (J/K)  V = 0.12 (cc)  Cp = 0.52 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.73 | 8.02 | 71.00 | 3.89 | 6.35 |

apatite  mass = 0.02 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -227.34 (J)  H = -187.69 (J)  S = 0.03 (J/K)  V = 0.01 (cc)  Cp = 0.02 (J/K)

Total solids mass = 66.81 (gm) density = 2.83 (gm/cc)
G = -1038380.63 (J) H = -864264.81 (J) S = 145.93 (J/K) V = 23.59 (cc) Cp = 78.96 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.69 (gm/cc)
G = -1574377.92 (J) H = -1298511.30 (J) S = 231.21 (J/K) V = 37.15 (cc) Cp = 123.46 (J/K)

Oxygen delta moles = -0.00170339 delta grams = -0.0545065
G = 457.40 (J) H = -50.26 (J) S = -0.43 (J/K) V = -168.98 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 910.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = -0.09 COH = 1.34 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 31.40 (gm) density = 2.44 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -507759.42 (J) H = -412128.49 (J) S = 80.83 (J/K) V = 12.88 (cc) Cp = 42.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.86 | 0.81 | 13.54 | 0.33 | 0.00 | 1.32 | 0.32 | 0.24 | 0.00 | 0.00 | 2.56 | 3.12 | 4.22 | 0.47 | 3.21 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.85 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.57Mg0.26)3Al2Si3O12
G = -39069.44 (J) H = -32280.99 (J) S = 5.74 (J/K) V = 0.73 (cc) Cp = 3.11 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.87 | 17.54 | 25.59 |

orthopyroxene mass = 11.05 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.96Mg0.92Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -145990.10 (J) H = -118825.39 (J) S = 22.96 (J/K) V = 3.12 (cc) Cp = 12.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.65 | 95.37 | 95.68 | 5.15 | -4.84 | 6.87 | 0.42 |

clinopyroxene mass = 6.45 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.78Fe"0.40Mg0.54Fe'"0.06Ti0.05Al0.26Si1.83O6
G = -93498.88 (J) H = -77706.92 (J) S = 13.35 (J/K) V = 1.90 (cc) Cp = 7.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.00 | 14.25 | 40.41 | 10.47 | -1.23 | 7.41 | 7.68 |

feldspar mass = 35.52 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.67Ca0.27Al1.27Si2.73O8
G = -581710.98 (J) H = -487094.74 (J) S = 79.97 (J/K) V = 13.56 (cc) Cp = 43.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.40 | 26.99 | 5.61 |

quartz mass = 12.03 (gm) density = 2.56 (gm/cc)
SiO2
G = -197495.68 (J) H = -167163.11 (J) S = 25.64 (J/K) V = 4.70 (cc) Cp = 14.17 (J/K)

rhm-oxide mass = 0.60 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.16Al0.12Ti0.86O3
G = -5984.54 (J) H = -4626.54 (J) S = 1.15 (J/K) V = 0.13 (cc) Cp = 0.57 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.93 | 7.76 | 71.03 | 4.10 | 6.18 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -521.31 (J) H = -431.41 (J) S = 0.08 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 68.54 (gm) density = 2.84 (gm/cc)
G = -1064270.93 (J) H = -888129.10 (J) S = 148.88 (J/K) V = 24.14 (cc) Cp = 80.85 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1572030.35 (J) H = -1300257.60 (J) S = 229.70 (J/K) V = 37.02 (cc) Cp = 123.02 (J/K)

Oxygen delta moles = -0.00178425 delta grams = -0.0570939
G = 474.66 (J) H = -52.01 (J) S = -0.45 (J/K) V = -175.52 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f6i2m2

T = 900.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.10 COH = 1.31 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 29.78 (gm) density = 2.43 (gm/cc) viscosity = 5.72 (log 10 poise) (analysis in wt %)
G = -481452.23 (J) H = -391483.50 (J) S = 76.69 (J/K) V = 12.25 (cc) Cp = 40.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.88 | 0.76 | 13.48 | 0.30 | 0.00 | 1.20 | 0.33 | 0.23 | 0.00 | 0.00 | 2.45 | 3.16 | 4.36 | 0.47 | 3.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.32 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -59178.31 (J) H = -49017.05 (J) S = 8.66 (J/K) V = 1.10 (cc) Cp = 4.71 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.76 | 17.48 | 25.77 |

orthopyroxene mass = 10.03 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.95Mg0.94Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -132671.52 (J) H = -108325.89 (J) S = 20.75 (J/K) V = 2.83 (cc) Cp = 11.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.32 | 95.45 | 94.56 | 5.01 | -4.71 | 6.59 | 0.43 |

clinopyroxene mass = 6.75 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.39Mg0.55Fe'"0.06Ti0.05Al0.25Si1.84O6
G = -97962.13 (J) H = -81660.73 (J) S = 13.90 (J/K) V = 1.99 (cc) Cp = 7.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.13 | 13.60 | 39.09 | 10.44 | -1.08 | 6.97 | 7.85 |

feldspar mass = 35.57 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.68Ca0.26Al1.26Si2.74O8
G = -581575.41 (J) H = -487999.86 (J) S = 79.76 (J/K) V = 13.59 (cc) Cp = 43.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.12 | 25.83 | 6.05 |

quartz mass = 12.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -209670.34 (J) H = -177848.66 (J) S = 27.12 (J/K) V = 5.00 (cc) Cp = 15.05 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.71Mg0.11Fe'"0.15Al0.12Ti0.86O3
G = -6418.42 (J) H = -4979.21 (J) S = 1.23 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.12 | 7.50 | 71.05 | 4.31 | 6.02 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -773.02 (J) H = -641.25 (J) S = 0.11 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 70.16 (gm) density = 2.84 (gm/cc)
G = -1088249.17 (J) H = -910472.64 (J) S = 151.54 (J/K) V = 24.66 (cc) Cp = 82.60 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.71 (gm/cc)
G = -1569701.39 (J) H = -1301956.14 (J) S = 228.23 (J/K) V = 36.91 (cc) Cp = 122.60 (J/K)

Oxygen delta moles = -0.00185825 delta grams = -0.0594617
G = 489.71 (J) H = -53.51 (J) S = -0.46 (J/K) V = -181.25 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 28.27 (gm) density = 2.43 (gm/cc) viscosity = 5.69 (log 10 poise) (analysis in wt %)
G = -456784.08 (J) H = -372083.32 (J) S = 72.82 (J/K) V = 11.65 (cc) Cp = 37.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.87 | 0.71 | 13.42 | 0.28 | 0.00 | 1.08 | 0.34 | 0.22 | 0.00 | 0.00 | 2.36 | 3.20 | 4.48 | 0.47 | 3.57 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.69 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -77769.94 (J) H = -64575.55 (J) S = 11.34 (J/K) V = 1.45 (cc) Cp = 6.20 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.64 | 17.41 | 25.94 |

orthopyroxene mass = 9.08 (gm) density = 3.53 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.04Fe"0.93Mg0.95Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -120236.66 (J) H = -98481.21 (J) S = 18.70 (J/K) V = 2.57 (cc) Cp = 10.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.98 | 95.53 | 93.42 | 4.87 | -4.59 | 6.32 | 0.43 |

clinopyroxene mass = 7.03 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.38Mg0.56Fe'"0.06Ti0.05Al0.25Si1.84O6
G = -102174.08 (J) H = -85424.54 (J) S = 14.40 (J/K) V = 2.07 (cc) Cp = 7.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.19 | 12.99 | 37.80 | 10.39 | -0.94 | 6.55 | 8.02 |

feldspar mass = 35.63 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.69Ca0.25Al1.25Si2.75O8
G = -581644.46 (J) H = -489079.14 (J) S = 79.58 (J/K) V = 13.62 (cc) Cp = 43.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.79 | 24.70 | 6.51 |

quartz mass = 13.50 (gm) density = 2.56 (gm/cc)
SiO2
G = -221002.57 (J) H = -187862.06 (J) S = 28.49 (J/K) V = 5.27 (cc) Cp = 15.87 (J/K)

rhm-oxide mass = 0.68 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.71Mg0.11Fe'"0.15Al0.12Ti0.87O3
G = -6790.21 (J) H = -5285.84 (J) S = 1.29 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.32 | 7.25 | 71.06 | 4.51 | 5.87 |

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -988.32 (J) H = -821.80 (J) S = 0.14 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 71.67 (gm) density = 2.85 (gm/cc)
G = -1110606.25 (J) H = -931530.15 (J) S = 153.96 (J/K) V = 25.15 (cc) Cp = 84.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.72 (gm/cc)
G = -1567390.34 (J) H = -1303613.47 (J) S = 226.78 (J/K) V = 36.80 (cc) Cp = 122.21 (J/K)

Oxygen delta moles = -0.00192616 delta grams = -0.0616347
G = 502.81 (J) H = -54.78 (J) S = -0.48 (J/K) V = -186.27 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 26.84 (gm) density = 2.42 (gm/cc) viscosity = 5.66 (log 10 poise) (analysis in wt %)
G = -433504.81 (J) H = -353731.47 (J) S = 69.18 (J/K) V = 11.09 (cc) Cp = 36.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

69.84 0.67 13.36 0.26 0.00 0.98 0.35 0.21 0.00 0.00 2.27 3.23 4.60 0.48 3.76 0.00 0.00 0.00 0.00

garnet mass = 6.96 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -95034.98 (J) H = -79105.82 (J) S = 13.81 (J/K) V = 1.78 (cc) Cp = 7.58 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.53 | 17.34 | 26.13 |

orthopyroxene mass = 8.18 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.92Mg0.97Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -108572.54 (J) H = -89205.50 (J) S = 16.79 (J/K) V = 2.32 (cc) Cp = 9.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.63 | 95.60 | 92.26 | 4.74 | -4.46 | 6.06 | 0.43 |

clinopyroxene mass = 7.29 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.37Mg0.57Fe'"0.05Ti0.05Al0.25Si1.84O6
G = -106174.94 (J) H = -89030.06 (J) S = 14.87 (J/K) V = 2.15 (cc) Cp = 8.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.19 | 12.41 | 36.53 | 10.35 | -0.80 | 6.13 | 8.19 |

feldspar mass = 35.71 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.69Ca0.24Al1.24Si2.76O8
G = -581919.31 (J) H = -490334.36 (J) S = 79.42 (J/K) V = 13.66 (cc) Cp = 43.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.39 | 23.60 | 7.01 |

quartz mass = 14.16 (gm) density = 2.56 (gm/cc)
SiO2
G = -231609.14 (J) H = -197298.14 (J) S = 29.75 (J/K) V = 5.53 (cc) Cp = 16.64 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.71Mg0.12Fe'"0.14Al0.11Ti0.87O3
G = -7109.00 (J) H = -5553.03 (J) S = 1.35 (J/K) V = 0.15 (cc) Cp = 0.67 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.51 | 7.01 | 71.05 | 4.70 | 5.73 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1171.86 (J) H = -976.73 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 73.10 (gm) density = 2.85 (gm/cc)
G = -1131591.77 (J) H = -951503.65 (J) S = 156.17 (J/K) V = 25.61 (cc) Cp = 85.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.72 (gm/cc)
G = -1565096.58 (J) H = -1305235.12 (J) S = 225.35 (J/K) V = 36.70 (cc) Cp = 121.85 (J/K)

Oxygen delta moles = -0.00198866 delta grams = -0.0636348
G = 514.18 (J) H = -55.85 (J) S = -0.49 (J/K) V = -190.67 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 870.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -12.45  delta HM = -5.07  NNO = 0.00  QFM = -0.13  COH = 1.22
IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid  mass = 25.48 (gm)  density = 2.41 (gm/cc)  viscosity = 5.62 (log 10 poise)  (analysis in wt %)
G = -411396.10 (J)  H = -336255.70 (J)  S = 65.73 (J/K)  V = 10.55 (cc)  Cp = 34.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.77 | 0.63 | 13.31 | 0.24 | 0.00 | 0.89 | 0.37 | 0.21 | 0.00 | 0.00 | 2.18 | 3.27 | 4.71 | 0.48 | 3.96 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 8.15 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.56Mg0.26)3Al2Si3O12
G = -111138.75 (J)  H = -92737.63 (J)  S = 16.10 (J/K)  V = 2.08 (cc)  Cp = 8.86 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.41 | 17.27 | 26.32 |

orthopyroxene  mass = 7.34 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.91Mg0.98Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -97581.08 (J)  H = -80424.00 (J)  S = 15.01 (J/K)  V = 2.08 (cc)  Cp = 8.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.28 | 95.68 | 91.08 | 4.60 | -4.34 | 5.81 | 0.44 |

clinopyroxene  mass = 7.54 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.35Mg0.58Fe'"0.05Ti0.05Al0.24Si1.85O6
G = -109998.62 (J)  H = -92504.13 (J)  S = 15.30 (J/K)  V = 2.23 (cc)  Cp = 8.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.13 | 11.87 | 35.27 | 10.31 | -0.67 | 5.73 | 8.36 |

feldspar  mass = 35.80 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.70Ca0.23Al1.23Si2.77O8
G = -582403.37 (J)  H = -491769.22 (J)  S = 79.28 (J/K)  V = 13.70 (cc)  Cp = 43.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.93 | 22.52 | 7.54 |

quartz  mass = 14.79 (gm)  density = 2.56 (gm/cc)
SiO2
G = -241592.23 (J)  H = -206240.11 (J)  S = 30.93 (J/K)  V = 5.78 (cc)  Cp = 17.36 (J/K)

rhm-oxide  mass = 0.74 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.71Mg0.12Fe'"0.14Al0.11Ti0.88O3
G = -7382.12 (J)  H = -5786.10 (J)  S = 1.40 (J/K)  V = 0.16 (cc)  Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.71 | 6.77 | 71.04 | 4.89 | 5.59 |

apatite  mass = 0.09 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1327.35 (J)  H = -1108.96 (J)  S = 0.19 (J/K)  V = 0.03 (cc)  Cp = 0.10 (J/K)

Total solids  mass = 74.45 (gm)  density = 2.86 (gm/cc)
G = -1151423.52 (J)  H = -970570.15 (J)  S = 158.21 (J/K)  V = 26.05 (cc)  Cp = 87.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.73 (gm/cc)
G = -1562819.62 (J) H = -1306825.85 (J) S = 223.94 (J/K) V = 36.61 (cc) Cp = 121.50 (J/K)

Oxygen delta moles = -0.00204636 delta grams = -0.065481
G = 524.01 (J) H = -56.74 (J) S = -0.51 (J/K) V = -194.50 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 24.19 (gm) density = 2.41 (gm/cc) viscosity = 5.56 (log 10 poise) (analysis in wt %)
G = -390263.85 (J) H = -319501.99 (J) S = 62.45 (J/K) V = 10.04 (cc) Cp = 32.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.68 | 0.59 | 13.25 | 0.22 | 0.00 | 0.80 | 0.38 | 0.20 | 0.00 | 0.00 | 2.11 | 3.30 | 4.81 | 0.49 | 4.17 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.26 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -126226.04 (J) H = -105584.93 (J) S = 18.22 (J/K) V = 2.36 (cc) Cp = 10.07 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.29 | 17.18 | 26.53 |

orthopyroxene mass = 6.55 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg1.00Fe'''0.01Ti0.00Al0.10Si1.94O6
G = -87176.14 (J) H = -72070.83 (J) S = 13.33 (J/K) V = 1.86 (cc) Cp = 7.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.91 | 95.76 | 89.89 | 4.47 | -4.22 | 5.57 | 0.44 |

clinopyroxene mass = 7.77 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.34Mg0.59Fe'''0.05Ti0.05Al0.24Si1.85O6
G = -113674.17 (J) H = -95869.81 (J) S = 15.71 (J/K) V = 2.30 (cc) Cp = 8.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.03 | 11.35 | 34.04 | 10.26 | -0.54 | 5.34 | 8.52 |

feldspar mass = 35.91 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.21Al1.21Si2.79O8
G = -583102.65 (J) H = -493389.64 (J) S = 79.17 (J/K) V = 13.75 (cc) Cp = 43.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.41 | 21.47 | 8.11 |

quartz mass = 15.39 (gm) density = 2.56 (gm/cc)
SiO2
G = -251042.93 (J) H = -214762.46 (J) S = 32.02 (J/K) V = 6.01 (cc) Cp = 18.05 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.71Mg0.12Fe'''0.13Al0.11Ti0.88O3
G = -7615.47 (J) H = -5989.33 (J) S = 1.44 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)

geikielite hematite ilmenite pyrophanite corundum
11.91 6.54 71.01 5.08 5.46

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1457.76 (J) H = -1220.79 (J) S = 0.21 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

Total solids mass = 75.75 (gm) density = 2.86 (gm/cc)
G = -1170295.16 (J) H = -988887.81 (J) S = 160.09 (J/K) V = 26.48 (cc) Cp = 88.63 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.74 (gm/cc)
G = -1560559.01 (J) H = -1308389.80 (J) S = 222.54 (J/K) V = 36.52 (cc) Cp = 121.17 (J/K)

Oxygen delta moles = -0.00209978 delta grams = -0.0671903
G = 532.48 (J) H = -57.48 (J) S = -0.52 (J/K) V = -197.83 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f6i2m2

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 22.94 (gm) density = 2.40 (gm/cc) viscosity = 5.50 (log 10 poise) (analysis in wt %)
G = -369932.00 (J) H = -303329.65 (J) S = 59.30 (J/K) V = 9.54 (cc) Cp = 30.88 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.56 0.55 13.20 0.20 0.00 0.73 0.40 0.20 0.00 0.00 2.05 3.34 4.89 0.51 4.39 0.00 0.00 0.00 0.00

garnet mass = 10.31 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -140424.89 (J) H = -117748.86 (J) S = 20.19 (J/K) V = 2.63 (cc) Cp = 11.20 (J/K)
almandine grossular pyrope
56.17 17.10 26.74

orthopyroxene mass = 5.80 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.89Mg1.01Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -77281.30 (J) H = -64087.28 (J) S = 11.75 (J/K) V = 1.65 (cc) Cp = 6.64 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-90.53 95.84 88.67 4.34 -4.10 5.34 0.44

clinopyroxene mass = 8.00 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.33Mg0.60Fe'"0.05Ti0.05Al0.24Si1.85O6
G = -117226.73 (J) H = -99147.19 (J) S = 16.10 (J/K) V = 2.37 (cc) Cp = 8.95 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
32.88 10.86 32.81 10.22 -0.42 4.96 8.68

feldspar mass = 36.03 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.71Ca0.20Al1.20Si2.80O8
G = -584026.09 (J) H = -495204.16 (J) S = 79.08 (J/K) V = 13.80 (cc) Cp = 43.63 (J/K)

albite anorthite sanidine
70.83 20.45 8.72

quartz mass = 15.96 (gm) density = 2.56 (gm/cc)
SiO2
G = -260044.16 (J) H = -222933.31 (J) S = 33.04 (J/K) V = 6.24 (cc) Cp = 18.70 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.71Mg0.12Fe"'0.13Al0.11Ti0.88O3
G = -7813.80 (J) H = -6166.15 (J) S = 1.47 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.12 6.32 70.98 5.26 5.33

apatite mass = 0.11 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1565.40 (J) H = -1314.02 (J) S = 0.22 (J/K) V = 0.04 (cc) Cp = 0.12 (J/K)

Total solids mass = 76.99 (gm) density = 2.86 (gm/cc)
G = -1188382.39 (J) H = -1006600.97 (J) S = 161.85 (J/K) V = 26.89 (cc) Cp = 89.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.74 (gm/cc)
G = -1558314.39 (J) H = -1309930.62 (J) S = 221.15 (J/K) V = 36.43 (cc) Cp = 120.85 (J/K)

Oxygen delta moles = -0.00214938 delta grams = -0.0687776
G = 539.74 (J) H = -58.08 (J) S = -0.53 (J/K) V = -200.71 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 21.73 (gm) density = 2.40 (gm/cc) viscosity = 5.43 (log 10 poise) (analysis in wt %)
G = -350237.35 (J) H = -287607.23 (J) S = 56.26 (J/K) V = 9.06 (cc) Cp = 29.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.40 | 0.51 | 13.15 | 0.18 | 0.00 | 0.66 | 0.41 | 0.19 | 0.00 | 0.00 | 1.99 | 3.39 | 4.96 | 0.52 | 4.64 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.31 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -153849.65 (J) H = -129320.08 (J) S = 22.04 (J/K) V = 2.88 (cc) Cp = 12.28 (J/K)
almandine grossular pyrope
56.04 17.00 26.96

orthopyroxene mass = 5.08 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.87Mg1.03Fe"'0.01Ti0.00Al0.10Si1.95O6
G = -67828.00 (J) H = -56420.38 (J) S = 10.25 (J/K) V = 1.45 (cc) Cp = 5.83 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-89.13 95.92 87.42 4.21 -3.98 5.12 0.44

clinopyroxene mass = 8.22 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.32Mg0.60Fe'"0.04Ti0.05Al0.24Si1.86O6
G = -120678.41 (J) H = -102353.98 (J) S = 16.46 (J/K) V = 2.44 (cc) Cp = 9.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.68 | 10.39 | 31.60 | 10.19 | -0.29 | 4.59 | 8.84 |

feldspar mass = 36.16 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.71Ca0.19Al1.19Si2.81O8
G = -585185.91 (J) H = -497224.15 (J) S = 79.02 (J/K) V = 13.86 (cc) Cp = 43.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.19 | 19.44 | 9.38 |

quartz mass = 16.52 (gm) density = 2.56 (gm/cc)
SiO2
G = -268673.25 (J) H = -230816.58 (J) S = 34.01 (J/K) V = 6.45 (cc) Cp = 19.32 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.71Mg0.12Fe'"0.12Al0.10Ti0.89O3
G = -7980.84 (J) H = -6319.24 (J) S = 1.49 (J/K) V = 0.17 (cc) Cp = 0.75 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.33 | 6.10 | 70.93 | 5.43 | 5.21 |

apatite mass = 0.11 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1652.04 (J) H = -1390.00 (J) S = 0.24 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 78.20 (gm) density = 2.87 (gm/cc)
G = -1205848.10 (J) H = -1023844.41 (J) S = 163.50 (J/K) V = 27.29 (cc) Cp = 91.28 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.75 (gm/cc)
G = -1556085.45 (J) H = -1311451.63 (J) S = 219.77 (J/K) V = 36.35 (cc) Cp = 120.55 (J/K)

Oxygen delta moles = -0.00219558 delta grams = -0.0702561
G = 545.90 (J) H = -58.55 (J) S = -0.54 (J/K) V = -203.20 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 830.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.17 COH = 1.09 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 20.55 (gm) density = 2.39 (gm/cc) viscosity = 5.35 (log 10 poise) (analysis in wt %)
G = -331025.02 (J) H = -272208.84 (J) S = 53.32 (J/K) V = 8.59 (cc) Cp = 27.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.21 | 0.47 | 13.09 | 0.17 | 0.00 | 0.60 | 0.43 | 0.18 | 0.00 | 0.00 | 1.94 | 3.44 | 5.01 | 0.54 | 4.91 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.26 (gm) density = 3.92 (gm/cc) (analysis in mole %)

(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -166603.26 (J) H = -140380.65 (J) S = 23.77 (J/K) V = 3.13 (cc) Cp = 13.30 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.90 | 16.90 | 27.20 |

orthopyroxene mass = 4.39 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.04Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -58754.23 (J) H = -49021.91 (J) S = 8.82 (J/K) V = 1.25 (cc) Cp = 5.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.72 | 96.00 | 86.14 | 4.08 | -3.86 | 4.90 | 0.45 |

clinopyroxene mass = 8.44 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.30Mg0.61Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -124048.83 (J) H = -105506.04 (J) S = 16.81 (J/K) V = 2.50 (cc) Cp = 9.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.44 | 9.94 | 30.40 | 10.16 | -0.17 | 4.24 | 9.00 |

feldspar mass = 36.31 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.18Al1.18Si2.82O8
G = -586597.89 (J) H = -499464.17 (J) S = 78.99 (J/K) V = 13.93 (cc) Cp = 43.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.47 | 18.45 | 10.08 |

quartz mass = 17.05 (gm) density = 2.56 (gm/cc)
SiO2
G = -277004.32 (J) H = -238473.99 (J) S = 34.93 (J/K) V = 6.66 (cc) Cp = 19.93 (J/K)

rhm-oxide mass = 0.82 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.71Mg0.13Fe'"0.12Al0.10Ti0.89O3
G = -8119.47 (J) H = -6450.65 (J) S = 1.51 (J/K) V = 0.18 (cc) Cp = 0.76 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.54 | 5.88 | 70.88 | 5.60 | 5.10 |

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1718.91 (J) H = -1449.65 (J) S = 0.24 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 79.38 (gm) density = 2.87 (gm/cc)
G = -1222846.91 (J) H = -1040747.06 (J) S = 165.07 (J/K) V = 27.68 (cc) Cp = 92.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.76 (gm/cc)
G = -1553871.94 (J) H = -1312955.91 (J) S = 218.39 (J/K) V = 36.27 (cc) Cp = 120.27 (J/K)

Oxygen delta moles = -0.00223876 delta grams = -0.0716376
G = 551.11 (J) H = -58.91 (J) S = -0.55 (J/K) V = -205.34 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06
IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 19.38 (gm) density = 2.39 (gm/cc) viscosity = 5.25 (log 10 poise) (analysis in wt %)
G = -312144.36 (J) H = -257010.86 (J) S = 50.44 (J/K) V = 8.12 (cc) Cp = 26.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.97 | 0.43 | 13.04 | 0.16 | 0.00 | 0.54 | 0.45 | 0.18 | 0.00 | 0.00 | 1.91 | 3.50 | 5.05 | 0.57 | 5.20 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.16 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -178779.12 (J) H = -151005.39 (J) S = 25.41 (J/K) V = 3.36 (cc) Cp = 14.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.76 | 16.80 | 27.45 |

orthopyroxene mass = 3.73 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.06Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -50003.56 (J) H = -41847.65 (J) S = 7.46 (J/K) V = 1.06 (cc) Cp = 4.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.27 | 96.08 | 84.83 | 3.96 | -3.74 | 4.70 | 0.45 |

clinopyroxene mass = 8.65 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.29Mg0.62Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -127355.55 (J) H = -108617.67 (J) S = 17.14 (J/K) V = 2.57 (cc) Cp = 9.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.15 | 9.51 | 29.22 | 10.14 | -0.05 | 3.88 | 9.16 |

feldspar mass = 36.48 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.72Ca0.17Al1.17Si2.83O8
G = -588281.88 (J) H = -501942.43 (J) S = 78.98 (J/K) V = 14.00 (cc) Cp = 44.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.69 | 17.48 | 10.84 |

quartz mass = 17.57 (gm) density = 2.56 (gm/cc)
SiO2
G = -285110.65 (J) H = -245967.09 (J) S = 35.81 (J/K) V = 6.86 (cc) Cp = 20.51 (J/K)

rhm-oxide mass = 0.83 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.71Mg0.13Fe'"0.11Al0.10Ti0.89O3
G = -8231.77 (J) H = -6561.81 (J) S = 1.53 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.77 | 5.67 | 70.82 | 5.75 | 4.99 |

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1766.74 (J) H = -1493.47 (J) S = 0.25 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 80.54 (gm) density = 2.87 (gm/cc)
G = -1239529.28 (J) H = -1057435.51 (J) S = 166.58 (J/K) V = 28.07 (cc) Cp = 93.82 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.76 (gm/cc)
G = -1551673.65 (J) H = -1314446.37 (J) S = 217.01 (J/K) V = 36.19 (cc) Cp = 120.01 (J/K)

Oxygen delta moles = -0.00227923 delta grams = -0.0729326
G = 555.44 (J) H = -59.18 (J) S = -0.56 (J/K) V = -207.15 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 18.21 (gm) density = 2.38 (gm/cc) viscosity = 5.12 (log 10 poise) (analysis in wt %)
G = -293105.15 (J) H = -241581.47 (J) S = 47.57 (J/K) V = 7.65 (cc) Cp = 24.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 0.39 | 12.92 | 0.15 | 0.00 | 0.51 | 0.51 | 0.17 | 0.00 | 0.00 | 1.88 | 3.61 | 5.04 | 0.60 | 5.53 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.81 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -187177.29 (J) H = -158465.95 (J) S = 26.51 (J/K) V = 3.52 (cc) Cp = 14.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.85 | 16.71 | 27.44 |

orthopyroxene mass = 3.52 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.84Mg1.07Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -47113.08 (J) H = -39537.22 (J) S = 6.99 (J/K) V = 1.00 (cc) Cp = 4.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.61 | 96.18 | 84.26 | 3.84 | -3.63 | 4.52 | 0.45 |

clinopyroxene mass = 8.05 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.28Mg0.63Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -118664.73 (J) H = -101466.62 (J) S = 15.88 (J/K) V = 2.39 (cc) Cp = 9.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.47 | 9.17 | 28.44 | 9.92 | 0.07 | 3.59 | 9.35 |

clinopyroxene mass = 0.88 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.24Mg0.36Fe'"0.04Ti0.39Al0.72Si1.28O6
G = -12861.19 (J) H = -11033.51 (J) S = 1.69 (J/K) V = 0.25 (cc) Cp = 0.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.82 | 2.10 | 23.68 | 68.60 | 9.36 | -5.58 | 8.65 |

feldspar mass = 36.58 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.16Al1.16Si2.84O8
G = -588733.50 (J) H = -503364.53 (J) S = 78.82 (J/K) V = 14.05 (cc) Cp = 44.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.88 | 16.37 | 11.75 |

quartz mass = 18.12 (gm) density = 2.56 (gm/cc)
SiO2
G = -293723.91 (J) H = -253927.11 (J) S = 36.74 (J/K) V = 7.08 (cc) Cp = 21.14 (J/K)

rhm-oxide mass = 0.64 (gm) density = 4.61 (gm/cc) (analysis in mole %)

Mn0.06Fe"0.71Mg0.13Fe'''0.11Al0.10Ti0.90O3
G = -6304.76 (J) H = -5041.33 (J) S = 1.17 (J/K) V = 0.14 (cc) Cp = 0.59 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.85 | 5.53 | 70.65 | 6.12 | 4.86 |

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1795.24 (J) H = -1521.10 (J) S = 0.25 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 81.71 (gm) density = 2.87 (gm/cc)
G = -1256373.71 (J) H = -1074357.38 (J) S = 168.04 (J/K) V = 28.47 (cc) Cp = 95.12 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.77 (gm/cc)
G = -1549478.86 (J) H = -1315938.85 (J) S = 215.61 (J/K) V = 36.12 (cc) Cp = 119.76 (J/K)

Oxygen delta moles = -0.00233947 delta grams = -0.0748604
G = 564.36 (J) H = -59.92 (J) S = -0.58 (J/K) V = -210.68 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 800.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.20 COH = 0.99 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 16.84 (gm) density = 2.37 (gm/cc) viscosity = 4.92 (log 10 poise) (analysis in wt %)
G = -270900.14 (J) H = -223375.49 (J) S = 44.29 (J/K) V = 7.10 (cc) Cp = 22.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.32 | 0.35 | 12.72 | 0.15 | 0.00 | 0.48 | 0.59 | 0.17 | 0.00 | 0.00 | 1.88 | 3.82 | 4.90 | 0.64 | 5.99 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.32 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -193692.50 (J) H = -164354.81 (J) S = 27.34 (J/K) V = 3.65 (cc) Cp = 15.48 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.04 | 16.64 | 27.33 |

orthopyroxene mass = 3.51 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.84Mg1.07Fe'''0.01Ti0.00Al0.09Si1.95O6
G = -47061.24 (J) H = -39597.71 (J) S = 6.95 (J/K) V = 1.00 (cc) Cp = 4.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.28 | 96.28 | 84.00 | 3.72 | -3.53 | 4.35 | 0.45 |

clinopyroxene mass = 7.08 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.82Fe"0.28Mg0.63Fe'''0.04Ti0.05Al0.23Si1.87O6
G = -104360.75 (J) H = -89458.61 (J) S = 13.89 (J/K) V = 2.11 (cc) Cp = 7.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.61 | 8.86 | 27.82 | 9.61 | 0.19 | 3.33 | 9.58 |

clinopyroxene mass = 2.16 (gm) density = 3.55 (gm/cc) (analysis in mole %)

cpx Na0.09Ca0.89Fe"0.23Mg0.36Fe'"0.04Ti0.39Al0.72Si1.27O6
G = -31520.44 (J) H = -27104.53 (J) S = 4.11 (J/K) V = 0.61 (cc) Cp = 2.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.82 | 2.00 | 23.40 | 68.92 | 9.57 | -5.96 | 8.90 |

feldspar mass = 36.08 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.15Al1.15Si2.85O8
G = -579724.65 (J) H = -496710.23 (J) S = 77.36 (J/K) V = 13.86 (cc) Cp = 43.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.39 | 15.48 | 12.12 |

feldspar mass = 0.72 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -11217.44 (J) H = -9594.65 (J) S = 1.51 (J/K) V = 0.28 (cc) Cp = 0.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.89 | 1.85 | 64.26 |

quartz mass = 18.75 (gm) density = 2.56 (gm/cc)
SiO2
G = -303538.80 (J) H = -262958.53 (J) S = 37.81 (J/K) V = 7.32 (cc) Cp = 21.85 (J/K)

rhm-oxide mass = 0.35 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.70Mg0.13Fe'"0.11Al0.09Ti0.90O3
G = -3446.45 (J) H = -2764.07 (J) S = 0.64 (J/K) V = 0.08 (cc) Cp = 0.32 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.86 | 5.43 | 70.38 | 6.60 | 4.73 |

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1831.37 (J) H = -1555.31 (J) S = 0.26 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 83.09 (gm) density = 2.87 (gm/cc)
G = -1276393.63 (J) H = -1094098.47 (J) S = 169.87 (J/K) V = 28.95 (cc) Cp = 96.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.77 (gm/cc)
G = -1547293.77 (J) H = -1317473.96 (J) S = 214.15 (J/K) V = 36.04 (cc) Cp = 119.52 (J/K)

Oxygen delta moles = -0.00240843 delta grams = -0.0770669
G = 575.06 (J) H = -60.84 (J) S = -0.59 (J/K) V = -214.89 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 15.32 (gm) density = 2.36 (gm/cc) viscosity = 4.64 (log 10 poise) (analysis in wt %)
G = -246608.90 (J) H = -203304.33 (J) S = 40.73 (J/K) V = 6.49 (cc) Cp = 20.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

67.80 0.30 12.46 0.15 0.00 0.47 0.71 0.16 0.00 0.00 1.91 4.14 4.63 0.70 6.58 0.00 0.00 0.00 0.00

garnet mass = 14.78 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.56Mg0.27)3Al2Si3O12
G = -199507.79 (J) H = -169673.11 (J) S = 28.06 (J/K) V = 3.76 (cc) Cp = 15.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.23 | 16.55 | 27.22 |

orthopyroxene mass = 3.54 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.84Mg1.08Fe'"0.01Ti0.00Al0.08Si1.96O6
G = -47412.45 (J) H = -39997.90 (J) S = 6.97 (J/K) V = 1.01 (cc) Cp = 4.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.94 | 96.39 | 83.73 | 3.60 | -3.42 | 4.19 | 0.46 |

clinopyroxene mass = 6.12 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.82Fe"0.27Mg0.64Fe'"0.03Ti0.05Al0.22Si1.87O6
G = -90231.59 (J) H = -77538.89 (J) S = 11.94 (J/K) V = 1.82 (cc) Cp = 6.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 41.71 | 8.57 | 27.20 | 9.31 | 0.31 | 3.08 | 9.83 |

clinopyroxene mass = 3.40 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.23Mg0.36Fe'"0.03Ti0.39Al0.72Si1.27O6
G = -49691.45 (J) H = -42829.40 (J) S = 6.45 (J/K) V = 0.96 (cc) Cp = 3.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.82 | 1.90 | 23.13 | 69.20 | 9.79 | -6.36 | 9.16 |

feldspar mass = 35.08 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -563008.90 (J) H = -483436.80 (J) S = 74.85 (J/K) V = 13.48 (cc) Cp = 42.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.26 | 14.87 | 11.87 |

feldspar mass = 2.06 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.02Al1.02Si2.98O8
G = -32145.47 (J) H = -27556.56 (J) S = 4.32 (J/K) V = 0.81 (cc) Cp = 2.44 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.57 | 1.68 | 64.75 |

quartz mass = 19.43 (gm) density = 2.56 (gm/cc)
SiO2
G = -314035.45 (J) H = -272616.46 (J) S = 38.96 (J/K) V = 7.59 (cc) Cp = 22.60 (J/K)

rhm-oxide mass = 0.06 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.70Mg0.13Fe'"0.11Al0.09Ti0.90O3
G = -623.32 (J) H = -501.40 (J) S = 0.11 (J/K) V = 0.01 (cc) Cp = 0.06 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.88 | 5.33 | 70.10 | 7.09 | 4.60 |

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1859.44 (J) H = -1582.80 (J) S = 0.26 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 84.60 (gm) density = 2.87 (gm/cc)

G = -1298515.86 (J)  H = -1115733.32 (J)  S = 171.93 (J/K)  V = 29.48 (cc)  Cp = 98.41 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.78 (gm/cc)
G = -1545124.76 (J)  H = -1319037.65 (J)  S = 212.66 (J/K)  V = 35.97 (cc)  Cp = 119.29 (J/K)

Oxygen  delta moles = -0.00247518  delta grams = -0.0792026
G = 584.91 (J)  H = -61.65 (J)  S = -0.61 (J/K)  V = -218.79 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 780.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = -0.23  COH = 0.92  IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 12.72 (gm)  density = 2.35 (gm/cc)  viscosity = 4.32 (log 10 poise)  (analysis in wt %)
G = -204892.29 (J)  H = -168778.48 (J)  S = 34.29 (J/K)  V = 5.42 (cc)  Cp = 17.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.28 | 0.25 | 12.00 | 0.16 | 0.00 | 0.49 | 0.73 | 0.15 | 0.00 | 0.00 | 1.95 | 4.62 | 4.32 | 0.76 | 7.30 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 17.07 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -229151.64 (J)  H = -195253.75 (J)  S = 32.19 (J/K)  V = 4.33 (cc)  Cp = 18.36 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.41 | 16.82 | 25.77 |

clinopyroxene  mass = 7.91 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.82Fe"0.28Mg0.62Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -116282.08 (J)  H = -100113.20 (J)  S = 15.35 (J/K)  V = 2.35 (cc)  Cp = 8.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 41.05 | 8.16 | 28.07 | 8.98 | 0.63 | 2.87 | 10.23 |

clinopyroxene  mass = 1.52 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.24Mg0.35Fe'"0.03Ti0.40Al0.72Si1.28O6
G = -22189.72 (J)  H = -19161.15 (J)  S = 2.88 (J/K)  V = 0.43 (cc)  Cp = 1.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.67 | 1.78 | 24.02 | 68.89 | 10.19 | -6.73 | 9.52 |

biotite  mass = 1.83 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -28997.72 (J)  H = -24799.75 (J)  S = 3.99 (J/K)  V = 0.66 (cc)  Cp = 2.31 (J/K)

| annite | phlogopite |
|---|---|
| 3.09 | 96.91 |

feldspar  mass = 35.26 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.12Na0.74Ca0.14Al1.14Si2.86O8
G = -565169.72 (J)  H = -486338.15 (J)  S = 74.85 (J/K)  V = 13.55 (cc)  Cp = 42.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.20 | 14.11 | 11.68 |

feldspar mass = 1.72 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -26808.55 (J) H = -23032.70 (J) S = 3.59 (J/K) V = 0.68 (cc) Cp = 2.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.35 | 1.52 | 65.13 |

quartz mass = 21.18 (gm) density = 2.56 (gm/cc)
SiO2
G = -341942.15 (J) H = -297456.44 (J) S = 42.24 (J/K) V = 8.27 (cc) Cp = 24.61 (J/K)

rhm-oxide mass = 0.55 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.72Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -5405.95 (J) H = -4357.92 (J) S = 1.00 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.07 | 5.36 | 71.50 | 6.71 | 4.36 |

apatite mass = 0.15 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2200.46 (J) H = -1877.40 (J) S = 0.31 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

Total solids mass = 87.20 (gm) density = 2.86 (gm/cc)
G = -1338148.00 (J) H = -1152390.46 (J) S = 176.38 (J/K) V = 30.44 (cc) Cp = 101.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.79 (gm/cc)
G = -1543040.28 (J) H = -1321168.95 (J) S = 210.67 (J/K) V = 35.87 (cc) Cp = 118.84 (J/K)

Oxygen delta moles = -0.00241429 delta grams = -0.0772543
G = 564.60 (J) H = -59.29 (J) S = -0.59 (J/K) V = -211.40 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f6i2m2

T = 770.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.24 COH = 0.88 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 11.02 (gm) density = 2.33 (gm/cc) viscosity = 3.91 (log 10 poise) (analysis in wt %)
G = -177473.31 (J) H = -145968.86 (J) S = 30.20 (J/K) V = 4.72 (cc) Cp = 15.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.34 | 0.20 | 11.56 | 0.17 | 0.00 | 0.51 | 0.95 | 0.13 | 0.00 | 0.00 | 2.05 | 5.10 | 3.96 | 0.86 | 8.17 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 17.23 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -229977.20 (J) H = -196336.00 (J) S = 32.25 (J/K) V = 4.36 (cc) Cp = 18.46 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.55 | 17.29 | 24.16 |

clinopyroxene mass = 6.43 (gm) density = 3.37 (gm/cc) (analysis in mole %)

cpx Na0.11Ca0.82Fe"0.29Mg0.60Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -94139.78 (J) H = -81200.02 (J) S = 12.40 (J/K) V = 1.91 (cc) Cp = 7.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.33 | 7.67 | 29.04 | 8.69 | 0.89 | 2.76 | 10.62 |

clinopyroxene mass = 3.09 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.25Mg0.34Fe'"0.03Ti0.40Al0.71Si1.28O6
G = -44795.40 (J) H = -38752.90 (J) S = 5.79 (J/K) V = 0.87 (cc) Cp = 3.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.65 | 1.63 | 25.03 | 68.69 | 10.50 | -7.01 | 9.80 |

biotite mass = 2.48 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -39226.29 (J) H = -33616.25 (J) S = 5.38 (J/K) V = 0.90 (cc) Cp = 3.13 (J/K)

| annite | phlogopite |
|---|---|
| 3.60 | 96.40 |

feldspar mass = 34.87 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.75Ca0.14Al1.14Si2.86O8
G = -558293.35 (J) H = -481468.59 (J) S = 73.65 (J/K) V = 13.41 (cc) Cp = 42.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.02 | 13.59 | 11.39 |

feldspar mass = 2.29 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.66Na0.33Ca0.01Al1.01Si2.99O8
G = -35603.62 (J) H = -30657.24 (J) S = 4.74 (J/K) V = 0.90 (cc) Cp = 2.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.89 | 1.38 | 65.74 |

quartz mass = 22.15 (gm) density = 2.56 (gm/cc)
SiO2
G = -357279.57 (J) H = -311439.17 (J) S = 43.94 (J/K) V = 8.65 (cc) Cp = 25.72 (J/K)

rhm-oxide mass = 0.19 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.72Mg0.11Fe'"0.11Al0.08Ti0.90O3
G = -1856.84 (J) H = -1500.06 (J) S = 0.34 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.28 | 5.43 | 71.82 | 7.29 | 4.18 |

apatite mass = 0.16 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2265.94 (J) H = -1937.72 (J) S = 0.31 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

Total solids mass = 88.90 (gm) density = 2.86 (gm/cc)
G = -1363438.00 (J) H = -1176907.96 (J) S = 178.81 (J/K) V = 31.08 (cc) Cp = 103.48 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.79 (gm/cc)
G = -1540911.32 (J) H = -1322876.82 (J) S = 209.02 (J/K) V = 35.81 (cc) Cp = 118.68 (J/K)

Oxygen delta moles = -0.00247275 delta grams = -0.0791252
G = 572.21 (J) H = -59.86 (J) S = -0.61 (J/K) V = -214.46 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 760.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -14.77  delta HM = -5.17  NNO = 0.00  QFM = -0.25  COH = 0.84
IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid  mass = 9.49 (gm)  density = 2.32 (gm/cc)  viscosity = 3.47 (log 10 poise)  (analysis in wt %)
G = -152910.84 (J)  H = -125492.67 (J)  S = 26.54 (J/K)  V = 4.10 (cc)  Cp = 13.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.03 | 0.16 | 11.18 | 0.18 | 0.00 | 0.52 | 1.17 | 0.12 | 0.00 | 0.00 | 2.20 | 5.58 | 3.59 | 1.00 | 9.26 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 17.30 (gm)  density = 3.95 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.59Mg0.23)3Al2Si3O12
G = -229890.85 (J)  H = -196672.31 (J)  S = 32.15 (J/K)  V = 4.37 (cc)  Cp = 18.47 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.33 | 17.90 | 22.78 |

clinopyroxene  mass = 5.51 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.11Ca0.82Fe"0.30Mg0.59Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -80335.34 (J)  H = -69433.26 (J)  S = 10.55 (J/K)  V = 1.63 (cc)  Cp = 6.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.14 | 7.13 | 29.62 | 8.46 | 0.98 | 2.74 | 10.93 |

clinopyroxene  mass = 3.95 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.33Fe'"0.03Ti0.40Al0.72Si1.28O6
G = -57063.72 (J)  H = -49463.99 (J)  S = 7.36 (J/K)  V = 1.11 (cc)  Cp = 4.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.51 | 1.48 | 25.78 | 68.83 | 10.63 | -7.18 | 9.95 |

biotite  mass = 3.00 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -47298.44 (J)  H = -40618.71 (J)  S = 6.47 (J/K)  V = 1.08 (cc)  Cp = 3.77 (J/K)

| annite | phlogopite |
|---|---|
| 4.01 | 95.99 |

feldspar  mass = 34.72 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.11Na0.76Ca0.13Al1.13Si2.87O8
G = -555185.28 (J)  H = -479847.90 (J)  S = 72.92 (J/K)  V = 13.34 (cc)  Cp = 42.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.66 | 13.38 | 10.96 |

feldspar  mass = 2.84 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -44138.49 (J)  H = -38091.33 (J)  S = 5.85 (J/K)  V = 1.12 (cc)  Cp = 3.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.13 | 1.25 | 66.61 |

quartz  mass = 22.95 (gm)  density = 2.60 (gm/cc)
SiO2
G = -369724.48 (J)  H = -323549.67 (J)  S = 44.69 (J/K)  V = 8.83 (cc)  Cp = 30.93 (J/K)

apatite mass = 0.16 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2256.64 (J) H = -1934.18 (J) S = 0.31 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

Total solids mass = 90.43 (gm) density = 2.87 (gm/cc)
G = -1385893.25 (J) H = -1199611.35 (J) S = 180.30 (J/K) V = 31.53 (cc) Cp = 109.72 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.80 (gm/cc)
G = -1538804.09 (J) H = -1325104.01 (J) S = 206.84 (J/K) V = 35.63 (cc) Cp = 122.92 (J/K)

Oxygen delta moles = -0.00251657 delta grams = -0.0805273
G = 576.18 (J) H = -60.04 (J) S = -0.62 (J/K) V = -216.17 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 7.93 (gm) density = 2.29 (gm/cc) viscosity = 2.90 (log 10 poise) (analysis in wt %)
G = -128032.14 (J) H = -104656.71 (J) S = 22.85 (J/K) V = 3.46 (cc) Cp = 11.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.88 | 0.11 | 10.88 | 0.19 | 0.00 | 0.53 | 1.40 | 0.10 | 0.00 | 0.00 | 2.47 | 6.17 | 3.17 | 1.23 | 10.85 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 17.30 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.22)3Al2Si3O12
G = -229259.79 (J) H = -196578.46 (J) S = 31.94 (J/K) V = 4.37 (cc) Cp = 18.43 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.70 | 18.79 | 21.51 |

clinopyroxene mass = 5.11 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.82Fe"0.30Mg0.58Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -74412.16 (J) H = -64455.78 (J) S = 9.73 (J/K) V = 1.51 (cc) Cp = 5.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.57 | 6.50 | 29.75 | 8.30 | 0.83 | 2.88 | 11.17 |

clinopyroxene mass = 4.04 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.32Fe'"0.03Ti0.40Al0.72Si1.27O6
G = -58239.42 (J) H = -50589.75 (J) S = 7.48 (J/K) V = 1.13 (cc) Cp = 4.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.28 | 1.32 | 26.27 | 69.42 | 10.54 | -7.18 | 9.91 |

biotite mass = 3.42 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -53825.84 (J) H = -46323.56 (J) S = 7.33 (J/K) V = 1.23 (cc) Cp = 4.30 (J/K)

| annite | phlogopite |
|---|---|
| 4.31 | 95.69 |

feldspar mass = 34.82 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.76Ca0.14Al1.14Si2.86O8
G = -556331.55 (J) H = -481922.43 (J) S = 72.73 (J/K) V = 13.37 (cc) Cp = 43.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.05 | 13.57 | 10.37 |

feldspar mass = 3.45 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -53419.48 (J) H = -46204.19 (J) S = 7.05 (J/K) V = 1.35 (cc) Cp = 4.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.04 | 1.15 | 67.80 |

quartz mass = 23.69 (gm) density = 2.60 (gm/cc)
SiO2
G = -381043.50 (J) H = -334175.03 (J) S = 45.81 (J/K) V = 9.10 (cc) Cp = 31.64 (J/K)

apatite mass = 0.15 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2167.20 (J) H = -1861.76 (J) S = 0.30 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

Total solids mass = 91.99 (gm) density = 2.86 (gm/cc)
G = -1408698.95 (J) H = -1222110.96 (J) S = 182.37 (J/K) V = 32.12 (cc) Cp = 111.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.81 (gm/cc)
G = -1536731.09 (J) H = -1326767.67 (J) S = 205.21 (J/K) V = 35.58 (cc) Cp = 122.86 (J/K)

Oxygen delta moles = -0.00254092 delta grams = -0.0813065
G = 575.55 (J) H = -59.73 (J) S = -0.62 (J/K) V = -216.15 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 740.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.28 COH = 0.76 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 6.31 (gm) density = 2.25 (gm/cc) viscosity = 2.10 (log 10 poise) (analysis in wt %)
G = -102164.79 (J) H = -82888.56 (J) S = 19.03 (J/K) V = 2.80 (cc) Cp = 9.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.21 | 0.07 | 10.43 | 0.21 | 0.00 | 0.56 | 1.76 | 0.09 | 0.00 | 0.00 | 2.97 | 7.04 | 2.60 | 1.67 | 13.40 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 17.33 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.20Fe"0.60Mg0.20)3Al2Si3O12
G = -228983.83 (J) H = -196794.84 (J) S = 31.77 (J/K) V = 4.38 (cc) Cp = 18.40 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.97 | 19.67 | 20.36 |

clinopyroxene mass = 4.75 (gm) density = 3.38 (gm/cc) (analysis in mole %)

cpx Na0.11Ca0.83Fe"0.30Mg0.57Fe'"0.04Ti0.04Al0.23Si1.88O6
G = -69127.92 (J) H = -60010.98 (J) S = 9.00 (J/K) V = 1.41 (cc) Cp = 5.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.98 | 5.94 | 29.83 | 8.13 | 0.66 | 3.03 | 11.42 |

clinopyroxene mass = 4.11 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.27Mg0.32Fe'"0.03Ti0.40Al0.73Si1.27O6
G = -59135.41 (J) H = -51477.09 (J) S = 7.56 (J/K) V = 1.15 (cc) Cp = 4.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.03 | 1.17 | 26.71 | 70.02 | 10.45 | -7.21 | 9.89 |

biotite mass = 3.80 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -59621.53 (J) H = -51422.16 (J) S = 8.09 (J/K) V = 1.37 (cc) Cp = 4.77 (J/K)

| annite | phlogopite |
|---|---|
| 4.58 | 95.42 |

feldspar mass = 35.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.76Ca0.14Al1.14Si2.86O8
G = -558731.49 (J) H = -485089.14 (J) S = 72.69 (J/K) V = 13.44 (cc) Cp = 43.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.45 | 13.72 | 9.83 |

feldspar mass = 4.03 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -62254.53 (J) H = -53966.40 (J) S = 8.18 (J/K) V = 1.58 (cc) Cp = 4.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.01 | 1.06 | 68.93 |

quartz mass = 24.44 (gm) density = 2.61 (gm/cc)
SiO2
G = -392754.11 (J) H = -345183.54 (J) S = 46.95 (J/K) V = 9.37 (cc) Cp = 32.38 (J/K)

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1901.04 (J) H = -1636.82 (J) S = 0.26 (J/K) V = 0.04 (cc) Cp = 0.15 (J/K)

Total solids mass = 93.61 (gm) density = 2.86 (gm/cc)
G = -1432509.85 (J) H = -1245580.99 (J) S = 184.50 (J/K) V = 32.73 (cc) Cp = 113.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.81 (gm/cc)
G = -1534674.64 (J) H = -1328469.55 (J) S = 203.53 (J/K) V = 35.54 (cc) Cp = 122.92 (J/K)

Oxygen delta moles = -0.00256531 delta grams = -0.0820867
G = 574.80 (J) H = -59.41 (J) S = -0.63 (J/K) V = -216.09 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 730.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.29 COH = 0.72
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 4.87 (gm) density = 2.20 (gm/cc) viscosity = 1.16 (log 10 poise) (analysis in wt %)
G = -79283.12 (J) H = -63617.00 (J) S = 15.62 (J/K) V = 2.22 (cc) Cp = 7.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.56 | 0.04 | 9.71 | 0.23 | 0.00 | 0.58 | 2.28 | 0.07 | 0.00 | 0.00 | 3.91 | 8.10 | 1.97 | 2.50 | 17.06 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 17.37 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.21Fe"0.60Mg0.19)3Al2Si3O12
G = -228869.23 (J) H = -197153.53 (J) S = 31.62 (J/K) V = 4.38 (cc) Cp = 18.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.17 | 20.52 | 19.31 |

clinopyroxene mass = 4.46 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.12Ca0.83Fe"0.30Mg0.57Fe'"0.04Ti0.04Al0.23Si1.88O6
G = -64713.37 (J) H = -56302.86 (J) S = 8.38 (J/K) V = 1.32 (cc) Cp = 4.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 41.37 | 5.46 | 29.87 | 7.94 | 0.51 | 3.15 | 11.69 |

clinopyroxene mass = 4.16 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.27Mg0.31Fe'"0.03Ti0.40Al0.73Si1.26O6
G = -59705.39 (J) H = -52083.76 (J) S = 7.60 (J/K) V = 1.16 (cc) Cp = 4.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.75 | 1.05 | 27.09 | 70.60 | 10.39 | -7.26 | 9.88 |

biotite mass = 4.13 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -64670.92 (J) H = -55898.11 (J) S = 8.75 (J/K) V = 1.49 (cc) Cp = 5.17 (J/K)

| annite | phlogopite |
|---|---|
| 4.82 | 95.18 |

feldspar mass = 35.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.77Ca0.14Al1.14Si2.86O8
G = -562522.80 (J) H = -489475.17 (J) S = 72.82 (J/K) V = 13.54 (cc) Cp = 44.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.87 | 13.79 | 9.35 |

feldspar mass = 4.44 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -68521.70 (J) H = -59531.83 (J) S = 8.96 (J/K) V = 1.74 (cc) Cp = 5.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.04 | 0.97 | 69.99 |

quartz mass = 25.11 (gm) density = 2.61 (gm/cc)
SiO2
G = -403004.28 (J) H = -354945.94 (J) S = 47.91 (J/K) V = 9.62 (cc) Cp = 32.99 (J/K)

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1344.88 (J) H = -1160.59 (J) S = 0.18 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 95.04 (gm) density = 2.86 (gm/cc)

G = -1453352.57 (J)  H = -1266551.79 (J)  S = 186.21 (J/K)  V = 33.27 (cc)  Cp = 115.88 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.82 (gm/cc)
G = -1532635.69 (J)  H = -1330168.79 (J)  S = 201.83 (J/K)  V = 35.49 (cc)  Cp = 123.16 (J/K)

Oxygen  delta moles = -0.00258881  delta grams = -0.0828387
G = 573.76 (J)  H = -59.05 (J)  S = -0.63 (J/K)  V = -215.92 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 720.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -15.74  delta HM = -5.21  NNO = 0.00  QFM = -0.31  COH = 0.68  IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid  mass = 4.06 (gm)  density = 2.16 (gm/cc)  viscosity = 0.50 (log 10 poise)  (analysis in wt %)
G = -66179.24 (J)  H = -52676.52 (J)  S = 13.60 (J/K)  V = 1.88 (cc)  Cp = 6.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48.32 | 0.03 | 8.96 | 0.23 | 0.00 | 0.55 | 2.74 | 0.06 | 0.00 | 0.00 | 5.03 | 8.83 | 1.55 | 3.50 | 20.21 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 17.40 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.21Fe"0.60Mg0.18)3Al2Si3O12
G = -228820.36 (J)  H = -197571.31 (J)  S = 31.46 (J/K)  V = 4.39 (cc)  Cp = 18.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.33 | 21.31 | 18.36 |

clinopyroxene  mass = 4.21 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.12Ca0.83Fe"0.30Mg0.56Fe'"0.04Ti0.04Al0.23Si1.89O6
G = -61084.04 (J)  H = -53262.83 (J)  S = 7.88 (J/K)  V = 1.25 (cc)  Cp = 4.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 41.75 | 5.05 | 29.87 | 7.73 | 0.37 | 3.25 | 11.99 |

clinopyroxene  mass = 4.19 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.27Mg0.30Fe'"0.03Ti0.41Al0.74Si1.26O6
G = -59994.59 (J)  H = -52447.41 (J)  S = 7.60 (J/K)  V = 1.17 (cc)  Cp = 4.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.43 | 0.94 | 27.43 | 71.15 | 10.36 | -7.35 | 9.91 |

biotite  mass = 4.42 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -69024.63 (J)  H = -59791.42 (J)  S = 9.30 (J/K)  V = 1.59 (cc)  Cp = 5.52 (J/K)

| annite | phlogopite |
|---|---|
| 5.02 | 94.98 |

feldspar  mass = 35.49 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.77Ca0.14Al1.14Si2.86O8
G = -565257.51 (J)  H = -492955.54 (J)  S = 72.80 (J/K)  V = 13.61 (cc)  Cp = 45.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 77.32 | 13.78 | 8.90 |

feldspar mass = 4.59 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -70694.79 (J) H = -61556.67 (J) S = 9.20 (J/K) V = 1.80 (cc) Cp = 5.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.15 | 0.89 | 70.97 |

quartz mass = 25.51 (gm) density = 2.61 (gm/cc)
SiO2
G = -408903.28 (J) H = -360902.40 (J) S = 48.33 (J/K) V = 9.75 (cc) Cp = 33.24 (J/K)

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -655.70 (J) H = -567.12 (J) S = 0.09 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

Total solids mass = 95.86 (gm) density = 2.86 (gm/cc)
G = -1464434.90 (J) H = -1279054.69 (J) S = 186.66 (J/K) V = 33.57 (cc) Cp = 117.35 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.82 (gm/cc)
G = -1530614.14 (J) H = -1331731.21 (J) S = 200.25 (J/K) V = 35.45 (cc) Cp = 123.60 (J/K)

Oxygen delta moles = -0.00261042 delta grams = -0.0835302
G = 572.19 (J) H = -58.64 (J) S = -0.64 (J/K) V = -215.55 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 710.00 (C) P = 8.000 (kbars) log(10) f O2 = -16.00 delta HM = -5.22 NNO = 0.00 QFM = -0.32 COH = 0.64 IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid mass = 3.61 (gm) density = 2.13 (gm/cc) viscosity = 0.08 (log 10 poise) (analysis in wt %)
G = -58855.36 (J) H = -46652.63 (J) S = 12.41 (J/K) V = 1.69 (cc) Cp = 5.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 44.26 | 0.02 | 8.29 | 0.22 | 0.00 | 0.51 | 3.08 | 0.05 | 0.00 | 0.00 | 6.12 | 9.22 | 1.30 | 4.48 | 22.46 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 17.45 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.22Fe"0.60Mg0.17)3Al2Si3O12
G = -228962.78 (J) H = -198157.98 (J) S = 31.33 (J/K) V = 4.40 (cc) Cp = 18.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.43 | 22.09 | 17.49 |

clinopyroxene mass = 3.99 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.12Ca0.83Fe"0.30Mg0.55Fe'"0.04Ti0.04Al0.23Si1.89O6
G = -57777.24 (J) H = -50491.16 (J) S = 7.41 (J/K) V = 1.18 (cc) Cp = 4.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.14 | 4.67 | 29.82 | 7.51 | 0.22 | 3.34 | 12.29 |

clinopyroxene mass = 4.21 (gm) density = 3.59 (gm/cc) (analysis in mole %)

cpx Na0.10Ca0.89Fe"0.28Mg0.30Fe'"0.03Ti0.41Al0.74Si1.25O6
G = -60161.66 (J) H = -52705.53 (J) S = 7.58 (J/K) V = 1.17 (cc) Cp = 4.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.08 | 0.84 | 27.73 | 71.69 | 10.34 | -7.46 | 9.94 |

biotite mass = 4.68 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -72926.89 (J) H = -63310.28 (J) S = 9.78 (J/K) V = 1.68 (cc) Cp = 5.84 (J/K)

| annite | phlogopite |
|---|---|
| 5.18 | 94.82 |

feldspar mass = 35.61 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.78Ca0.14Al1.14Si2.86O8
G = -566496.65 (J) H = -495143.87 (J) S = 72.58 (J/K) V = 13.65 (cc) Cp = 46.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 77.79 | 13.72 | 8.49 |

feldspar mass = 4.63 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -71122.55 (J) H = -62066.91 (J) S = 9.21 (J/K) V = 1.81 (cc) Cp = 5.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.28 | 0.81 | 71.91 |

quartz mass = 25.75 (gm) density = 2.62 (gm/cc)
SiO2
G = -412305.41 (J) H = -364668.55 (J) S = 48.45 (J/K) V = 9.83 (cc) Cp = 33.29 (J/K)

Total solids mass = 96.31 (gm) density = 2.86 (gm/cc)
G = -1469753.19 (J) H = -1286544.28 (J) S = 186.35 (J/K) V = 33.73 (cc) Cp = 118.50 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.82 (gm/cc)
G = -1528608.55 (J) H = -1333196.91 (J) S = 198.76 (J/K) V = 35.42 (cc) Cp = 124.17 (J/K)

Oxygen delta moles = -0.00263078 delta grams = -0.084182
G = 570.26 (J) H = -58.18 (J) S = -0.64 (J/K) V = -215.05 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: f6i2m2

T = 700.00 (C) P = 8.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = -0.34 COH = 0.60 IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 3.29 (gm) density = 2.11 (gm/cc) viscosity = -0.18 (log 10 poise) (analysis in wt %)
G = -53733.51 (J) H = -42479.16 (J) S = 11.56 (J/K) V = 1.56 (cc) Cp = 5.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 41.60 | 0.01 | 7.83 | 0.21 | 0.00 | 0.46 | 3.38 | 0.04 | 0.00 | 0.00 | 6.58 | 9.56 | 1.13 | 4.91 | 24.30 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 17.52 (gm) density = 3.97 (gm/cc) (analysis in mole %)

(Ca0.23Fe"0.60Mg0.17)3Al2Si3O12
G = -229375.78 (J) H = -198983.70 (J) S = 31.23 (J/K) V = 4.41 (cc) Cp = 18.42 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.47 | 22.87 | 16.66 |

clinopyroxene mass = 3.75 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.13Ca0.83Fe"0.30Mg0.55Fe'"0.04Ti0.04Al0.23Si1.89O6
G = -54320.30 (J) H = -47575.34 (J) S = 6.93 (J/K) V = 1.11 (cc) Cp = 4.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.52 | 4.33 | 29.74 | 7.29 | 0.07 | 3.44 | 12.61 |

clinopyroxene mass = 4.22 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.28Mg0.29Fe'"0.03Ti0.41Al0.75Si1.25O6
G = -60294.26 (J) H = -52934.05 (J) S = 7.56 (J/K) V = 1.18 (cc) Cp = 4.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.72 | 0.75 | 28.00 | 72.23 | 10.33 | -7.57 | 9.97 |

biotite mass = 4.93 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -76676.50 (J) H = -66711.61 (J) S = 10.24 (J/K) V = 1.77 (cc) Cp = 6.14 (J/K)

| annite | phlogopite |
|---|---|
| 5.33 | 94.67 |

feldspar mass = 35.65 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.78Ca0.14Al1.14Si2.86O8
G = -566613.92 (J) H = -496360.01 (J) S = 72.19 (J/K) V = 13.66 (cc) Cp = 47.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 78.25 | 13.65 | 8.10 |

feldspar mass = 4.62 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.73Na0.26Ca0.01Al1.01Si2.99O8
G = -70872.25 (J) H = -61985.86 (J) S = 9.13 (J/K) V = 1.81 (cc) Cp = 5.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.44 | 0.74 | 72.82 |

quartz mass = 25.93 (gm) density = 2.62 (gm/cc)
SiO2
G = -414731.25 (J) H = -367578.16 (J) S = 48.45 (J/K) V = 9.89 (cc) Cp = 33.27 (J/K)

Total solids mass = 96.62 (gm) density = 2.86 (gm/cc)
G = -1472884.25 (J) H = -1292128.72 (J) S = 185.74 (J/K) V = 33.83 (cc) Cp = 119.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.82 (gm/cc)
G = -1526617.76 (J) H = -1334607.89 (J) S = 197.31 (J/K) V = 35.39 (cc) Cp = 124.61 (J/K)

Oxygen delta moles = -0.00265099 delta grams = -0.0848285
G = 568.20 (J) H = -57.71 (J) S = -0.64 (J/K) V = -214.49 (cc)

**********----------**********
Title: f8a2

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.26 (log 10 poise)  (analysis in wt %)
G = -1709058.73 (J)  H = -1265367.50 (J)  S = 282.04 (J/K)  V = 41.56 (cc)  Cp = 142.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.65 | 0.00 | 3.01 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.26 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1709058.73 (J)  H = -1265367.50 (J)  S = 282.04 (J/K)  V = 41.56 (cc)  Cp = 142.60 (J/K)

Oxygen  delta moles = 2.15106e-16  delta grams = 6.88312e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.32 (log 10 poise)  (analysis in wt %)
G = -1706244.32 (J)  H = -1266794.65 (J)  S = 281.13 (J/K)  V = 41.54 (cc)  Cp = 142.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.65 | 0.00 | 3.01 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.32 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1706244.32 (J)  H = -1266794.65 (J)  S = 281.13 (J/K)  V = 41.54 (cc)  Cp = 142.59 (J/K)

Oxygen  delta moles = 2.65574e-06  delta grams = 8.49803e-05
G = -0.96 (J)  H = 0.11 (J)  S = 0.00 (J/K)  V = 0.35 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.38 (log 10 poise)  (analysis in wt %)
G = -1703439.17 (J)  H = -1268221.86 (J)  S = 280.22 (J/K)  V = 41.51 (cc)  Cp = 142.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.65 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.38 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1703439.17 (J)  H = -1268221.86 (J)  S = 280.22 (J/K)  V = 41.51 (cc)  Cp = 142.58 (J/K)

Oxygen  delta moles = 5.58569e-06  delta grams = 0.000178735
G = -2.01 (J)  H = 0.24 (J)  S = 0.00 (J/K)  V = 0.72 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.44 (log 10 poise)  (analysis in wt %)
G = -1700643.35 (J)  H = -1269649.13 (J)  S = 279.30 (J/K)  V = 41.48 (cc)  Cp = 142.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.65 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.44 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1700643.35 (J)  H = -1269649.13 (J)  S = 279.30 (J/K)  V = 41.48 (cc)  Cp = 142.58 (J/K)

Oxygen  delta moles = 8.79762e-06  delta grams = 0.000281513
G = -3.15 (J)  H = 0.37 (J)  S = 0.00 (J/K)  V = 1.13 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1697856.92 (J)  H = -1271076.48 (J)  S = 278.37 (J/K)  V = 41.45 (cc)  Cp = 142.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1697856.92 (J)  H = -1271076.48 (J)  S = 278.37 (J/K)  V = 41.45 (cc)  Cp = 142.57 (J/K)

Oxygen  delta moles = 1.22996e-05  delta grams = 0.000393573
G = -4.37 (J)  H = 0.51 (J)  S = 0.00 (J/K)  V = 1.57 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.56 (log 10 poise)  (analysis in wt %)
G = -1695079.95 (J)  H = -1272503.91 (J)  S = 277.44 (J/K)  V = 41.42 (cc)  Cp = 142.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1695079.95 (J)  H = -1272503.91 (J)  S = 277.44 (J/K)  V = 41.42 (cc)  Cp = 142.56 (J/K)

Oxygen  delta moles = 1.61001e-05  delta grams = 0.000515184
G = -5.67 (J)  H = 0.67 (J)  S = 0.00 (J/K)  V = 2.04 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.63 (log 10 poise) (analysis in wt %)
G = -1692312.50 (J) H = -1273931.43 (J) S = 276.50 (J/K) V = 41.39 (cc) Cp = 142.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.63 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1692312.50 (J) H = -1273931.43 (J) S = 276.50 (J/K) V = 41.39 (cc) Cp = 142.56 (J/K)

Oxygen delta moles = 2.02078e-05 delta grams = 0.000646627
G = -7.07 (J) H = 0.83 (J) S = 0.01 (J/K) V = 2.54 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -1689554.64 (J) H = -1275359.04 (J) S = 275.55 (J/K) V = 41.36 (cc) Cp = 142.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.69 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1689554.64 (J) H = -1275359.04 (J) S = 275.55 (J/K) V = 41.36 (cc) Cp = 142.55 (J/K)

Oxygen delta moles = 2.4632e-05 delta grams = 0.000788195
G = -8.55 (J) H = 1.00 (J) S = 0.01 (J/K) V = 3.08 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1220.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.37 COH = 2.39 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1686806.43 (J) H = -1276786.75 (J) S = 274.60 (J/K) V = 41.34 (cc) Cp = 142.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1686806.43 (J) H = -1276786.75 (J) S = 274.60 (J/K) V = 41.34 (cc) Cp = 142.55 (J/K)

Oxygen delta moles = 2.93822e-05 delta grams = 0.000940195
G = -10.13 (J) H = 1.19 (J) S = 0.01 (J/K) V = 3.65 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1210.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.37 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1684067.94 (J) H = -1278214.56 (J) S = 273.64 (J/K) V = 41.31 (cc) Cp = 142.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1684067.94 (J) H = -1278214.56 (J) S = 273.64 (J/K) V = 41.31 (cc) Cp = 142.54 (J/K)

Oxygen delta moles = 3.44683e-05 delta grams = 0.00110294
G = -11.79 (J) H = 1.38 (J) S = 0.01 (J/K) V = 4.25 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1200.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.35 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.89 (log 10 poise) (analysis in wt %)
G = -1681339.12 (J) H = -1279588.30 (J) S = 272.72 (J/K) V = 41.28 (cc) Cp = 134.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 2.99 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.89 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1681339.12 (J) H = -1279588.30 (J) S = 272.72 (J/K) V = 41.28 (cc) Cp = 134.62 (J/K)

Oxygen delta moles = 3.99007e-05 delta grams = 0.00127678
G = -13.55 (J) H = 1.58 (J) S = 0.01 (J/K) V = 4.89 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1190.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.34 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1678619.66 (J) H = -1280937.09 (J) S = 271.80 (J/K) V = 41.25 (cc) Cp = 134.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.67 | 0.00 | 2.99 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1678619.66 (J) H = -1280937.09 (J) S = 271.80 (J/K) V = 41.25 (cc) Cp = 134.59 (J/K)

Oxygen delta moles = 4.56904e-05 delta grams = 0.00146204
G = -15.40 (J) H = 1.79 (J) S = 0.01 (J/K) V = 5.56 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1675909.58 (J) H = -1282285.81 (J) S = 270.88 (J/K) V = 41.22 (cc) Cp = 134.57 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.67 0.00 2.99 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1675909.58 (J) H = -1282285.81 (J) S = 270.88 (J/K) V = 41.22 (cc) Cp = 134.57 (J/K)

Oxygen delta moles = 5.18486e-05 delta grams = 0.00165909
G = -17.34 (J) H = 2.02 (J) S = 0.01 (J/K) V = 6.26 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1170.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.35 COH = 2.30 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1673208.96 (J) H = -1283634.44 (J) S = 269.95 (J/K) V = 41.19 (cc) Cp = 134.54 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.67 0.00 2.99 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1673208.96 (J) H = -1283634.44 (J) S = 269.95 (J/K) V = 41.19 (cc) Cp = 134.54 (J/K)

Oxygen delta moles = 5.83872e-05 delta grams = 0.00186832
G = -19.38 (J) H = 2.25 (J) S = 0.01 (J/K) V = 7.01 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1160.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.35 COH = 2.29 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1670517.87 (J) H = -1284982.99 (J) S = 269.01 (J/K) V = 41.16 (cc) Cp = 134.51 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

71.09 0.40 13.66 0.67 0.00 2.99 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1670517.87 (J) H = -1284982.99 (J) S = 269.01 (J/K) V = 41.16 (cc) Cp = 134.51 (J/K)

Oxygen delta moles = 6.53186e-05 delta grams = 0.00209012
G = -21.51 (J) H = 2.49 (J) S = 0.02 (J/K) V = 7.78 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1150.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.34 COH = 2.27 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1667836.37 (J) H = -1286331.45 (J) S = 268.07 (J/K) V = 41.14 (cc) Cp = 134.48 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.68 0.00 2.98 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1667836.37 (J) H = -1286331.45 (J) S = 268.07 (J/K) V = 41.14 (cc) Cp = 134.48 (J/K)

Oxygen delta moles = 7.26557e-05 delta grams = 0.0023249
G = -23.74 (J) H = 2.75 (J) S = 0.02 (J/K) V = 8.60 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1140.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.34 COH = 2.25 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -1665164.54 (J) H = -1287679.81 (J) S = 267.12 (J/K) V = 41.11 (cc) Cp = 134.45 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.68 0.00 2.98 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1665164.54 (J) H = -1287679.81 (J) S = 267.12 (J/K) V = 41.11 (cc) Cp = 134.45 (J/K)

Oxygen delta moles = 8.04121e-05 delta grams = 0.00257309
G = -26.07 (J) H = 3.01 (J) S = 0.02 (J/K) V = 9.45 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1130.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.33 COH = 2.23 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1662502.45 (J) H = -1289028.08 (J) S = 266.17 (J/K) V = 41.08 (cc) Cp = 134.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.68 | 0.00 | 2.98 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1662502.45 (J) H = -1289028.08 (J) S = 266.17 (J/K) V = 41.08 (cc) Cp = 134.42 (J/K)

Oxygen delta moles = 8.8602e-05 delta grams = 0.00283516
G = -28.49 (J) H = 3.28 (J) S = 0.02 (J/K) V = 10.34 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1120.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.22 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.45 (log 10 poise) (analysis in wt %)
G = -1659850.18 (J) H = -1290376.24 (J) S = 265.21 (J/K) V = 41.05 (cc) Cp = 134.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.68 | 0.00 | 2.98 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1659850.18 (J)  H = -1290376.24 (J)  S = 265.21 (J/K)  V = 41.05 (cc)  Cp = 134.38 (J/K)

Oxygen  delta moles = 9.72401e-05  delta grams = 0.00311157
G = -31.02 (J)  H = 3.57 (J)  S = 0.02 (J/K)  V = 11.26 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1110.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.20  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 5.53 (log 10 poise)  (analysis in wt %)
G = -1657207.78 (J)  H = -1291724.29 (J)  S = 264.24 (J/K)  V = 41.02 (cc)  Cp = 134.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.69 | 0.00 | 2.98 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.53 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1657207.78 (J)  H = -1291724.29 (J)  S = 264.24 (J/K)  V = 41.02 (cc)  Cp = 134.35 (J/K)

Oxygen  delta moles = 0.000106342  delta grams = 0.00340282
G = -33.66 (J)  H = 3.86 (J)  S = 0.03 (J/K)  V = 12.23 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1100.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.31  COH = 2.18  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 5.60 (log 10 poise)  (analysis in wt %)
G = -1654575.35 (J)  H = -1293072.23 (J)  S = 263.27 (J/K)  V = 41.00 (cc)  Cp = 134.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.69 | 0.00 | 2.97 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.60 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1654575.35 (J) H = -1293072.23 (J) S = 263.27 (J/K) V = 41.00 (cc) Cp = 134.31 (J/K)

Oxygen delta moles = 0.000115924 delta grams = 0.00370943
G = -36.39 (J) H = 4.17 (J) S = 0.03 (J/K) V = 13.23 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1090.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.16 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 99.79 (gm) density = 2.44 (gm/cc) viscosity = 5.69 (log 10 poise) (analysis in wt %)
G = -1648809.11 (J) H = -1292015.60 (J) S = 261.74 (J/K) V = 40.90 (cc) Cp = 133.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.13 | 0.40 | 13.69 | 0.69 | 0.00 | 2.94 | 0.10 | 1.15 | 0.00 | 0.00 | 2.40 | 4.00 | 2.40 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.21 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.60Mg1.31Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -3133.89 (J) H = -2474.18 (J) S = 0.48 (J/K) V = 0.06 (cc) Cp = 0.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.95 | 96.49 | 59.66 | 3.40 | -3.24 | 5.35 | 0.29 |

Total solids mass = 0.21 (gm) density = 3.36 (gm/cc)
G = -3133.89 (J) H = -2474.18 (J) S = 0.48 (J/K) V = 0.06 (cc) Cp = 0.26 (J/K)

Viscosity of the System: 5.70 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1651943.00 (J) H = -1294489.78 (J) S = 262.23 (J/K) V = 40.96 (cc) Cp = 134.21 (J/K)

Oxygen delta moles = 0.00010743 delta grams = 0.00343763
G = -33.45 (J) H = 3.83 (J) S = 0.03 (J/K) V = 12.18 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1080.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.30 COH = 2.14 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 99.40 (gm) density = 2.44 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -1640427.85 (J) H = -1288939.47 (J) S = 259.76 (J/K) V = 40.74 (cc) Cp = 133.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.20 | 0.40 | 13.73 | 0.68 | 0.00 | 2.88 | 0.10 | 1.06 | 0.00 | 0.00 | 2.41 | 4.02 | 2.41 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.60 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.62Mg1.29Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -8883.88 (J) H = -7024.54 (J) S = 1.37 (J/K) V = 0.18 (cc) Cp = 0.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.18 | 96.35 | 61.87 | 3.51 | -3.34 | 5.50 | 0.30 |

Total solids mass = 0.60 (gm) density = 3.37 (gm/cc)
G = -8883.88 (J) H = -7024.54 (J) S = 1.37 (J/K) V = 0.18 (cc) Cp = 0.73 (J/K)

Viscosity of the System: 5.80 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1649311.73 (J) H = -1295964.01 (J) S = 261.13 (J/K) V = 40.91 (cc) Cp = 134.04 (J/K)

Oxygen delta moles = 8.1048e-05 delta grams = 0.00259344
G = -25.03 (J) H = 2.86 (J) S = 0.02 (J/K) V = 9.12 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1070.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.30 COH = 2.12 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 99.02 (gm) density = 2.44 (gm/cc) viscosity = 5.90 (log 10 poise) (analysis in wt %)
G = -1632235.73 (J) H = -1285985.57 (J) S = 257.79 (J/K) V = 40.58 (cc) Cp = 132.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.28 | 0.40 | 13.78 | 0.67 | 0.00 | 2.81 | 0.10 | 0.98 | 0.00 | 0.00 | 2.41 | 4.03 | 2.42 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.99 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.64Mg1.26Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -14454.53 (J) H = -11446.78 (J) S = 2.24 (J/K) V = 0.29 (cc) Cp = 1.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.46 | 96.21 | 64.13 | 3.62 | -3.45 | 5.65 | 0.31 |

Total solids mass = 0.99 (gm) density = 3.38 (gm/cc)
G = -14454.53 (J) H = -11446.78 (J) S = 2.24 (J/K) V = 0.29 (cc) Cp = 1.19 (J/K)

Viscosity of the System: 5.92 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1646690.25 (J) H = -1297432.35 (J) S = 260.03 (J/K) V = 40.87 (cc) Cp = 133.88 (J/K)

Oxygen delta moles = 5.24358e-05 delta grams = 0.00167788
G = -16.06 (J) H = 1.83 (J) S = 0.01 (J/K) V = 5.86 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1060.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.29 COH = 2.10 IW

= 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 98.64 (gm) density = 2.44 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -1624219.61 (J) H = -1283144.47 (J) S = 255.84 (J/K) V = 40.42 (cc) Cp = 132.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.35 | 0.41 | 13.82 | 0.66 | 0.00 | 2.75 | 0.10 | 0.90 | 0.00 | 0.00 | 2.42 | 4.05 | 2.43 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.36 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.66Mg1.23Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -19858.96 (J) H = -15750.67 (J) S = 3.08 (J/K) V = 0.40 (cc) Cp = 1.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.80 | 96.08 | 66.43 | 3.74 | -3.57 | 5.81 | 0.32 |

Total solids mass = 1.36 (gm) density = 3.39 (gm/cc)
G = -19858.96 (J) H = -15750.67 (J) S = 3.08 (J/K) V = 0.40 (cc) Cp = 1.63 (J/K)

Viscosity of the System: 6.03 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1644078.56 (J) H = -1298895.14 (J) S = 258.92 (J/K) V = 40.83 (cc) Cp = 133.72 (J/K)

Oxygen delta moles = 2.14897e-05 delta grams = 0.000687643
G = -6.53 (J) H = 0.74 (J) S = 0.01 (J/K) V = 2.38 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1050.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.29 COH = 2.08 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 98.26 (gm) density = 2.44 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -1616368.12 (J) H = -1280407.95 (J) S = 253.91 (J/K) V = 40.27 (cc) Cp = 131.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.43 | 0.41 | 13.86 | 0.65 | 0.00 | 2.67 | 0.10 | 0.83 | 0.00 | 0.00 | 2.42 | 4.06 | 2.44 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.74 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.69Mg1.21Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -25108.54 (J) H = -19944.72 (J) S = 3.90 (J/K) V = 0.51 (cc) Cp = 2.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.17 | 95.95 | 68.75 | 3.87 | -3.70 | 5.99 | 0.33 |

Total solids mass = 1.74 (gm) density = 3.40 (gm/cc)
G = -25108.54 (J) H = -19944.72 (J) S = 3.90 (J/K) V = 0.51 (cc) Cp = 2.07 (J/K)

Viscosity of the System: 6.14 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1641476.67 (J) H = -1300352.67 (J) S = 257.81 (J/K) V = 40.78 (cc) Cp = 133.57 (J/K)

Oxygen delta moles = -1.18754e-05 delta grams = -0.00038
G = 3.58 (J) H = -0.41 (J) S = -0.00 (J/K) V = -1.31 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1040.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.28 COH = 2.06 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 95.34 (gm) density = 2.44 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -1566160.11 (J) H = -1243878.93 (J) S = 245.43 (J/K) V = 39.11 (cc) Cp = 127.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.80 | 0.42 | 13.67 | 0.64 | 0.00 | 2.63 | 0.11 | 0.75 | 0.00 | 0.00 | 2.35 | 3.98 | 2.50 | 0.11 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.26 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.72Mg1.17Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -32423.50 (J) H = -25782.68 (J) S = 5.06 (J/K) V = 0.66 (cc) Cp = 2.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.73 | 96.02 | 72.16 | 3.88 | -3.72 | 6.06 | 0.32 |

feldspar mass = 2.40 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.27Al1.27Si2.73O8
G = -40287.04 (J) H = -32790.39 (J) S = 5.71 (J/K) V = 0.92 (cc) Cp = 2.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.63 | 27.10 | 3.26 |

Total solids mass = 4.66 (gm) density = 2.94 (gm/cc)
G = -72710.54 (J) H = -58573.06 (J) S = 10.77 (J/K) V = 1.58 (cc) Cp = 5.62 (J/K)

Viscosity of the System: 6.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1638870.65 (J) H = -1302451.99 (J) S = 256.19 (J/K) V = 40.70 (cc) Cp = 132.94 (J/K)

Oxygen delta moles = -7.72842e-05 delta grams = -0.002473
G = 23.09 (J) H = -2.61 (J) S = -0.02 (J/K) V = -8.44 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1030.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.27 COH = 2.04 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 91.99 (gm) density = 2.43 (gm/cc) viscosity = 6.34 (log 10 poise) (analysis in wt %)
G = -1509253.73 (J) H = -1201809.51 (J) S = 235.92 (J/K) V = 37.79 (cc) Cp = 122.58 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.23 0.44 13.42 0.63 0.00 2.58 0.11 0.68 0.00 0.00 2.27 3.88 2.57 0.11 1.09 0.00 0.00 0.00 0.00

orthopyroxene mass = 2.80 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.76Mg1.14Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -39752.16 (J) H = -31641.33 (J) S = 6.22 (J/K) V = 0.82 (cc) Cp = 3.31 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-78.55 96.14 75.82 3.87 -3.71 6.11 0.32

feldspar mass = 5.20 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.26Al1.26Si2.74O8
G = -87270.41 (J) H = -71187.12 (J) S = 12.34 (J/K) V = 2.00 (cc) Cp = 6.40 (J/K)
albite anorthite sanidine
70.25 26.33 3.42

Total solids mass = 8.00 (gm) density = 2.84 (gm/cc)
G = -127022.57 (J) H = -102828.46 (J) S = 18.57 (J/K) V = 2.82 (cc) Cp = 9.71 (J/K)

Viscosity of the System: 6.47 (log 10 poise)

System mass = 99.99 (gm) density = 2.46 (gm/cc)
G = -1636276.30 (J) H = -1304637.96 (J) S = 254.49 (J/K) V = 40.61 (cc) Cp = 132.29 (J/K)

Oxygen delta moles = -0.000152872 delta grams = -0.00489171
G = 45.28 (J) H = -5.11 (J) S = -0.04 (J/K) V = -16.56 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1020.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.27 COH = 2.02 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 85.95 (gm) density = 2.43 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -1407707.94 (J) H = -1123262.52 (J) S = 219.96 (J/K) V = 35.35 (cc) Cp = 114.41 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
72.27 0.47 13.32 0.63 0.00 2.58 0.12 0.61 0.00 0.00 2.20 3.80 2.72 0.12 1.17 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.42 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.80Mg1.10Fe'"0.03Ti0.00Al0.11Si1.94O6
G = -48000.65 (J) H = -38240.13 (J) S = 7.55 (J/K) V = 0.99 (cc) Cp = 4.02 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-82.71 96.26 79.69 3.93 -3.76 6.28 0.31

feldspar mass = 8.86 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.26Al1.26Si2.74O8
G = -148586.91 (J) H = -121471.93 (J) S = 20.97 (J/K) V = 3.41 (cc) Cp = 10.90 (J/K)
albite anorthite sanidine
70.54 25.77 3.69

quartz mass = 1.75 (gm) density = 2.55 (gm/cc)
SiO2
G = -29397.53 (J) H = -24329.44 (J) S = 3.92 (J/K) V = 0.69 (cc) Cp = 2.08 (J/K)

Total solids mass = 14.04 (gm) density = 2.76 (gm/cc)
G = -225985.09 (J) H = -184041.49 (J) S = 32.44 (J/K) V = 5.09 (cc) Cp = 17.01 (J/K)

Viscosity of the System: 6.63 (log 10 poise)

System mass = 99.99 (gm) density = 2.47 (gm/cc)
G = -1633693.04 (J) H = -1307304.02 (J) S = 252.40 (J/K) V = 40.44 (cc) Cp = 131.42 (J/K)

Oxygen delta moles = -0.000242207 delta grams = -0.00775032
G = 71.12 (J) H = -8.01 (J) S = -0.06 (J/K) V = -26.04 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1010.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.26 COH = 2.00 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 79.65 (gm) density = 2.43 (gm/cc) viscosity = 6.38 (log 10 poise) (analysis in wt %)
G = -1302188.52 (J) H = -1041041.12 (J) S = 203.52 (J/K) V = 32.79 (cc) Cp = 105.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.18 | 0.50 | 13.29 | 0.64 | 0.00 | 2.57 | 0.13 | 0.55 | 0.00 | 0.00 | 2.14 | 3.73 | 2.90 | 0.13 | 1.26 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.03 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.83Mg1.06Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -55869.47 (J) H = -44549.82 (J) S = 8.82 (J/K) V = 1.16 (cc) Cp = 4.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.83 | 96.38 | 83.49 | 4.00 | -3.83 | 6.48 | 0.31 |

feldspar mass = 12.46 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -208516.45 (J) H = -170843.68 (J) S = 29.36 (J/K) V = 4.80 (cc) Cp = 15.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.70 | 25.31 | 4.00 |

quartz mass = 3.85 (gm) density = 2.55 (gm/cc)
SiO2
G = -64555.16 (J) H = -53542.92 (J) S = 8.58 (J/K) V = 1.51 (cc) Cp = 4.58 (J/K)

Total solids mass = 20.34 (gm) density = 2.72 (gm/cc)
G = -328941.07 (J) H = -268936.43 (J) S = 46.76 (J/K) V = 7.47 (cc) Cp = 24.60 (J/K)

Viscosity of the System: 6.79 (log 10 poise)

System mass = 99.99 (gm) density = 2.48 (gm/cc)
G = -1631129.60 (J) H = -1309977.55 (J) S = 250.28 (J/K) V = 40.26 (cc) Cp = 130.55 (J/K)

Oxygen delta moles = -0.000335016 delta grams = -0.0107201
G = 97.53 (J) H = -10.96 (J) S = -0.08 (J/K) V = -35.74 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1000.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.25 COH = 1.98 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 74.06 (gm) density = 2.43 (gm/cc) viscosity = 6.40 (log 10 poise) (analysis in wt %)
G = -1208811.08 (J) H = -968261.95 (J) S = 188.94 (J/K) V = 30.53 (cc) Cp = 98.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.09 | 0.54 | 13.26 | 0.64 | 0.00 | 2.54 | 0.14 | 0.50 | 0.00 | 0.00 | 2.08 | 3.65 | 3.08 | 0.14 | 1.35 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.58 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.02Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -62931.58 (J) H = -50233.49 (J) S = 9.97 (J/K) V = 1.31 (cc) Cp = 5.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.70 | 96.49 | 87.06 | 4.08 | -3.89 | 6.67 | 0.30 |

feldspar mass = 15.65 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -261507.17 (J) H = -214736.65 (J) S = 36.74 (J/K) V = 6.03 (cc) Cp = 19.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.80 | 24.89 | 4.31 |

quartz mass = 5.70 (gm) density = 2.55 (gm/cc)
SiO2
G = -95337.60 (J) H = -79247.01 (J) S = 12.64 (J/K) V = 2.23 (cc) Cp = 6.77 (J/K)

Total solids mass = 25.93 (gm) density = 2.71 (gm/cc)
G = -419776.35 (J) H = -344217.15 (J) S = 59.35 (J/K) V = 9.58 (cc) Cp = 31.31 (J/K)

Viscosity of the System: 6.96 (log 10 poise)

System mass = 99.99 (gm) density = 2.49 (gm/cc)
G = -1628587.43 (J) H = -1312479.10 (J) S = 248.29 (J/K) V = 40.10 (cc) Cp = 129.77 (J/K)

Oxygen delta moles = -0.000426579 delta grams = -0.01365
G = 123.11 (J) H = -13.81 (J) S = -0.11 (J/K) V = -45.15 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 990.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.25 COH = 1.96 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 69.06 (gm) density = 2.42 (gm/cc) viscosity = 6.41 (log 10 poise) (analysis in wt %)
G = -1125644.61 (J) H = -903418.57 (J) S = 175.93 (J/K) V = 28.50 (cc) Cp = 91.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.01 | 0.58 | 13.23 | 0.63 | 0.00 | 2.49 | 0.15 | 0.45 | 0.00 | 0.00 | 2.04 | 3.57 | 3.25 | 0.15 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.09 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg0.99Fe"'0.03Ti0.00Al0.11Si1.93O6
G = -69291.24 (J) H = -55375.08 (J) S = 11.02 (J/K) V = 1.45 (cc) Cp = 5.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.31 | 96.60 | 90.37 | 4.15 | -3.95 | 6.84 | 0.29 |

feldspar mass = 18.50 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -308641.46 (J) H = -254004.38 (J) S = 43.25 (J/K) V = 7.13 (cc) Cp = 22.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.87 | 24.50 | 4.63 |

quartz mass = 7.33 (gm) density = 2.55 (gm/cc)
SiO2
G = -122488.45 (J) H = -102037.35 (J) S = 16.19 (J/K) V = 2.87 (cc) Cp = 8.70 (J/K)

Total solids mass = 30.92 (gm) density = 2.70 (gm/cc)
G = -500421.14 (J) H = -411416.82 (J) S = 70.46 (J/K) V = 11.45 (cc) Cp = 37.28 (J/K)

Viscosity of the System: 7.15 (log 10 poise)

System mass = 99.98 (gm) density = 2.50 (gm/cc)
G = -1626065.75 (J) H = -1314835.40 (J) S = 246.39 (J/K) V = 39.96 (cc) Cp = 129.07 (J/K)

Oxygen delta moles = -0.000516338 delta grams = -0.0165222
G = 147.71 (J) H = -16.53 (J) S = -0.13 (J/K) V = -54.23 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 980.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.24 COH = 1.93 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 64.57 (gm) density = 2.42 (gm/cc) viscosity = 6.42 (log 10 poise) (analysis in wt %)
G = -1051164.90 (J) H = -845322.27 (J) S = 164.26 (J/K) V = 26.69 (cc) Cp = 85.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.93 | 0.62 | 13.21 | 0.62 | 0.00 | 2.43 | 0.16 | 0.41 | 0.00 | 0.00 | 2.00 | 3.49 | 3.43 | 0.16 | 1.55 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.56 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.96Fe"'0.03Ti0.00Al0.11Si1.93O6
G = -75024.04 (J) H = -60035.49 (J) S = 11.96 (J/K) V = 1.58 (cc) Cp = 6.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.62 | 96.70 | 93.42 | 4.21 | -4.00 | 7.00 | 0.29 |

feldspar mass = 21.06 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -350780.02 (J) H = -289325.22 (J) S = 49.04 (J/K) V = 8.11 (cc) Cp = 25.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.91 | 24.15 | 4.95 |

quartz mass = 8.79 (gm) density = 2.55 (gm/cc)
SiO2
G = -146594.99 (J) H = -122384.46 (J) S = 19.32 (J/K) V = 3.44 (cc) Cp = 10.41 (J/K)

Total solids mass = 35.41 (gm) density = 2.69 (gm/cc)
G = -572399.04 (J) H = -471745.17 (J) S = 80.32 (J/K) V = 13.14 (cc) Cp = 42.63 (J/K)

Viscosity of the System: 7.35 (log 10 poise)

System mass = 99.98 (gm) density = 2.51 (gm/cc)
G = -1623563.95 (J) H = -1317067.43 (J) S = 244.58 (J/K) V = 39.83 (cc) Cp = 128.42 (J/K)

Oxygen delta moles = -0.000603718 delta grams = -0.0193183
G = 171.19 (J) H = -19.11 (J) S = -0.15 (J/K) V = -62.90 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 970.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.24 COH = 1.91 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 60.52 (gm) density = 2.42 (gm/cc) viscosity = 6.43 (log 10 poise) (analysis in wt %)
G = -984145.26 (J) H = -793016.67 (J) S = 153.75 (J/K) V = 25.05 (cc) Cp = 80.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.85 | 0.66 | 13.19 | 0.61 | 0.00 | 2.35 | 0.17 | 0.37 | 0.00 | 0.00 | 1.96 | 3.41 | 3.60 | 0.17 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.99 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.93Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -80187.59 (J) H = -64260.85 (J) S = 12.81 (J/K) V = 1.70 (cc) Cp = 6.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.62 | 96.79 | 96.20 | 4.27 | -4.04 | 7.13 | 0.28 |

feldspar mass = 23.37 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -388620.47 (J) H = -321248.77 (J) S = 54.19 (J/K) V = 9.00 (cc) Cp = 28.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.91 | 23.82 | 5.27 |

quartz mass = 10.09 (gm) density = 2.55 (gm/cc)
SiO2
G = -168128.19 (J) H = -140665.77 (J) S = 22.09 (J/K) V = 3.96 (cc) Cp = 11.95 (J/K)

Total solids mass = 39.45 (gm) density = 2.69 (gm/cc)

G = -636936.25 (J)  H = -526175.39 (J)  S = 89.10 (J/K)  V = 14.66 (cc)  Cp = 47.43 (J/K)

Viscosity of the System: 7.59 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.52 (gm/cc)
G = -1621081.51 (J)  H = -1319192.06 (J)  S = 242.84 (J/K)  V = 39.71 (cc)  Cp = 127.83 (J/K)

Oxygen  delta moles = -0.000688192  delta grams = -0.0220213
G = 193.42 (J)  H = -21.53 (J)  S = -0.17 (J/K)  V = -71.13 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 960.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = 0.23  COH = 1.89  IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 56.86 (gm)  density = 2.41 (gm/cc)  viscosity = 6.44 (log 10 poise)  (analysis in wt %)
G = -923580.26 (J)  H = -745718.34 (J)  S = 144.23 (J/K)  V = 23.57 (cc)  Cp = 75.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.78 | 0.70 | 13.17 | 0.59 | 0.00 | 2.26 | 0.18 | 0.34 | 0.00 | 0.00 | 1.93 | 3.33 | 3.77 | 0.18 | 1.76 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.39 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.91Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -84828.93 (J)  H = -68088.42 (J)  S = 13.58 (J/K)  V = 1.81 (cc)  Cp = 7.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.33 | 96.88 | 98.70 | 4.32 | -4.08 | 7.23 | 0.28 |

feldspar  mass = 25.46 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -422738.08 (J)  H = -350228.23 (J)  S = 58.80 (J/K)  V = 9.81 (cc)  Cp = 31.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.88 | 23.53 | 5.59 |

quartz  mass = 11.27 (gm)  density = 2.55 (gm/cc)
SiO2
G = -187470.73 (J)  H = -157188.13 (J)  S = 24.56 (J/K)  V = 4.42 (cc)  Cp = 13.33 (J/K)

Total solids  mass = 43.12 (gm)  density = 2.69 (gm/cc)
G = -695037.74 (J)  H = -575504.78 (J)  S = 96.93 (J/K)  V = 16.03 (cc)  Cp = 51.76 (J/K)

Viscosity of the System: 7.88 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.52 (gm/cc)
G = -1618617.99 (J)  H = -1321223.12 (J)  S = 241.17 (J/K)  V = 39.60 (cc)  Cp = 127.29 (J/K)

Oxygen  delta moles = -0.000769323  delta grams = -0.0246174
G = 214.29 (J)  H = -23.80 (J)  S = -0.19 (J/K)  V = -78.88 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 950.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = 0.22  COH = 1.87  IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 53.53 (gm)  density = 2.41 (gm/cc)  viscosity = 6.45 (log 10 poise)  (analysis in wt %)
G = -868632.48 (J)  H = -702775.08 (J)  S = 135.60 (J/K)  V = 22.22 (cc)  Cp = 71.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.70 | 0.74 | 13.16 | 0.58 | 0.00 | 2.16 | 0.19 | 0.31 | 0.00 | 0.00 | 1.90 | 3.25 | 3.95 | 0.19 | 1.87 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.75 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.88Fe"'0.03Ti0.00Al0.12Si1.92O6
G = -88989.29 (J)  H = -71550.38 (J)  S = 14.26 (J/K)  V = 1.90 (cc)  Cp = 7.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.75 | 96.95 | 100.96 | 4.37 | -4.11 | 7.31 | 0.27 |

feldspar  mass = 27.36 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -453614.17 (J)  H = -376642.89 (J)  S = 62.93 (J/K)  V = 10.54 (cc)  Cp = 33.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.83 | 23.26 | 5.92 |

quartz  mass = 12.33 (gm)  density = 2.55 (gm/cc)
SiO2
G = -204937.04 (J)  H = -172203.82 (J)  S = 26.76 (J/K)  V = 4.83 (cc)  Cp = 14.58 (J/K)

Total solids  mass = 46.45 (gm)  density = 2.69 (gm/cc)
G = -747540.49 (J)  H = -620397.08 (J)  S = 103.95 (J/K)  V = 17.28 (cc)  Cp = 55.69 (J/K)

Viscosity of the System: 8.25 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.53 (gm/cc)
G = -1616172.97 (J)  H = -1323172.16 (J)  S = 239.55 (J/K)  V = 39.50 (cc)  Cp = 126.78 (J/K)

Oxygen  delta moles = -0.000846784  delta grams = -0.0270961
G = 233.74 (J)  H = -25.89 (J)  S = -0.21 (J/K)  V = -86.11 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 940.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = 0.21  COH = 1.84  IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 50.49 (gm)  density = 2.41 (gm/cc)  viscosity = 6.46 (log 10 poise)  (analysis in wt %)
G = -818595.01 (J)  H = -663636.62 (J)  S = 127.73 (J/K)  V = 20.99 (cc)  Cp = 67.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.62 | 0.79 | 13.15 | 0.55 | 0.00 | 2.06 | 0.20 | 0.29 | 0.00 | 0.00 | 1.87 | 3.17 | 4.11 | 0.20 | 1.99 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.08 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.86Fe"'0.03Ti0.00Al0.12Si1.92O6
G = -92706.81 (J) H = -74676.10 (J) S = 14.86 (J/K) V = 1.99 (cc) Cp = 8.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.91 | 97.02 | 102.98 | 4.41 | -4.13 | 7.37 | 0.26 |

feldspar mass = 29.10 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -481656.35 (J) H = -400814.14 (J) S = 66.64 (J/K) V = 11.21 (cc) Cp = 35.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.75 | 23.00 | 6.25 |

quartz mass = 13.30 (gm) density = 2.55 (gm/cc)
SiO2
G = -220787.87 (J) H = -185922.16 (J) S = 28.74 (J/K) V = 5.22 (cc) Cp = 15.71 (J/K)

Total solids mass = 49.48 (gm) density = 2.69 (gm/cc)
G = -795151.04 (J) H = -661412.40 (J) S = 110.24 (J/K) V = 18.41 (cc) Cp = 59.25 (J/K)

Viscosity of the System: 8.82 (log 10 poise)

System mass = 99.97 (gm) density = 2.54 (gm/cc)
G = -1613746.05 (J) H = -1325049.02 (J) S = 237.97 (J/K) V = 39.40 (cc) Cp = 126.31 (J/K)

Oxygen delta moles = -0.000920363 delta grams = -0.0294505
G = 251.74 (J) H = -27.81 (J) S = -0.23 (J/K) V = -92.83 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 47.56 (gm) density = 2.40 (gm/cc) viscosity = 6.46 (log 10 poise) (analysis in wt %)
G = -770661.65 (J) H = -626053.91 (J) S = 120.19 (J/K) V = 19.81 (cc) Cp = 63.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.58 | 0.78 | 13.16 | 0.53 | 0.00 | 1.94 | 0.21 | 0.27 | 0.00 | 0.00 | 1.85 | 3.09 | 4.29 | 0.21 | 2.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.34 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.85Fe"'0.03Ti0.00Al0.12Si1.92O6
G = -95633.30 (J) H = -77190.93 (J) S = 15.33 (J/K) V = 2.06 (cc) Cp = 8.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.54 | 97.08 | 104.55 | 4.42 | -4.15 | 7.38 | 0.26 |

feldspar mass = 30.75 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.23Al1.23Si2.77O8
G = -508228.02 (J) H = -423863.02 (J) S = 70.12 (J/K) V = 11.84 (cc) Cp = 37.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.61 | 22.78 | 6.61 |

quartz mass = 14.25 (gm) density = 2.55 (gm/cc)
SiO2
G = -236248.10 (J) H = -199368.00 (J) S = 30.65 (J/K) V = 5.59 (cc) Cp = 16.82 (J/K)

rhm-oxide mass = 0.06 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.10Fe'''0.23Al0.11Ti0.83O3
G = -572.87 (J) H = -437.68 (J) S = 0.11 (J/K) V = 0.01 (cc) Cp = 0.06 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.75 | 11.67 | 70.65 | 2.64 | 5.30 |

Total solids mass = 52.40 (gm) density = 2.69 (gm/cc)
G = -840682.28 (J) H = -700859.63 (J) S = 116.21 (J/K) V = 19.50 (cc) Cp = 62.67 (J/K)

Viscosity of the System: 10.67 (log 10 poise)

System mass = 99.97 (gm) density = 2.54 (gm/cc)
G = -1611343.93 (J) H = -1326913.53 (J) S = 236.40 (J/K) V = 39.31 (cc) Cp = 125.84 (J/K)

Oxygen delta moles = -0.000976816 delta grams = -0.0312569
G = 264.74 (J) H = -29.17 (J) S = -0.24 (J/K) V = -97.71 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 920.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.20 COH = 1.79 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 44.78 (gm) density = 2.40 (gm/cc) viscosity = 6.47 (log 10 poise) (analysis in wt %)
G = -725266.05 (J) H = -590379.54 (J) S = 113.05 (J/K) V = 18.70 (cc) Cp = 59.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.56 | 0.73 | 13.17 | 0.50 | 0.00 | 1.81 | 0.22 | 0.25 | 0.00 | 0.00 | 1.82 | 3.01 | 4.46 | 0.22 | 2.24 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.55 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.84Fe'''0.03Ti0.00Al0.12Si1.92O6
G = -97897.52 (J) H = -79193.20 (J) S = 15.68 (J/K) V = 2.11 (cc) Cp = 8.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.76 | 97.12 | 105.77 | 4.42 | -4.17 | 7.36 | 0.25 |

feldspar mass = 32.32 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -533202.70 (J) H = -445675.41 (J) S = 73.36 (J/K) V = 12.45 (cc) Cp = 39.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.41 | 22.59 | 7.00 |

quartz mass = 15.17 (gm) density = 2.55 (gm/cc)
SiO2
G = -251094.10 (J) H = -212350.03 (J) S = 32.47 (J/K) V = 5.95 (cc) Cp = 17.89 (J/K)

rhm-oxide mass = 0.15 (gm) density = 4.64 (gm/cc) (analysis in mole %)

Mn0.03Fe"0.71Mg0.10Fe'''0.23Al0.10Ti0.83O3
G = -1504.10 (J) H = -1152.55 (J) S = 0.29 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.52 | 11.60 | 70.94 | 2.77 | 5.17 |

Total solids mass = 55.18 (gm) density = 2.69 (gm/cc)
G = -883698.41 (J) H = -738371.20 (J) S = 121.80 (J/K) V = 20.54 (cc) Cp = 65.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.55 (gm/cc)
G = -1608964.47 (J) H = -1328750.74 (J) S = 234.85 (J/K) V = 39.23 (cc) Cp = 125.39 (J/K)

Oxygen delta moles = -0.00102028 delta grams = -0.0326477
G = 273.97 (J) H = -30.10 (J) S = -0.25 (J/K) V = -101.21 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 910.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.19 COH = 1.77 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 42.24 (gm) density = 2.39 (gm/cc) viscosity = 6.47 (log 10 poise) (analysis in wt %)
G = -683785.74 (J) H = -557739.15 (J) S = 106.53 (J/K) V = 17.67 (cc) Cp = 56.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.52 | 0.69 | 13.18 | 0.48 | 0.00 | 1.69 | 0.23 | 0.23 | 0.00 | 0.00 | 1.80 | 2.94 | 4.63 | 0.24 | 2.37 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.73 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.07Mg0.83Fe'''0.03Ti0.00Al0.12Si1.92O6
G = -99863.32 (J) H = -80967.27 (J) S = 15.97 (J/K) V = 2.16 (cc) Cp = 8.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.82 | 97.15 | 106.85 | 4.42 | -4.18 | 7.32 | 0.25 |

feldspar mass = 33.75 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.22Al1.22Si2.78O8
G = -556007.93 (J) H = -465763.09 (J) S = 76.28 (J/K) V = 13.00 (cc) Cp = 41.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.20 | 22.40 | 7.40 |

quartz mass = 16.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -264636.50 (J) H = -224280.63 (J) S = 34.11 (J/K) V = 6.28 (cc) Cp = 18.86 (J/K)

rhm-oxide mass = 0.24 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.09Fe'''0.23Al0.10Ti0.83O3
G = -2307.72 (J) H = -1773.69 (J) S = 0.45 (J/K) V = 0.05 (cc) Cp = 0.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.32 | 11.52 | 71.22 | 2.89 | 5.05 |

Total solids mass = 57.72 (gm) density = 2.69 (gm/cc)

G = -922815.47 (J)  H = -772784.68 (J)  S = 126.81 (J/K)  V = 21.48 (cc)  Cp = 68.84 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.55 (gm/cc)
G = -1606601.21 (J)  H = -1330523.83 (J)  S = 233.34 (J/K)  V = 39.15 (cc)  Cp = 124.97 (J/K)

Oxygen  delta moles = -0.00106213  delta grams = -0.0339868
G = 282.55 (J)  H = -30.96 (J)  S = -0.26 (J/K)  V = -104.48 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 900.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = 0.19  COH = 1.74  IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid  mass = 39.91 (gm)  density = 2.39 (gm/cc)  viscosity = 6.47 (log 10 poise)  (analysis in wt %)
G = -645680.83 (J)  H = -527710.99 (J)  S = 100.56 (J/K)  V = 16.73 (cc)  Cp = 53.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.48 | 0.65 | 13.19 | 0.45 | 0.00 | 1.57 | 0.24 | 0.21 | 0.00 | 0.00 | 1.79 | 2.86 | 4.80 | 0.25 | 2.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 7.89 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.82Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -101566.00 (J)  H = -82539.77 (J)  S = 16.22 (J/K)  V = 2.20 (cc)  Cp = 8.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.75 | 97.19 | 107.81 | 4.42 | -4.19 | 7.28 | 0.24 |

feldspar  mass = 35.08 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -576943.24 (J)  H = -484365.47 (J)  S = 78.91 (J/K)  V = 13.51 (cc)  Cp = 42.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.97 | 22.22 | 7.81 |

quartz  mass = 16.78 (gm)  density = 2.55 (gm/cc)
SiO2
G = -277059.37 (J)  H = -235309.00 (J)  S = 35.59 (J/K)  V = 6.58 (cc)  Cp = 19.75 (J/K)

rhm-oxide  mass = 0.31 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.71Mg0.09Fe'"0.23Al0.10Ti0.84O3
G = -3004.35 (J)  H = -2316.19 (J)  S = 0.59 (J/K)  V = 0.07 (cc)  Cp = 0.29 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.13 | 11.41 | 71.50 | 3.02 | 4.94 |

Total solids  mass = 60.06 (gm)  density = 2.69 (gm/cc)
G = -958572.95 (J)  H = -804530.43 (J)  S = 131.31 (J/K)  V = 22.35 (cc)  Cp = 71.54 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.56 (gm/cc)
G = -1604253.78 (J)  H = -1332241.42 (J)  S = 231.86 (J/K)  V = 39.08 (cc)  Cp = 124.58 (J/K)

Oxygen delta moles = -0.00110235 delta grams = -0.0352737
G = 290.50 (J) H = -31.74 (J) S = -0.27 (J/K) V = -107.52 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 890.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.18 COH = 1.72 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 37.75 (gm) density = 2.38 (gm/cc) viscosity = 6.46 (log 10 poise) (analysis in wt %)
G = -610495.91 (J) H = -499939.06 (J) S = 95.05 (J/K) V = 15.86 (cc) Cp = 50.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.41 | 0.61 | 13.21 | 0.42 | 0.00 | 1.46 | 0.25 | 0.20 | 0.00 | 0.00 | 1.77 | 2.79 | 4.95 | 0.27 | 2.66 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.03 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.09Mg0.81Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -103037.25 (J) H = -83934.62 (J) S = 16.42 (J/K) V = 2.24 (cc) Cp = 9.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.55 | 97.22 | 108.65 | 4.42 | -4.20 | 7.22 | 0.24 |

feldspar mass = 36.31 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -596262.00 (J) H = -501685.30 (J) S = 81.31 (J/K) V = 13.98 (cc) Cp = 44.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.73 | 22.04 | 8.23 |

quartz mass = 17.50 (gm) density = 2.55 (gm/cc)
SiO2
G = -288516.05 (J) H = -245559.52 (J) S = 36.93 (J/K) V = 6.86 (cc) Cp = 20.58 (J/K)

rhm-oxide mass = 0.37 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.23Al0.10Ti0.84O3
G = -3610.65 (J) H = -2792.26 (J) S = 0.70 (J/K) V = 0.08 (cc) Cp = 0.35 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.97 | 11.28 | 71.78 | 3.14 | 4.83 |

Total solids mass = 62.21 (gm) density = 2.69 (gm/cc)
G = -991425.96 (J) H = -833971.70 (J) S = 135.37 (J/K) V = 23.16 (cc) Cp = 74.01 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.56 (gm/cc)
G = -1601921.87 (J) H = -1333910.77 (J) S = 230.42 (J/K) V = 39.02 (cc) Cp = 124.21 (J/K)

Oxygen delta moles = -0.00114093 delta grams = -0.0365083
G = 297.83 (J) H = -32.45 (J) S = -0.28 (J/K) V = -110.34 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 880.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -12.26  delta HM = -5.06  NNO = 0.00  QFM = 0.17  COH = 1.69  IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid  mass = 35.75 (gm)  density = 2.38 (gm/cc)  viscosity = 6.45 (log 10 poise)  (analysis in wt %)
G = -577843.81 (J)  H = -474120.42 (J)  S = 89.95 (J/K)  V = 15.05 (cc)  Cp = 47.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.33 | 0.57 | 13.22 | 0.40 | 0.00 | 1.36 | 0.26 | 0.19 | 0.00 | 0.00 | 1.76 | 2.72 | 5.11 | 0.28 | 2.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.16 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.09Mg0.80Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -104305.36 (J)  H = -85173.17 (J)  S = 16.59 (J/K)  V = 2.27 (cc)  Cp = 9.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.25 | 97.25 | 109.40 | 4.42 | -4.21 | 7.16 | 0.23 |

feldspar  mass = 37.46 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -614180.35 (J)  H = -517895.77 (J)  S = 83.50 (J/K)  V = 14.42 (cc)  Cp = 45.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.47 | 21.88 | 8.66 |

quartz  mass = 18.16 (gm)  density = 2.55 (gm/cc)
SiO2
G = -299135.45 (J)  H = -255136.84 (J)  S = 38.16 (J/K)  V = 7.12 (cc)  Cp = 21.34 (J/K)

rhm-oxide  mass = 0.43 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.22Al0.09Ti0.84O3
G = -4140.21 (J)  H = -3211.83 (J)  S = 0.81 (J/K)  V = 0.09 (cc)  Cp = 0.40 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.82 | 11.14 | 72.06 | 3.26 | 4.72 |

Total solids  mass = 64.21 (gm)  density = 2.69 (gm/cc)
G = -1021761.37 (J)  H = -861417.62 (J)  S = 139.05 (J/K)  V = 23.91 (cc)  Cp = 76.31 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.57 (gm/cc)
G = -1599605.18 (J)  H = -1335538.04 (J)  S = 229.00 (J/K)  V = 38.95 (cc)  Cp = 123.86 (J/K)

Oxygen  delta moles = -0.00117789  delta grams = -0.0376909
G = 304.55 (J)  H = -33.08 (J)  S = -0.29 (J/K)  V = -112.93 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 870.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -12.45  delta HM = -5.07  NNO = 0.00  QFM = 0.16  COH = 1.66  IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 33.89 (gm) density = 2.37 (gm/cc) viscosity = 6.44 (log 10 poise) (analysis in wt %)
G = -547392.83 (J) H = -449995.16 (J) S = 85.20 (J/K) V = 14.29 (cc) Cp = 45.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.24 | 0.54 | 13.24 | 0.38 | 0.00 | 1.26 | 0.27 | 0.18 | 0.00 | 0.00 | 1.75 | 2.65 | 5.25 | 0.30 | 2.96 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.27 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.80Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -105395.47 (J) H = -86274.40 (J) S = 16.73 (J/K) V = 2.30 (cc) Cp = 9.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.86 | 97.29 | 110.06 | 4.42 | -4.22 | 7.09 | 0.23 |

feldspar mass = 38.54 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -630884.10 (J) H = -533146.08 (J) S = 85.50 (J/K) V = 14.84 (cc) Cp = 46.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.19 | 21.72 | 9.10 |

quartz mass = 18.79 (gm) density = 2.55 (gm/cc)
SiO2
G = -309026.89 (J) H = -264129.81 (J) S = 39.27 (J/K) V = 7.37 (cc) Cp = 22.05 (J/K)

rhm-oxide mass = 0.47 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.22Al0.09Ti0.84O3
G = -4604.19 (J) H = -3583.04 (J) S = 0.89 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.68 | 10.98 | 72.34 | 3.38 | 4.62 |

Total solids mass = 66.07 (gm) density = 2.69 (gm/cc)
G = -1049910.65 (J) H = -887133.34 (J) S = 142.39 (J/K) V = 24.60 (cc) Cp = 78.44 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1597303.48 (J) H = -1337128.50 (J) S = 227.59 (J/K) V = 38.89 (cc) Cp = 123.53 (J/K)

Oxygen delta moles = -0.00121325 delta grams = -0.0388224
G = 310.68 (J) H = -33.64 (J) S = -0.30 (J/K) V = -115.31 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 860.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.64 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 32.14 (gm) density = 2.37 (gm/cc) viscosity = 6.42 (log 10 poise) (analysis in wt %)
G = -518856.64 (J) H = -427338.52 (J) S = 80.76 (J/K) V = 13.58 (cc) Cp = 42.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.12 | 0.50 | 13.26 | 0.36 | 0.00 | 1.17 | 0.28 | 0.17 | 0.00 | 0.00 | 1.74 | 2.58 | 5.39 | 0.31 | 3.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.36 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.11Mg0.79Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -106329.82 (J) H = -87255.12 (J) S = 16.83 (J/K) V = 2.32 (cc) Cp = 9.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.39 | 97.32 | 110.65 | 4.42 | -4.23 | 7.02 | 0.22 |

feldspar mass = 39.56 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.22Al1.22Si2.78O8
G = -646534.33 (J) H = -547565.84 (J) S = 87.34 (J/K) V = 15.23 (cc) Cp = 47.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.89 | 21.56 | 9.55 |

quartz mass = 19.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -318284.00 (J) H = -272614.62 (J) S = 40.30 (J/K) V = 7.60 (cc) Cp = 22.72 (J/K)

rhm-oxide mass = 0.52 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.22Al0.09Ti0.85O3
G = -5011.79 (J) H = -3912.61 (J) S = 0.97 (J/K) V = 0.11 (cc) Cp = 0.49 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.54 | 10.82 | 72.61 | 3.50 | 4.53 |

Total solids mass = 67.82 (gm) density = 2.69 (gm/cc)
G = -1076159.93 (J) H = -911348.19 (J) S = 145.45 (J/K) V = 25.26 (cc) Cp = 80.43 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1595016.57 (J) H = -1338686.71 (J) S = 226.21 (J/K) V = 38.84 (cc) Cp = 123.22 (J/K)

Oxygen delta moles = -0.00124704 delta grams = -0.0399038
G = 316.24 (J) H = -34.14 (J) S = -0.31 (J/K) V = -117.49 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 850.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.61 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 30.50 (gm) density = 2.36 (gm/cc) viscosity = 6.40 (log 10 poise) (analysis in wt %)
G = -491986.06 (J) H = -405954.46 (J) S = 76.60 (J/K) V = 12.91 (cc) Cp = 40.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.99 | 0.47 | 13.28 | 0.34 | 0.00 | 1.08 | 0.30 | 0.16 | 0.00 | 0.00 | 1.73 | 2.52 | 5.52 | 0.33 | 3.29 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.45 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.11Mg0.79Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -107128.03 (J) H = -88130.19 (J) S = 16.91 (J/K) V = 2.35 (cc) Cp = 9.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.86 | 97.35 | 111.17 | 4.42 | -4.24 | 6.95 | 0.22 |

feldspar mass = 40.53 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -661271.79 (J) H = -561268.56 (J) S = 89.04 (J/K) V = 15.60 (cc) Cp = 49.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.58 | 21.40 | 10.01 |

quartz mass = 19.93 (gm) density = 2.55 (gm/cc)
SiO2
G = -326987.73 (J) H = -280657.26 (J) S = 41.25 (J/K) V = 7.81 (cc) Cp = 23.34 (J/K)

rhm-oxide mass = 0.56 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.08Fe'''0.21Al0.09Ti0.85O3
G = -5370.66 (J) H = -4206.11 (J) S = 1.04 (J/K) V = 0.12 (cc) Cp = 0.52 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.42 | 10.65 | 72.90 | 3.61 | 4.43 |

Total solids mass = 69.46 (gm) density = 2.68 (gm/cc)
G = -1100758.20 (J) H = -934262.12 (J) S = 148.24 (J/K) V = 25.88 (cc) Cp = 82.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1592744.26 (J) H = -1340216.58 (J) S = 224.84 (J/K) V = 38.78 (cc) Cp = 122.93 (J/K)

Oxygen delta moles = -0.00127932 delta grams = -0.0409366
G = 321.25 (J) H = -34.57 (J) S = -0.32 (J/K) V = -119.47 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 840.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.14 COH = 1.58 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 28.94 (gm) density = 2.36 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -466562.48 (J) H = -385670.49 (J) S = 72.67 (J/K) V = 12.27 (cc) Cp = 38.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.85 | 0.44 | 13.30 | 0.32 | 0.00 | 1.00 | 0.31 | 0.15 | 0.00 | 0.00 | 1.73 | 2.46 | 5.64 | 0.35 | 3.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.52 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.12Mg0.79Fe'''0.03Ti0.00Al0.12Si1.93O6
G = -107807.38 (J) H = -88912.71 (J) S = 16.97 (J/K) V = 2.36 (cc) Cp = 9.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.27 | 97.38 | 111.63 | 4.42 | -4.26 | 6.88 | 0.21 |

feldspar mass = 41.45 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.21Al1.21Si2.79O8
G = -675220.47 (J) H = -574354.59 (J) S = 90.61 (J/K) V = 15.95 (cc) Cp = 50.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.25 | 21.25 | 10.49 |

quartz mass = 20.46 (gm) density = 2.55 (gm/cc)
SiO2
G = -335208.89 (J) H = -288315.57 (J) S = 42.13 (J/K) V = 8.02 (cc) Cp = 23.94 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.08Fe'''0.21Al0.09Ti0.85O3
G = -5687.18 (J) H = -4468.21 (J) S = 1.10 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.30 | 10.47 | 73.18 | 3.72 | 4.34 |

Total solids mass = 71.02 (gm) density = 2.68 (gm/cc)
G = -1123923.93 (J) H = -956051.07 (J) S = 150.81 (J/K) V = 26.46 (cc) Cp = 84.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1590486.41 (J) H = -1341721.56 (J) S = 223.48 (J/K) V = 38.73 (cc) Cp = 122.65 (J/K)

Oxygen delta moles = -0.00131012 delta grams = -0.0419224
G = 325.75 (J) H = -34.94 (J) S = -0.32 (J/K) V = -121.25 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 830.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.13 COH = 1.55 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 27.46 (gm) density = 2.35 (gm/cc) viscosity = 6.33 (log 10 poise) (analysis in wt %)
G = -442392.27 (J) H = -366333.28 (J) S = 68.95 (J/K) V = 11.66 (cc) Cp = 36.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.68 | 0.41 | 13.32 | 0.30 | 0.00 | 0.93 | 0.32 | 0.14 | 0.00 | 0.00 | 1.73 | 2.40 | 5.75 | 0.37 | 3.65 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.59 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.12Mg0.78Fe'''0.03Ti0.00Al0.11Si1.93O6
G = -108383.08 (J) H = -89614.24 (J) S = 17.01 (J/K) V = 2.38 (cc) Cp = 9.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.63 | 97.41 | 112.05 | 4.43 | -4.27 | 6.81 | 0.21 |

feldspar mass = 42.33 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -688490.60 (J) H = -586913.45 (J) S = 92.08 (J/K) V = 16.29 (cc) Cp = 51.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.91 | 21.11 | 10.99 |

quartz mass = 20.96 (gm) density = 2.55 (gm/cc)
SiO2
G = -343010.21 (J) H = -295640.93 (J) S = 42.94 (J/K) V = 8.22 (cc) Cp = 24.50 (J/K)

rhm-oxide mass = 0.62 (gm) density = 4.67 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.73Mg0.08Fe'''0.21Al0.09Ti0.85O3
G = -5966.73 (J) H = -4702.80 (J) S = 1.15 (J/K) V = 0.13 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.18 | 10.28 | 73.46 | 3.82 | 4.26 |

Total solids mass = 72.50 (gm) density = 2.68 (gm/cc)
G = -1145850.62 (J) H = -976871.42 (J) S = 153.18 (J/K) V = 27.02 (cc) Cp = 85.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1588242.89 (J) H = -1343204.70 (J) S = 222.13 (J/K) V = 38.68 (cc) Cp = 122.39 (J/K)

Oxygen delta moles = -0.00133952 delta grams = -0.042863
G = 329.74 (J) H = -35.25 (J) S = -0.33 (J/K) V = -122.86 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 820.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.12 COH = 1.52 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 25.47 (gm) density = 2.35 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -410385.65 (J) H = -340258.40 (J) S = 64.15 (J/K) V = 10.85 (cc) Cp = 34.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.47 | 0.37 | 13.32 | 0.29 | 0.00 | 0.89 | 0.35 | 0.13 | 0.00 | 0.00 | 1.75 | 2.43 | 5.68 | 0.39 | 3.94 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.64 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.12Mg0.78Fe'''0.02Ti0.00Al0.11Si1.93O6
G = -108791.36 (J) H = -90184.16 (J) S = 17.02 (J/K) V = 2.39 (cc) Cp = 9.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.96 | 97.48 | 112.33 | 4.49 | -4.34 | 6.79 | 0.20 |

feldspar mass = 41.97 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.22Al1.22Si2.78O8
G = -681923.93 (J) H = -582642.78 (J) S = 90.82 (J/K) V = 16.14 (cc) Cp = 50.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.02 | 21.54 | 10.44 |

feldspar mass = 1.63 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -25761.99 (J) H = -21960.00 (J) S = 3.48 (J/K) V = 0.64 (cc) Cp = 1.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.92 | 2.43 | 63.65 |

quartz mass = 21.59 (gm) density = 2.55 (gm/cc)
SiO2
G = -352853.63 (J) H = -304757.39 (J) S = 44.00 (J/K) V = 8.46 (cc) Cp = 25.21 (J/K)

rhm-oxide mass = 0.66 (gm) density = 4.67 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.74Mg0.08Fe'''0.20Al0.08Ti0.86O3
G = -6299.02 (J) H = -4980.86 (J) S = 1.21 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.08 | 10.07 | 73.74 | 3.90 | 4.20 |

Total solids mass = 74.49 (gm) density = 2.68 (gm/cc)
G = -1175629.93 (J) H = -1004525.19 (J) S = 156.52 (J/K) V = 27.78 (cc) Cp = 88.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1586015.58 (J) H = -1344783.59 (J) S = 220.68 (J/K) V = 38.63 (cc) Cp = 122.08 (J/K)

Oxygen delta moles = -0.00136474 delta grams = -0.04367
G = 332.58 (J) H = -35.43 (J) S = -0.34 (J/K) V = -124.04 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 23.60 (gm) density = 2.34 (gm/cc) viscosity = 6.10 (log 10 poise) (analysis in wt %)
G = -380232.28 (J) H = -315620.32 (J) S = 59.65 (J/K) V = 10.08 (cc) Cp = 31.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.23 | 0.34 | 13.31 | 0.28 | 0.00 | 0.84 | 0.37 | 0.13 | 0.00 | 0.00 | 1.77 | 2.47 | 5.59 | 0.43 | 4.25 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.68 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.78Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -109135.29 (J) H = -90703.33 (J) S = 17.02 (J/K) V = 2.40 (cc) Cp = 9.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.26 | 97.55 | 112.59 | 4.55 | -4.41 | 6.78 | 0.20 |

feldspar mass = 41.65 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.22Al1.22Si2.78O8
G = -675991.08 (J) H = -578887.79 (J) S = 89.65 (J/K) V = 16.00 (cc) Cp = 50.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.15 | 21.96 | 9.89 |

feldspar mass = 3.15 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -49660.60 (J) H = -42426.97 (J) S = 6.68 (J/K) V = 1.24 (cc) Cp = 3.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.92 | 2.27 | 64.82 |

quartz mass = 22.19 (gm) density = 2.55 (gm/cc)
SiO2
G = -362200.53 (J) H = -313478.68 (J) S = 44.98 (J/K) V = 8.70 (cc) Cp = 25.88 (J/K)

rhm-oxide mass = 0.69 (gm) density = 4.67 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.74Mg0.08Fe'''0.20Al0.08Ti0.86O3
G = -6583.45 (J) H = -5222.67 (J) S = 1.26 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.98 | 9.86 | 74.03 | 3.97 | 4.15 |

Total solids mass = 76.36 (gm) density = 2.68 (gm/cc)
G = -1203570.94 (J) H = -1030719.44 (J) S = 159.58 (J/K) V = 28.50 (cc) Cp = 90.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1583803.23 (J) H = -1346339.76 (J) S = 219.23 (J/K) V = 38.57 (cc) Cp = 121.79 (J/K)

Oxygen delta moles = -0.00138909 delta grams = -0.0444492
G = 335.09 (J) H = -35.58 (J) S = -0.34 (J/K) V = -125.10 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 21.84 (gm) density = 2.33 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -352035.00 (J) H = -292519.04 (J) S = 55.46 (J/K) V = 9.36 (cc) Cp = 29.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.94 | 0.31 | 13.30 | 0.27 | 0.00 | 0.81 | 0.40 | 0.12 | 0.00 | 0.00 | 1.80 | 2.51 | 5.50 | 0.46 | 4.59 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.72 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.78Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -109427.75 (J) H = -91181.81 (J) S = 17.00 (J/K) V = 2.41 (cc) Cp = 9.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.56 | 97.62 | 112.83 | 4.62 | -4.48 | 6.78 | 0.20 |

feldspar mass = 41.40 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.68Ca0.22Al1.22Si2.78O8
G = -671275.18 (J) H = -576150.05 (J) S = 88.64 (J/K) V = 15.90 (cc) Cp = 50.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.28 | 22.34 | 9.37 |

feldspar mass = 4.52 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -71005.76 (J) H = -60799.30 (J) S = 9.51 (J/K) V = 1.78 (cc) Cp = 5.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.95 | 2.12 | 65.93 |

quartz mass = 22.76 (gm) density = 2.55 (gm/cc)
SiO2
G = -371038.80 (J) H = -321791.57 (J) S = 45.89 (J/K) V = 8.92 (cc) Cp = 26.51 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.67 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.74Mg0.08Fe'"0.19Al0.08Ti0.86O3
G = -6823.15 (J) H = -5430.35 (J) S = 1.30 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.88 | 9.65 | 74.33 | 4.03 | 4.10 |

Total solids mass = 78.11 (gm) density = 2.68 (gm/cc)
G = -1229570.65 (J) H = -1055353.08 (J) S = 162.34 (J/K) V = 29.17 (cc) Cp = 92.19 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.59 (gm/cc)
G = -1581605.64 (J) H = -1347872.12 (J) S = 217.80 (J/K) V = 38.52 (cc) Cp = 121.54 (J/K)

Oxygen delta moles = -0.00141271 delta grams = -0.0452052
G = 337.31 (J) H = -35.68 (J) S = -0.35 (J/K) V = -126.05 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 790.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = 0.09 COH = 1.43 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 20.19 (gm) density = 2.33 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -325487.86 (J) H = -270706.83 (J) S = 51.53 (J/K) V = 8.68 (cc) Cp = 27.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.60 | 0.27 | 13.30 | 0.26 | 0.00 | 0.77 | 0.43 | 0.12 | 0.00 | 0.00 | 1.82 | 2.57 | 5.39 | 0.50 | 4.97 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.76 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.78Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -109676.56 (J) H = -91625.73 (J) S = 16.98 (J/K) V = 2.42 (cc) Cp = 9.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.85 | 97.71 | 113.05 | 4.69 | -4.56 | 6.78 | 0.19 |

feldspar mass = 41.21 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.68Ca0.23Al1.23Si2.77O8
G = -667521.54 (J) H = -574218.15 (J) S = 87.76 (J/K) V = 15.82 (cc) Cp = 49.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.41 | 22.69 | 8.89 |

feldspar mass = 5.75 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -90245.04 (J) H = -77446.34 (J) S = 12.04 (J/K) V = 2.27 (cc) Cp = 6.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.02 | 1.97 | 67.00 |

quartz mass = 23.30 (gm) density = 2.55 (gm/cc)
SiO2
G = -379467.17 (J) H = -329779.00 (J) S = 46.74 (J/K) V = 9.14 (cc) Cp = 27.11 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.67 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.75Mg0.08Fe'''0.19Al0.08Ti0.87O3
G = -7024.60 (J) H = -5608.72 (J) S = 1.33 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.78 | 9.44 | 74.64 | 4.08 | 4.06 |

Total solids mass = 79.76 (gm) density = 2.68 (gm/cc)
G = -1253934.89 (J) H = -1078677.94 (J) S = 164.85 (J/K) V = 29.80 (cc) Cp = 94.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1579422.75 (J) H = -1349384.76 (J) S = 216.37 (J/K) V = 38.48 (cc) Cp = 121.31 (J/K)

Oxygen delta moles = -0.00143562 delta grams = -0.0459381
G = 339.25 (J) H = -35.76 (J) S = -0.35 (J/K) V = -126.90 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 780.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = 0.08 COH = 1.40 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 18.63 (gm) density = 2.32 (gm/cc) viscosity = 5.63 (log 10 poise) (analysis in wt %)
G = -300304.59 (J) H = -249950.22 (J) S = 47.81 (J/K) V = 8.03 (cc) Cp = 25.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.20 | 0.24 | 13.30 | 0.26 | 0.00 | 0.74 | 0.46 | 0.12 | 0.00 | 0.00 | 1.86 | 2.64 | 5.26 | 0.54 | 5.39 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.79 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.78Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -109888.68 (J) H = -92040.58 (J) S = 16.95 (J/K) V = 2.43 (cc) Cp = 9.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.14 | 97.79 | 113.24 | 4.78 | -4.65 | 6.79 | 0.19 |

feldspar mass = 41.07 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -664542.97 (J) H = -572936.85 (J) S = 86.98 (J/K) V = 15.75 (cc) Cp = 49.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.54 | 23.02 | 8.44 |

feldspar mass = 6.88 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.02Al1.02Si2.98O8
G = -107742.93 (J) H = -92669.45 (J) S = 14.31 (J/K) V = 2.71 (cc) Cp = 8.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.12 | 1.84 | 68.04 |

quartz mass = 23.83 (gm) density = 2.55 (gm/cc)
SiO2
G = -387582.10 (J) H = -337522.70 (J) S = 47.53 (J/K) V = 9.34 (cc) Cp = 27.70 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.67 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.75Mg0.08Fe'''0.18Al0.08Ti0.87O3
G = -7193.25 (J) H = -5761.86 (J) S = 1.36 (J/K) V = 0.16 (cc) Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.68 | 9.22 | 74.97 | 4.11 | 4.02 |

Total solids mass = 81.33 (gm) density = 2.68 (gm/cc)
G = -1276949.92 (J) H = -1100931.45 (J) S = 167.14 (J/K) V = 30.40 (cc) Cp = 95.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1577254.51 (J) H = -1350881.67 (J) S = 214.95 (J/K) V = 38.43 (cc) Cp = 121.12 (J/K)

Oxygen delta moles = -0.00145782 delta grams = -0.0466486
G = 340.92 (J) H = -35.80 (J) S = -0.36 (J/K) V = -127.65 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 770.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = 0.07 COH = 1.37 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 17.12 (gm) density = 2.31 (gm/cc) viscosity = 5.43 (log 10 poise) (analysis in wt %)
G = -276203.75 (J) H = -230017.61 (J) S = 44.28 (J/K) V = 7.41 (cc) Cp = 23.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.71 | 0.22 | 13.31 | 0.25 | 0.00 | 0.72 | 0.50 | 0.11 | 0.00 | 0.00 | 1.90 | 2.72 | 5.12 | 0.59 | 5.86 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.82 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.77Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -110070.59 (J) H = -92431.53 (J) S = 16.91 (J/K) V = 2.44 (cc) Cp = 9.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.42 | 97.88 | 113.42 | 4.87 | -4.75 | 6.81 | 0.18 |

feldspar mass = 40.97 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -662201.59 (J) H = -572192.07 (J) S = 86.29 (J/K) V = 15.70 (cc) Cp = 49.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.66 | 23.32 | 8.02 |

feldspar mass = 7.92 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -123807.42 (J) H = -106724.07 (J) S = 16.38 (J/K) V = 3.12 (cc) Cp = 9.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.25 | 1.72 | 69.04 |

quartz mass = 24.35 (gm) density = 2.55 (gm/cc)
SiO2
G = -395483.78 (J) H = -345108.31 (J) S = 48.29 (J/K) V = 9.54 (cc) Cp = 28.26 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.68 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.75Mg0.08Fe'"0.18Al0.08Ti0.87O3
G = -7333.79 (J) H = -5893.30 (J) S = 1.38 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.58 | 9.01 | 75.30 | 4.13 | 3.98 |

Total solids mass = 82.83 (gm) density = 2.67 (gm/cc)
G = -1298897.16 (J) H = -1122349.28 (J) S = 169.24 (J/K) V = 30.97 (cc) Cp = 97.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1575100.91 (J) H = -1352366.89 (J) S = 213.52 (J/K) V = 38.38 (cc) Cp = 120.98 (J/K)

Oxygen delta moles = -0.00147934 delta grams = -0.0473371
G = 342.33 (J) H = -35.81 (J) S = -0.36 (J/K) V = -128.30 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 760.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = 0.07 COH = 1.34 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 15.67 (gm) density = 2.30 (gm/cc) viscosity = 5.20 (log 10 poise) (analysis in wt %)
G = -252888.71 (J) H = -210662.21 (J) S = 40.87 (J/K) V = 6.81 (cc) Cp = 21.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.12 | 0.19 | 13.32 | 0.25 | 0.00 | 0.69 | 0.54 | 0.11 | 0.00 | 0.00 | 1.94 | 2.82 | 4.96 | 0.64 | 6.40 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.85 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.77Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -110228.65 (J) H = -92803.74 (J) S = 16.87 (J/K) V = 2.44 (cc) Cp = 9.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.70 | 97.98 | 113.58 | 4.97 | -4.86 | 6.85 | 0.18 |

feldspar mass = 40.90 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.24Al1.24Si2.76O8
G = -660397.83 (J) H = -571901.90 (J) S = 85.66 (J/K) V = 15.67 (cc) Cp = 49.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.79 | 23.59 | 7.62 |

feldspar mass = 8.89 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.28Ca0.02Al1.02Si2.98O8
G = -138711.92 (J) H = -119838.14 (J) S = 18.27 (J/K) V = 3.51 (cc) Cp = 10.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.39 | 1.60 | 70.01 |

quartz mass = 24.86 (gm) density = 2.55 (gm/cc)
SiO2
G = -403284.57 (J) H = -352632.85 (J) S = 49.03 (J/K) V = 9.74 (cc) Cp = 28.82 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.68 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.76Mg0.07Fe'"0.18Al0.08Ti0.87O3
G = -7450.28 (J) H = -6006.09 (J) S = 1.40 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.47 | 8.80 | 75.66 | 4.13 | 3.94 |

Total solids mass = 84.28 (gm) density = 2.67 (gm/cc)
G = -1320073.26 (J) H = -1143182.72 (J) S = 171.21 (J/K) V = 31.53 (cc) Cp = 99.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1572961.97 (J) H = -1353844.92 (J) S = 212.09 (J/K) V = 38.34 (cc) Cp = 120.89 (J/K)

Oxygen delta moles = -0.00150019 delta grams = -0.0480044
G = 343.48 (J) H = -35.79 (J) S = -0.37 (J/K) V = -128.87 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 750.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = 0.06 COH = 1.30 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 14.11 (gm) density = 2.29 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -227827.31 (J) H = -189688.13 (J) S = 37.28 (J/K) V = 6.17 (cc) Cp = 19.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.48 | 0.16 | 13.08 | 0.25 | 0.00 | 0.67 | 0.60 | 0.11 | 0.00 | 0.00 | 2.04 | 3.08 | 4.72 | 0.71 | 7.11 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.92 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.65Mg0.19)3Al2Si3O12
G = -12056.12 (J) H = -10324.39 (J) S = 1.69 (J/K) V = 0.23 (cc) Cp = 0.97 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.67 | 16.73 | 18.60 |

orthopyroxene mass = 8.25 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.12Mg0.80Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -103130.01 (J) H = -87115.67 (J) S = 15.65 (J/K) V = 2.28 (cc) Cp = 9.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.32 | 97.95 | 111.64 | 4.77 | -4.66 | 6.44 | 0.18 |

feldspar mass = 40.40 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.69Ca0.23Al1.23Si2.77O8
G = -651480.22 (J) H = -565405.08 (J) S = 84.13 (J/K) V = 15.47 (cc) Cp = 49.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.22 | 23.45 | 7.33 |

feldspar mass = 9.95 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -155018.83 (J) H = -134222.31 (J) S = 20.33 (J/K) V = 3.92 (cc) Cp = 11.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.81 | 1.49 | 70.71 |

quartz mass = 25.53 (gm) density = 2.55 (gm/cc)
SiO2
G = -413768.81 (J) H = -362535.23 (J) S = 50.07 (J/K) V = 10.01 (cc) Cp = 29.56 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.08Fe'"0.17Al0.08Ti0.88O3
G = -7540.37 (J) H = -6100.07 (J) S = 1.41 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.67 | 8.41 | 75.93 | 4.18 | 3.82 |

Total solids mass = 85.84 (gm) density = 2.68 (gm/cc)
G = -1342994.37 (J) H = -1165702.76 (J) S = 173.28 (J/K) V = 32.09 (cc) Cp = 101.47 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1570821.68 (J) H = -1355390.89 (J) S = 210.56 (J/K) V = 38.25 (cc) Cp = 120.81 (J/K)

Oxygen delta moles = -0.00155208 delta grams = -0.0496645
G = 351.56 (J) H = -36.49 (J) S = -0.38 (J/K) V = -132.03 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 740.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = 0.05 COH = 1.27 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 12.52 (gm) density = 2.27 (gm/cc) viscosity = 4.48 (log 10 poise) (analysis in wt %)
G = -202527.38 (J) H = -168413.73 (J) S = 33.67 (J/K) V = 5.52 (cc) Cp = 17.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.60 | 0.14 | 12.81 | 0.24 | 0.00 | 0.64 | 0.67 | 0.11 | 0.00 | 0.00 | 2.15 | 3.41 | 4.42 | 0.80 | 8.01 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.87 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.64Mg0.19)3Al2Si3O12
G = -24520.03 (J) H = -21053.21 (J) S = 3.42 (J/K) V = 0.47 (cc) Cp = 1.98 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.01 | 17.21 | 18.78 |

orthopyroxene mass = 7.64 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.82Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -95874.74 (J) H = -81261.74 (J) S = 14.42 (J/K) V = 2.12 (cc) Cp = 8.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.61 | 97.92 | 109.40 | 4.55 | -4.45 | 6.02 | 0.18 |

feldspar mass = 39.89 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -642647.80 (J) H = -558946.95 (J) S = 82.61 (J/K) V = 15.28 (cc) Cp = 49.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.68 | 23.25 | 7.06 |

feldspar mass = 10.98 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.01Al1.01Si2.99O8
G = -170777.27 (J) H = -148192.70 (J) S = 22.29 (J/K) V = 4.33 (cc) Cp = 12.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.25 | 1.38 | 71.37 |

quartz mass = 26.24 (gm) density = 2.55 (gm/cc)
SiO2
G = -424738.87 (J) H = -372900.23 (J) S = 51.17 (J/K) V = 10.29 (cc) Cp = 30.35 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.08Fe'"0.16Al0.07Ti0.88O3
G = -7612.10 (J) H = -6179.94 (J) S = 1.41 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.91 | 8.01 | 76.19 | 4.20 | 3.69 |

Total solids mass = 87.42 (gm) density = 2.68 (gm/cc)
G = -1366170.81 (J) H = -1188534.77 (J) S = 175.33 (J/K) V = 32.65 (cc) Cp = 103.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1568698.20 (J) H = -1356948.50 (J) S = 209.00 (J/K) V = 38.17 (cc) Cp = 120.83 (J/K)

Oxygen delta moles = -0.0016014 delta grams = -0.0512428
G = 358.82 (J) H = -37.09 (J) S = -0.39 (J/K) V = -134.90 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 730.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = 0.04 COH = 1.24 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 9.96 (gm) density = 2.24 (gm/cc) viscosity = 3.78 (log 10 poise) (analysis in wt %)
G = -161186.27 (J) H = -133468.97 (J) S = 27.63 (J/K) V = 4.44 (cc) Cp = 13.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.10 | 0.10 | 11.78 | 0.30 | 0.00 | 0.74 | 0.84 | 0.10 | 0.00 | 0.00 | 2.45 | 4.27 | 3.83 | 1.01 | 9.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.61 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.65Mg0.17)3Al2Si3O12
G = -60122.10 (J) H = -51734.01 (J) S = 8.36 (J/K) V = 1.15 (cc) Cp = 4.85 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.77 | 18.47 | 16.76 |

orthopyroxene mass = 4.78 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.78Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -59257.31 (J) H = -50271.12 (J) S = 8.96 (J/K) V = 1.32 (cc) Cp = 5.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.00 | 97.85 | 114.19 | 4.15 | -4.07 | 5.70 | 0.18 |

biotite mass = 1.38 (gm) density = 2.81 (gm/cc) (analysis in mole %)
K(Fe"0.12Mg0.88)3AlSi3O10(OH)2
G = -21107.57 (J) H = -18194.56 (J) S = 2.90 (J/K) V = 0.49 (cc) Cp = 1.70 (J/K)

| annite | phlogopite |
|---|---|
| 12.35 | 87.65 |

feldspar mass = 39.04 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -627962.51 (J) H = -547294.62 (J) S = 80.41 (J/K) V = 14.96 (cc) Cp = 48.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.00 | 21.94 | 7.05 |

feldspar mass = 11.24 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.01Al1.01Si2.99O8
G = -174578.84 (J) H = -151820.89 (J) S = 22.69 (J/K) V = 4.43 (cc) Cp = 13.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.35 | 1.26 | 71.39 |

quartz mass = 28.13 (gm) density = 2.55 (gm/cc)
SiO2
G = -454661.52 (J) H = -399975.91 (J) S = 54.51 (J/K) V = 11.03 (cc) Cp = 32.48 (J/K)

rhm-oxide mass = 0.82 (gm) density = 4.69 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.07Fe'"0.17Al0.07Ti0.88O3
G = -7725.20 (J) H = -6283.08 (J) S = 1.44 (J/K) V = 0.18 (cc) Cp = 0.75 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.12 | 8.36 | 76.99 | 4.20 | 3.32 |

Total solids mass = 89.99 (gm) density = 2.68 (gm/cc)
G = -1405415.06 (J) H = -1225574.20 (J) S = 179.28 (J/K) V = 33.55 (cc) Cp = 106.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1566601.33 (J) H = -1359043.17 (J) S = 206.91 (J/K) V = 37.99 (cc) Cp = 120.74 (J/K)

Oxygen delta moles = -0.00163507 delta grams = -0.0523203
G = 362.38 (J) H = -37.30 (J) S = -0.40 (J/K) V = -136.37 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.26 (log 10 poise)  (analysis in wt %)
G = -1704928.92 (J)  H = -1261684.95 (J)  S = 281.76 (J/K)  V = 41.23 (cc)  Cp = 142.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.63 | 0.00 | 3.03 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.26 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1704928.92 (J)  H = -1261684.95 (J)  S = 281.76 (J/K)  V = 41.23 (cc)  Cp = 142.57 (J/K)

Oxygen  delta moles = 5.41234e-16  delta grams = 1.73188e-14
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.32 (log 10 poise)  (analysis in wt %)
G = -1702117.15 (J)  H = -1263111.62 (J)  S = 280.85 (J/K)  V = 41.20 (cc)  Cp = 142.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.63 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.32 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1702117.15 (J)  H = -1263111.62 (J)  S = 280.85 (J/K)  V = 41.20 (cc)  Cp = 142.56 (J/K)

Oxygen  delta moles = 2.31194e-06  delta grams = 7.39794e-05
G = -0.84 (J)  H = 0.10 (J)  S = 0.00 (J/K)  V = 0.30 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.38 (log 10 poise)  (analysis in wt %)
G = -1699314.65 (J)  H = -1264538.33 (J)  S = 279.93 (J/K)  V = 41.17 (cc)  Cp = 142.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.63 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.38 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1699314.65 (J)  H = -1264538.33 (J)  S = 279.93 (J/K)  V = 41.17 (cc)  Cp = 142.55 (J/K)

Oxygen  delta moles = 4.88656e-06  delta grams = 0.000156364
G = -1.76 (J)  H = 0.21 (J)  S = 0.00 (J/K)  V = 0.63 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.44 (log 10 poise)  (analysis in wt %)
G = -1696521.46 (J)  H = -1265965.09 (J)  S = 279.01 (J/K)  V = 41.14 (cc)  Cp = 142.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.63 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.44 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1696521.46 (J)  H = -1265965.09 (J)  S = 279.01 (J/K)  V = 41.14 (cc)  Cp = 142.54 (J/K)

Oxygen  delta moles = 7.73123e-06  delta grams = 0.00024739
G = -2.76 (J)  H = 0.33 (J)  S = 0.00 (J/K)  V = 0.99 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1693737.66 (J)  H = -1267391.91 (J)  S = 278.08 (J/K)  V = 41.11 (cc)  Cp = 142.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.63 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1693737.66 (J)  H = -1267391.91 (J)  S = 278.08 (J/K)  V = 41.11 (cc)  Cp = 142.54 (J/K)

Oxygen  delta moles = 1.08537e-05  delta grams = 0.000347304
G = -3.85 (J)  H = 0.45 (J)  S = 0.00 (J/K)  V = 1.38 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.56 (log 10 poise)  (analysis in wt %)
G = -1690963.31 (J)  H = -1268818.80 (J)  S = 277.15 (J/K)  V = 41.08 (cc)  Cp = 142.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.63 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1690963.31 (J)  H = -1268818.80 (J)  S = 277.15 (J/K)  V = 41.08 (cc)  Cp = 142.53 (J/K)

Oxygen  delta moles = 1.42619e-05  delta grams = 0.000456364
G = -5.03 (J)  H = 0.59 (J)  S = 0.00 (J/K)  V = 1.81 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.63 (log 10 poise) (analysis in wt %)
G = -1688198.47 (J) H = -1270245.75 (J) S = 276.21 (J/K) V = 41.05 (cc) Cp = 142.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.64 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.63 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1688198.47 (J) H = -1270245.75 (J) S = 276.21 (J/K) V = 41.05 (cc) Cp = 142.52 (J/K)

Oxygen delta moles = 1.79643e-05 delta grams = 0.000574836
G = -6.29 (J) H = 0.74 (J) S = 0.00 (J/K) V = 2.26 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -1685443.20 (J) H = -1271672.79 (J) S = 275.27 (J/K) V = 41.02 (cc) Cp = 142.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.64 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.69 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1685443.20 (J) H = -1271672.79 (J) S = 275.27 (J/K) V = 41.02 (cc) Cp = 142.51 (J/K)

Oxygen delta moles = 2.19696e-05 delta grams = 0.000703001
G = -7.63 (J) H = 0.89 (J) S = 0.01 (J/K) V = 2.75 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1682697.58 (J) H = -1273099.90 (J) S = 274.32 (J/K) V = 40.99 (cc) Cp = 142.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.64 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1682697.58 (J) H = -1273099.90 (J) S = 274.32 (J/K) V = 40.99 (cc) Cp = 142.51 (J/K)

Oxygen delta moles = 2.62869e-05 delta grams = 0.000841149
G = -9.06 (J) H = 1.06 (J) S = 0.01 (J/K) V = 3.26 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1679961.68 (J) H = -1274527.10 (J) S = 273.36 (J/K) V = 40.97 (cc) Cp = 142.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.64 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1679961.68 (J) H = -1274527.10 (J) S = 273.36 (J/K) V = 40.97 (cc) Cp = 142.50 (J/K)

Oxygen delta moles = 3.09257e-05 delta grams = 0.000989584
G = -10.58 (J) H = 1.24 (J) S = 0.01 (J/K) V = 3.81 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.89 (log 10 poise) (analysis in wt %)
G = -1677235.42 (J) H = -1275900.23 (J) S = 272.43 (J/K) V = 40.94 (cc) Cp = 134.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.64 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.89 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1677235.42 (J) H = -1275900.23 (J) S = 272.43 (J/K) V = 40.94 (cc) Cp = 134.58 (J/K)

Oxygen delta moles = 3.58958e-05 delta grams = 0.00114862
G = -12.19 (J) H = 1.42 (J) S = 0.01 (J/K) V = 4.40 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1674518.51 (J) H = -1277248.39 (J) S = 271.52 (J/K) V = 40.91 (cc) Cp = 134.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.64 | 0.00 | 3.01 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1674518.51 (J) H = -1277248.39 (J) S = 271.52 (J/K) V = 40.91 (cc) Cp = 134.55 (J/K)

Oxygen delta moles = 4.12078e-05 delta grams = 0.0013186
G = -13.89 (J) H = 1.62 (J) S = 0.01 (J/K) V = 5.01 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1671810.98 (J) H = -1278596.45 (J) S = 270.59 (J/K) V = 40.88 (cc) Cp = 134.53 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.64 0.00 3.01 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1671810.98 (J) H = -1278596.45 (J) S = 270.59 (J/K) V = 40.88 (cc) Cp = 134.53 (J/K)

Oxygen delta moles = 4.68723e-05 delta grams = 0.00149986
G = -15.67 (J) H = 1.82 (J) S = 0.01 (J/K) V = 5.66 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1669112.90 (J) H = -1279944.42 (J) S = 269.67 (J/K) V = 40.85 (cc) Cp = 134.50 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.65 0.00 3.01 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1669112.90 (J) H = -1279944.42 (J) S = 269.67 (J/K) V = 40.85 (cc) Cp = 134.50 (J/K)

Oxygen delta moles = 5.29007e-05 delta grams = 0.00169276
G = -17.56 (J) H = 2.04 (J) S = 0.01 (J/K) V = 6.35 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1666424.32 (J) H = -1281292.29 (J) S = 268.73 (J/K) V = 40.82 (cc) Cp = 134.47 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

71.09 0.40 13.66 0.65 0.00 3.01 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1666424.32 (J) H = -1281292.29 (J) S = 268.73 (J/K) V = 40.82 (cc) Cp = 134.47 (J/K)

Oxygen delta moles = 5.93049e-05 delta grams = 0.00189768
G = -19.53 (J) H = 2.26 (J) S = 0.02 (J/K) V = 7.07 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1663745.34 (J) H = -1282640.05 (J) S = 267.79 (J/K) V = 40.79 (cc) Cp = 134.44 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.65 0.00 3.01 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1663745.34 (J) H = -1282640.05 (J) S = 267.79 (J/K) V = 40.79 (cc) Cp = 134.44 (J/K)

Oxygen delta moles = 6.60971e-05 delta grams = 0.00211503
G = -21.60 (J) H = 2.50 (J) S = 0.02 (J/K) V = 7.82 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1140.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.26 COH = 2.13 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -1661076.01 (J) H = -1283987.70 (J) S = 266.84 (J/K) V = 40.77 (cc) Cp = 134.41 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.65 0.00 3.00 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1661076.01 (J) H = -1283987.70 (J) S = 266.84 (J/K) V = 40.77 (cc) Cp = 134.41 (J/K)

Oxygen delta moles = 7.32902e-05 delta grams = 0.0023452
G = -23.76 (J) H = 2.74 (J) S = 0.02 (J/K) V = 8.61 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1658416.40 (J) H = -1285335.23 (J) S = 265.89 (J/K) V = 40.74 (cc) Cp = 134.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1658416.40 (J) H = -1285335.23 (J) S = 265.89 (J/K) V = 40.74 (cc) Cp = 134.37 (J/K)

Oxygen delta moles = 8.08979e-05 delta grams = 0.00258864
G = -26.02 (J) H = 3.00 (J) S = 0.02 (J/K) V = 9.44 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1120.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.25 COH = 2.09 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.45 (log 10 poise) (analysis in wt %)
G = -1655766.59 (J) H = -1286682.64 (J) S = 264.93 (J/K) V = 40.71 (cc) Cp = 134.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1655766.59 (J)  H = -1286682.64 (J)  S = 264.93 (J/K)  V = 40.71 (cc)  Cp = 134.34 (J/K)

Oxygen  delta moles = 8.89343e-05  delta grams = 0.00284579
G = -28.37 (J)  H = 3.26 (J)  S = 0.02 (J/K)  V = 10.30 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1110.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.24  COH = 2.07  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 5.53 (log 10 poise)  (analysis in wt %)
G = -1653126.65 (J)  H = -1288029.93 (J)  S = 263.96 (J/K)  V = 40.68 (cc)  Cp = 134.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.66 | 0.00 | 3.00 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.53 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1653126.65 (J)  H = -1288029.93 (J)  S = 263.96 (J/K)  V = 40.68 (cc)  Cp = 134.30 (J/K)

Oxygen  delta moles = 9.74141e-05  delta grams = 0.00311714
G = -30.83 (J)  H = 3.54 (J)  S = 0.02 (J/K)  V = 11.20 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1100.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.23  COH = 2.05  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.57 (gm)  density = 2.46 (gm/cc)  viscosity = 5.63 (log 10 poise)  (analysis in wt %)
G = -1644124.42 (J)  H = -1284522.67 (J)  S = 261.88 (J/K)  V = 40.51 (cc)  Cp = 133.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.17 | 0.40 | 13.71 | 0.65 | 0.00 | 2.93 | 0.10 | 1.10 | 0.00 | 0.00 | 2.40 | 4.01 | 2.41 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.43 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.60Mg1.30Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -6353.00 (J)  H = -4999.19 (J)  S = 0.99 (J/K)  V = 0.13 (cc)  Cp = 0.52 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-62.76 96.37 60.39 3.60 -3.44 5.51 0.33

Total solids mass = 0.43 (gm) density = 3.37 (gm/cc)
G = -6353.00 (J) H = -4999.19 (J) S = 0.99 (J/K) V = 0.13 (cc) Cp = 0.52 (J/K)

Viscosity of the System: 5.63 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1650477.42 (J) H = -1289521.86 (J) S = 262.87 (J/K) V = 40.63 (cc) Cp = 134.13 (J/K)

Oxygen delta moles = 6.98818e-05 delta grams = 0.00223613
G = -21.94 (J) H = 2.51 (J) S = 0.02 (J/K) V = 7.98 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 99.19 (gm) density = 2.46 (gm/cc) viscosity = 5.73 (log 10 poise) (analysis in wt %)
G = -1635877.09 (J) H = -1281567.07 (J) S = 259.92 (J/K) V = 40.35 (cc) Cp = 132.99 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.24 0.40 13.76 0.64 0.00 2.87 0.10 1.01 0.00 0.00 2.41 4.02 2.42 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.81 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.63Mg1.28Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -11962.53 (J) H = -9427.88 (J) S = 1.86 (J/K) V = 0.24 (cc) Cp = 0.98 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-64.99 96.23 62.60 3.71 -3.55 5.66 0.34

Total solids mass = 0.81 (gm) density = 3.38 (gm/cc)
G = -11962.53 (J) H = -9427.88 (J) S = 1.86 (J/K) V = 0.24 (cc) Cp = 0.98 (J/K)

Viscosity of the System: 5.74 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1647839.62 (J) H = -1290994.94 (J) S = 261.78 (J/K) V = 40.59 (cc) Cp = 133.97 (J/K)

Oxygen delta moles = 4.33891e-05 delta grams = 0.0013884
G = -13.51 (J) H = 1.54 (J) S = 0.01 (J/K) V = 4.92 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1080.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.22 COH = 2.01 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 98.81 (gm) density = 2.46 (gm/cc) viscosity = 5.84 (log 10 poise) (analysis in wt %)
G = -1627810.95 (J) H = -1278727.50 (J) S = 257.98 (J/K) V = 40.19 (cc) Cp = 132.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.32 | 0.41 | 13.80 | 0.63 | 0.00 | 2.81 | 0.10 | 0.94 | 0.00 | 0.00 | 2.42 | 4.04 | 2.43 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.19 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.65Mg1.25Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -17400.64 (J) H = -13734.86 (J) S = 2.71 (J/K) V = 0.35 (cc) Cp = 1.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.26 | 96.09 | 64.84 | 3.83 | -3.67 | 5.82 | 0.35 |

Total solids mass = 1.19 (gm) density = 3.39 (gm/cc)
G = -17400.64 (J) H = -13734.86 (J) S = 2.71 (J/K) V = 0.35 (cc) Cp = 1.43 (J/K)

Viscosity of the System: 5.85 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1645211.60 (J) H = -1292462.36 (J) S = 260.69 (J/K) V = 40.55 (cc) Cp = 133.81 (J/K)

Oxygen delta moles = 1.47961e-05 delta grams = 0.000473459
G = -4.57 (J) H = 0.52 (J) S = 0.00 (J/K) V = 1.66 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1070.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.22 COH = 1.99 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 98.44 (gm) density = 2.46 (gm/cc) viscosity = 5.94 (log 10 poise) (analysis in wt %)
G = -1619913.63 (J) H = -1275995.10 (J) S = 256.05 (J/K) V = 40.04 (cc) Cp = 131.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.39 | 0.41 | 13.84 | 0.62 | 0.00 | 2.74 | 0.10 | 0.86 | 0.00 | 0.00 | 2.42 | 4.06 | 2.44 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.56 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.67Mg1.22Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -22679.71 (J) H = -17929.33 (J) S = 3.54 (J/K) V = 0.46 (cc) Cp = 1.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.58 | 95.95 | 67.11 | 3.96 | -3.80 | 5.99 | 0.36 |

Total solids mass = 1.56 (gm) density = 3.40 (gm/cc)
G = -22679.71 (J) H = -17929.33 (J) S = 3.54 (J/K) V = 0.46 (cc) Cp = 1.87 (J/K)

Viscosity of the System: 5.96 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1642593.34 (J) H = -1293924.42 (J) S = 259.59 (J/K) V = 40.50 (cc) Cp = 133.66 (J/K)

Oxygen delta moles = -1.59848e-05 delta grams = -0.000511494

G = 4.90 (J)  H = -0.56 (J)  S = -0.00 (J/K)  V = -1.79 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1060.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.21  COH = 1.97  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.07 (gm)  density = 2.46 (gm/cc)  viscosity = 6.05 (log 10 poise)  (analysis in wt %)
G = -1612174.46 (J)  H = -1273362.16 (J)  S = 254.14 (J/K)  V = 39.89 (cc)  Cp = 131.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.47 | 0.41 | 13.88 | 0.61 | 0.00 | 2.66 | 0.10 | 0.79 | 0.00 | 0.00 | 2.43 | 4.07 | 2.44 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.93 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.69Mg1.20Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -27810.42 (J)  H = -22019.27 (J)  S = 4.34 (J/K)  V = 0.56 (cc)  Cp = 2.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.94 | 95.82 | 69.41 | 4.10 | -3.94 | 6.17 | 0.37 |

Total solids  mass = 1.93 (gm)  density = 3.41 (gm/cc)
G = -27810.42 (J)  H = -22019.27 (J)  S = 4.34 (J/K)  V = 0.56 (cc)  Cp = 2.30 (J/K)

Viscosity of the System: 6.07 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1639984.88 (J)  H = -1295381.42 (J)  S = 258.49 (J/K)  V = 40.46 (cc)  Cp = 133.50 (J/K)

Oxygen  delta moles = -4.9023e-05  delta grams = -0.00156868
G = 14.89 (J)  H = -1.69 (J)  S = -0.01 (J/K)  V = -5.43 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1050.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.20  COH = 1.95  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.94 (gm)  density = 2.46 (gm/cc)  viscosity = 6.16 (log 10 poise)  (analysis in wt %)
G = -1575245.27 (J)  H = -1247502.85 (J)  S = 247.70 (J/K)  V = 39.05 (cc)  Cp = 128.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.75 | 0.42 | 13.76 | 0.60 | 0.00 | 2.61 | 0.10 | 0.72 | 0.00 | 0.00 | 2.38 | 4.02 | 2.49 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.39 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.72Mg1.17Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -34268.53 (J)  H = -27165.76 (J)  S = 5.37 (J/K)  V = 0.70 (cc)  Cp = 2.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.10 | 95.83 | 72.45 | 4.15 | -3.99 | 6.28 | 0.38 |

feldspar mass = 1.66 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.26Al1.26Si2.74O8
G = -27862.94 (J) H = -22613.96 (J) S = 3.97 (J/K) V = 0.64 (cc) Cp = 2.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.17 | 26.44 | 3.39 |

Total solids mass = 4.05 (gm) density = 3.03 (gm/cc)
G = -62131.47 (J) H = -49779.72 (J) S = 9.34 (J/K) V = 1.34 (cc) Cp = 4.87 (J/K)

Viscosity of the System: 6.22 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1637376.74 (J) H = -1297282.57 (J) S = 257.03 (J/K) V = 40.39 (cc) Cp = 133.03 (J/K)

Oxygen delta moles = -0.000103686 delta grams = -0.00331783
G = 31.23 (J) H = -3.54 (J) S = -0.03 (J/K) V = -11.41 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1040.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.93 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 90.25 (gm) density = 2.45 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -1479184.36 (J) H = -1174000.97 (J) S = 232.41 (J/K) V = 36.77 (cc) Cp = 120.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.88 | 0.44 | 13.62 | 0.60 | 0.00 | 2.60 | 0.11 | 0.65 | 0.00 | 0.00 | 2.30 | 3.93 | 2.62 | 0.11 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.01 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.76Mg1.13Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -42624.78 (J) H = -33819.13 (J) S = 6.71 (J/K) V = 0.87 (cc) Cp = 3.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.20 | 95.95 | 76.30 | 4.20 | -4.03 | 6.41 | 0.37 |

feldspar mass = 5.39 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.26Al1.26Si2.74O8
G = -90324.94 (J) H = -73471.36 (J) S = 12.83 (J/K) V = 2.07 (cc) Cp = 6.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.55 | 25.82 | 3.63 |

quartz mass = 1.35 (gm) density = 2.55 (gm/cc)
SiO2
G = -22637.77 (J) H = -18643.69 (J) S = 3.04 (J/K) V = 0.53 (cc) Cp = 1.61 (J/K)

Total solids mass = 9.74 (gm) density = 2.80 (gm/cc)
G = -155587.49 (J) H = -125934.18 (J) S = 22.58 (J/K) V = 3.47 (cc) Cp = 11.74 (J/K)

Viscosity of the System: 6.37 (log 10 poise)

System mass = 99.99 (gm) density = 2.48 (gm/cc)
G = -1634771.85 (J) H = -1299935.15 (J) S = 254.99 (J/K) V = 40.25 (cc) Cp = 132.12 (J/K)

Oxygen delta moles = -0.000184894 delta grams = -0.00591637
G = 55.23 (J) H = -6.25 (J) S = -0.05 (J/K) V = -20.19 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1030.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.19 COH = 1.91 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 83.46 (gm) density = 2.45 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -1365288.57 (J) H = -1085648.58 (J) S = 214.59 (J/K) V = 34.04 (cc) Cp = 111.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.79 | 0.48 | 13.58 | 0.61 | 0.00 | 2.61 | 0.12 | 0.59 | 0.00 | 0.00 | 2.24 | 3.86 | 2.79 | 0.12 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.64 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.80Mg1.09Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -50999.64 (J) H = -40498.07 (J) S = 8.06 (J/K) V = 1.05 (cc) Cp = 4.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.42 | 96.06 | 80.20 | 4.28 | -4.11 | 6.62 | 0.36 |

feldspar mass = 9.35 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -156499.23 (J) H = -127582.41 (J) S = 22.19 (J/K) V = 3.60 (cc) Cp = 11.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.71 | 25.35 | 3.94 |

quartz mass = 3.54 (gm) density = 2.55 (gm/cc)
SiO2
G = -59398.02 (J) H = -49026.05 (J) S = 7.96 (J/K) V = 1.39 (cc) Cp = 4.22 (J/K)

Total solids mass = 16.53 (gm) density = 2.74 (gm/cc)
G = -266896.90 (J) H = -217106.52 (J) S = 38.21 (J/K) V = 6.04 (cc) Cp = 20.00 (J/K)

Viscosity of the System: 6.53 (log 10 poise)

System mass = 99.99 (gm) density = 2.50 (gm/cc)
G = -1632185.46 (J) H = -1302755.10 (J) S = 252.80 (J/K) V = 40.07 (cc) Cp = 131.25 (J/K)

Oxygen delta moles = -0.000272749 delta grams = -0.00872765
G = 80.78 (J) H = -9.12 (J) S = -0.07 (J/K) V = -29.55 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1020.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.89 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 77.46 (gm) density = 2.45 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -1264925.05 (J) H = -1007777.55 (J) S = 198.85 (J/K) V = 31.62 (cc) Cp = 103.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.70 | 0.52 | 13.54 | 0.61 | 0.00 | 2.60 | 0.13 | 0.53 | 0.00 | 0.00 | 2.18 | 3.79 | 2.97 | 0.13 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.22 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.84Mg1.05Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -58497.51 (J) H = -46496.48 (J) S = 9.28 (J/K) V = 1.21 (cc) Cp = 4.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.43 | 96.17 | 83.90 | 4.36 | -4.18 | 6.82 | 0.36 |

feldspar mass = 12.85 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -214770.51 (J) H = -175477.94 (J) S = 30.39 (J/K) V = 4.94 (cc) Cp = 15.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.82 | 24.92 | 4.26 |

quartz mass = 5.46 (gm) density = 2.55 (gm/cc)
SiO2
G = -91427.75 (J) H = -75628.83 (J) S = 12.22 (J/K) V = 2.14 (cc) Cp = 6.50 (J/K)

Total solids mass = 22.53 (gm) density = 2.72 (gm/cc)
G = -364695.76 (J) H = -297603.25 (J) S = 51.88 (J/K) V = 8.30 (cc) Cp = 27.23 (J/K)

Viscosity of the System: 6.70 (log 10 poise)

System mass = 99.99 (gm) density = 2.50 (gm/cc)
G = -1629620.81 (J) H = -1305380.79 (J) S = 250.74 (J/K) V = 39.92 (cc) Cp = 130.41 (J/K)

Oxygen delta moles = -0.000359789 delta grams = -0.0115128
G = 105.65 (J) H = -11.90 (J) S = -0.09 (J/K) V = -38.68 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1010.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.86 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 72.12 (gm) density = 2.45 (gm/cc) viscosity = 6.24 (log 10 poise) (analysis in wt %)
G = -1175845.67 (J) H = -938641.50 (J) S = 184.86 (J/K) V = 29.47 (cc) Cp = 96.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.61 | 0.55 | 13.51 | 0.61 | 0.00 | 2.57 | 0.14 | 0.48 | 0.00 | 0.00 | 2.13 | 3.71 | 3.15 | 0.14 | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.75 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.01Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -65247.17 (J) H = -51917.54 (J) S = 10.39 (J/K) V = 1.36 (cc) Cp = 5.53 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-91.21 96.28 87.37 4.44 -4.25 7.01 0.35

feldspar mass = 15.96 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.25Al1.25Si2.75O8
G = -266426.29 (J) H = -218169.87 (J) S = 37.61 (J/K) V = 6.14 (cc) Cp = 19.61 (J/K)
albite anorthite sanidine
70.89 24.53 4.58

quartz mass = 7.15 (gm) density = 2.55 (gm/cc)
SiO2
G = -119557.80 (J) H = -99115.03 (J) S = 15.93 (J/K) V = 2.80 (cc) Cp = 8.50 (J/K)

Total solids mass = 27.87 (gm) density = 2.70 (gm/cc)
G = -451231.26 (J) H = -369202.44 (J) S = 63.93 (J/K) V = 10.30 (cc) Cp = 33.64 (J/K)

Viscosity of the System: 6.87 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1627076.93 (J) H = -1307843.94 (J) S = 248.79 (J/K) V = 39.78 (cc) Cp = 129.66 (J/K)

Oxygen delta moles = -0.000445573 delta grams = -0.0142578
G = 129.72 (J) H = -14.58 (J) S = -0.11 (J/K) V = -47.54 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 1000.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.17 COH = 1.84 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 67.33 (gm) density = 2.44 (gm/cc) viscosity = 6.25 (log 10 poise) (analysis in wt %)
G = -1096298.79 (J) H = -876879.97 (J) S = 172.34 (J/K) V = 27.55 (cc) Cp = 89.62 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.53 0.59 13.48 0.61 0.00 2.52 0.15 0.44 0.00 0.00 2.08 3.63 3.32 0.15 1.49 0.00 0.00 0.00 0.00

orthopyroxene mass = 5.25 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.98Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -71340.05 (J) H = -56834.67 (J) S = 11.39 (J/K) V = 1.50 (cc) Cp = 6.08 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-94.71 96.39 90.60 4.52 -4.31 7.18 0.34

feldspar mass = 18.75 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -312476.74 (J) H = -256451.62 (J) S = 44.01 (J/K) V = 7.21 (cc) Cp = 23.01 (J/K)
albite anorthite sanidine
70.92 24.17 4.91

quartz mass = 8.65 (gm) density = 2.55 (gm/cc)
SiO2
G = -144437.49 (J) H = -120002.85 (J) S = 19.19 (J/K) V = 3.39 (cc) Cp = 10.27 (J/K)

Total solids mass = 32.65 (gm) density = 2.70 (gm/cc)
G = -528254.27 (J) H = -433289.15 (J) S = 74.59 (J/K) V = 12.10 (cc) Cp = 39.36 (J/K)

Viscosity of the System: 7.07 (log 10 poise)

System mass = 99.98 (gm) density = 2.52 (gm/cc)
G = -1624553.06 (J) H = -1310169.12 (J) S = 246.93 (J/K) V = 39.65 (cc) Cp = 128.98 (J/K)

Oxygen delta moles = -0.000529587 delta grams = -0.0169461
G = 152.84 (J) H = -17.14 (J) S = -0.13 (J/K) V = -56.06 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 990.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.16 COH = 1.82 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 63.02 (gm) density = 2.44 (gm/cc) viscosity = 6.26 (log 10 poise) (analysis in wt %)
G = -1024892.90 (J) H = -821412.55 (J) S = 161.09 (J/K) V = 25.82 (cc) Cp = 83.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.46 | 0.63 | 13.46 | 0.60 | 0.00 | 2.46 | 0.16 | 0.40 | 0.00 | 0.00 | 2.04 | 3.55 | 3.49 | 0.16 | 1.59 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.70 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.95Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -76842.96 (J) H = -61301.49 (J) S = 12.30 (J/K) V = 1.62 (cc) Cp = 6.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.93 | 96.49 | 93.56 | 4.59 | -4.37 | 7.33 | 0.34 |

feldspar mass = 21.26 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -353730.11 (J) H = -290957.68 (J) S = 49.70 (J/K) V = 8.18 (cc) Cp = 26.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.93 | 23.84 | 5.23 |

quartz mass = 10.00 (gm) density = 2.55 (gm/cc)
SiO2
G = -166582.66 (J) H = -138704.07 (J) S = 22.07 (J/K) V = 3.91 (cc) Cp = 11.86 (J/K)

Total solids mass = 36.96 (gm) density = 2.69 (gm/cc)
G = -597155.73 (J) H = -490963.24 (J) S = 84.07 (J/K) V = 13.71 (cc) Cp = 44.49 (J/K)

Viscosity of the System: 7.29 (log 10 poise)

System mass = 99.98 (gm) density = 2.53 (gm/cc)
G = -1622048.63 (J) H = -1312375.79 (J) S = 245.16 (J/K) V = 39.54 (cc) Cp = 128.35 (J/K)

Oxygen delta moles = -0.000611314 delta grams = -0.0195613
G = 174.88 (J) H = -19.57 (J) S = -0.15 (J/K) V = -64.20 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 980.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.15  COH = 1.80  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 59.13 (gm)  density = 2.44 (gm/cc)  viscosity = 6.27 (log 10 poise)  (analysis in wt %)
G = -960501.59 (J)  H = -771364.97 (J)  S = 150.93 (J/K)  V = 24.26 (cc)  Cp = 78.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.39 | 0.67 | 13.43 | 0.58 | 0.00 | 2.38 | 0.17 | 0.36 | 0.00 | 0.00 | 2.01 | 3.47 | 3.66 | 0.17 | 1.70 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.12 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.92Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -81807.46 (J)  H = -65359.07 (J)  S = 13.13 (J/K)  V = 1.73 (cc)  Cp = 7.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.85 | 96.58 | 96.25 | 4.65 | -4.42 | 7.45 | 0.33 |

feldspar  mass = 23.53 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -390844.97 (J)  H = -322204.87 (J)  S = 54.77 (J/K)  V = 9.05 (cc)  Cp = 28.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.90 | 23.54 | 5.56 |

quartz  mass = 11.20 (gm)  density = 2.55 (gm/cc)
SiO2
G = -186409.12 (J)  H = -155550.72 (J)  S = 24.62 (J/K)  V = 4.38 (cc)  Cp = 13.27 (J/K)

Total solids  mass = 40.85 (gm)  density = 2.69 (gm/cc)
G = -659061.55 (J)  H = -543114.67 (J)  S = 92.52 (J/K)  V = 15.17 (cc)  Cp = 49.11 (J/K)

Viscosity of the System: 7.55 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.54 (gm/cc)
G = -1619563.13 (J)  H = -1314479.64 (J)  S = 243.45 (J/K)  V = 39.43 (cc)  Cp = 127.78 (J/K)

Oxygen  delta moles = -0.000690287  delta grams = -0.0220884
G = 195.74 (J)  H = -21.85 (J)  S = -0.17 (J/K)  V = -71.92 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 970.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.15  COH = 1.77  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 55.60 (gm)  density = 2.43 (gm/cc)  viscosity = 6.28 (log 10 poise)  (analysis in wt %)
G = -902196.91 (J)  H = -726017.42 (J)  S = 141.72 (J/K)  V = 22.84 (cc)  Cp = 73.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

71.31 0.72 13.42 0.57 0.00 2.29 0.18 0.33 0.00 0.00 1.98 3.39 3.83 0.18 1.80 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.50 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.90Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -86276.19 (J) H = -69040.99 (J) S = 13.86 (J/K) V = 1.84 (cc) Cp = 7.44 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.49 96.67 98.69 4.70 -4.46 7.56 0.32

feldspar mass = 25.59 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -424366.81 (J) H = -350621.30 (J) S = 59.32 (J/K) V = 9.84 (cc) Cp = 31.30 (J/K)
albite anorthite sanidine
70.85 23.26 5.89

quartz mass = 12.29 (gm) density = 2.55 (gm/cc)
SiO2
G = -204256.22 (J) H = -170813.94 (J) S = 26.90 (J/K) V = 4.81 (cc) Cp = 14.55 (J/K)

Total solids mass = 44.38 (gm) density = 2.69 (gm/cc)
G = -714899.22 (J) H = -590476.23 (J) S = 100.09 (J/K) V = 16.49 (cc) Cp = 53.29 (J/K)

Viscosity of the System: 7.86 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1617096.13 (J) H = -1316493.65 (J) S = 241.81 (J/K) V = 39.33 (cc) Cp = 127.25 (J/K)

Oxygen delta moles = -0.000766125 delta grams = -0.0245151
G = 215.32 (J) H = -23.97 (J) S = -0.19 (J/K) V = -79.19 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 52.38 (gm) density = 2.43 (gm/cc) viscosity = 6.29 (log 10 poise) (analysis in wt %)
G = -849202.57 (J) H = -684767.99 (J) S = 133.35 (J/K) V = 21.55 (cc) Cp = 69.68 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.24 0.76 13.40 0.55 0.00 2.19 0.19 0.30 0.00 0.00 1.95 3.31 4.00 0.19 1.92 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.85 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.88Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -90287.01 (J) H = -72376.60 (J) S = 14.52 (J/K) V = 1.93 (cc) Cp = 7.81 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-105.84 96.74 100.89 4.75 -4.49 7.63 0.32

feldspar mass = 27.46 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -454753.76 (J) H = -376566.62 (J) S = 63.40 (J/K) V = 10.57 (cc) Cp = 33.56 (J/K)

albite anorthite sanidine
70.78 23.00 6.22

quartz mass = 13.28 (gm) density = 2.55 (gm/cc)
SiO2
G = -220403.87 (J) H = -184717.49 (J) S = 28.94 (J/K) V = 5.20 (cc) Cp = 15.71 (J/K)

Total solids mass = 47.59 (gm) density = 2.69 (gm/cc)
G = -765444.64 (J) H = -633660.71 (J) S = 106.87 (J/K) V = 17.69 (cc) Cp = 57.08 (J/K)

Viscosity of the System: 8.30 (log 10 poise)

System mass = 99.97 (gm) density = 2.55 (gm/cc)
G = -1614647.22 (J) H = -1318428.70 (J) S = 240.21 (J/K) V = 39.24 (cc) Cp = 126.75 (J/K)

Oxygen delta moles = -0.000838545 delta grams = -0.0268324
G = 233.57 (J) H = -25.94 (J) S = -0.21 (J/K) V = -85.97 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 49.45 (gm) density = 2.43 (gm/cc) viscosity = 6.30 (log 10 poise) (analysis in wt %)
G = -800860.80 (J) H = -647106.99 (J) S = 125.70 (J/K) V = 20.37 (cc) Cp = 65.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.15 | 0.80 | 13.39 | 0.53 | 0.00 | 2.08 | 0.20 | 0.28 | 0.00 | 0.00 | 1.93 | 3.23 | 4.17 | 0.20 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.17 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.86Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -93875.36 (J) H = -75392.96 (J) S = 15.11 (J/K) V = 2.01 (cc) Cp = 8.14 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.94 96.81 102.85 4.79 -4.52 7.69 0.31

feldspar mass = 29.18 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.23Al1.23Si2.77O8
G = -482394.89 (J) H = -400346.45 (J) S = 67.08 (J/K) V = 11.22 (cc) Cp = 35.62 (J/K)
albite anorthite sanidine
70.68 22.77 6.55

quartz mass = 14.18 (gm) density = 2.55 (gm/cc)
SiO2
G = -235084.95 (J) H = -197447.68 (J) S = 30.77 (J/K) V = 5.55 (cc) Cp = 16.76 (J/K)

Total solids mass = 50.52 (gm) density = 2.69 (gm/cc)
G = -811355.19 (J) H = -673187.09 (J) S = 112.96 (J/K) V = 18.79 (cc) Cp = 60.52 (J/K)

Viscosity of the System: 9.08 (log 10 poise)

System mass = 99.97 (gm) density = 2.55 (gm/cc)
G = -1612215.99 (J) H = -1320294.08 (J) S = 238.66 (J/K) V = 39.16 (cc) Cp = 126.29 (J/K)

Oxygen delta moles = -0.000907365 delta grams = -0.0290346
G = 250.46 (J) H = -27.74 (J) S = -0.23 (J/K) V = -92.28 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 46.76 (gm) density = 2.42 (gm/cc) viscosity = 6.30 (log 10 poise) (analysis in wt %)
G = -756608.68 (J) H = -612598.38 (J) S = 118.71 (J/K) V = 19.29 (cc) Cp = 62.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.07 | 0.85 | 13.39 | 0.51 | 0.00 | 1.98 | 0.21 | 0.26 | 0.00 | 0.00 | 1.91 | 3.14 | 4.33 | 0.21 | 2.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.45 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.84Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -97075.29 (J) H = -78115.85 (J) S = 15.63 (J/K) V = 2.09 (cc) Cp = 8.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.80 | 96.87 | 104.61 | 4.83 | -4.54 | 7.72 | 0.31 |

feldspar mass = 30.75 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.23Al1.23Si2.77O8
G = -507623.51 (J) H = -422222.86 (J) S = 70.40 (J/K) V = 11.83 (cc) Cp = 37.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.57 | 22.55 | 6.89 |

quartz mass = 15.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -248494.60 (J) H = -209160.73 (J) S = 32.42 (J/K) V = 5.88 (cc) Cp = 17.73 (J/K)

Total solids mass = 53.21 (gm) density = 2.69 (gm/cc)
G = -853193.40 (J) H = -709499.44 (J) S = 118.45 (J/K) V = 19.79 (cc) Cp = 63.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1609802.08 (J) H = -1322097.83 (J) S = 237.15 (J/K) V = 39.08 (cc) Cp = 125.86 (J/K)

Oxygen delta moles = -0.000972494 delta grams = -0.0311186
G = 266.00 (J) H = -29.39 (J) S = -0.24 (J/K) V = -98.09 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 44.06 (gm) density = 2.42 (gm/cc) viscosity = 6.31 (log 10 poise) (analysis in wt %)
G = -712650.33 (J) H = -578191.85 (J) S = 111.76 (J/K) V = 18.21 (cc) Cp = 58.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.04 | 0.81 | 13.39 | 0.48 | 0.00 | 1.85 | 0.22 | 0.24 | 0.00 | 0.00 | 1.88 | 3.07 | 4.50 | 0.23 | 2.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.66 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.83Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -99303.01 (J) H = -80085.55 (J) S = 15.97 (J/K) V = 2.14 (cc) Cp = 8.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.01 | 96.91 | 105.83 | 4.83 | -4.55 | 7.70 | 0.30 |

feldspar mass = 32.30 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.22Al1.22Si2.78O8
G = -532291.07 (J) H = -443724.94 (J) S = 73.61 (J/K) V = 12.42 (cc) Cp = 39.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.36 | 22.36 | 7.28 |

quartz mass = 15.86 (gm) density = 2.55 (gm/cc)
SiO2
G = -262287.53 (J) H = -221245.47 (J) S = 34.11 (J/K) V = 6.21 (cc) Cp = 18.72 (J/K)

rhm-oxide mass = 0.09 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.09Fe"'0.22Al0.11Ti0.84O3
G = -883.60 (J) H = -675.48 (J) S = 0.17 (J/K) V = 0.02 (cc) Cp = 0.09 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.46 | 10.83 | 71.18 | 2.90 | 5.62 |

Total solids mass = 55.91 (gm) density = 2.69 (gm/cc)
G = -894765.21 (J) H = -745731.44 (J) S = 123.87 (J/K) V = 20.79 (cc) Cp = 66.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1607415.54 (J) H = -1323923.29 (J) S = 235.63 (J/K) V = 39.01 (cc) Cp = 125.42 (J/K)

Oxygen delta moles = -0.00101482 delta grams = -0.0324731
G = 275.04 (J) H = -30.30 (J) S = -0.25 (J/K) V = -101.52 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 41.57 (gm) density = 2.41 (gm/cc) viscosity = 6.31 (log 10 poise) (analysis in wt %)
G = -672051.22 (J) H = -546362.34 (J) S = 105.34 (J/K) V = 17.22 (cc) Cp = 55.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

71.02 0.76 13.40 0.46 0.00 1.73 0.24 0.22 0.00 0.00 1.86 2.99 4.67 0.24 2.41 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.83 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.07Mg0.82Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -101170.86 (J) H = -81779.51 (J) S = 16.25 (J/K) V = 2.19 (cc) Cp = 8.83 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-112.03 96.94 106.87 4.83 -4.56 7.66 0.29

feldspar mass = 33.73 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -555021.98 (J) H = -463700.64 (J) S = 76.54 (J/K) V = 12.97 (cc) Cp = 41.05 (J/K)
albite anorthite sanidine
70.12 22.19 7.69

quartz mass = 16.66 (gm) density = 2.55 (gm/cc)
SiO2
G = -275056.63 (J) H = -232514.43 (J) S = 35.66 (J/K) V = 6.52 (cc) Cp = 19.64 (J/K)

rhm-oxide mass = 0.18 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.09Fe'"0.21Al0.11Ti0.84O3
G = -1745.51 (J) H = -1338.42 (J) S = 0.34 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.27 10.74 71.47 3.03 5.50

Total solids mass = 58.40 (gm) density = 2.69 (gm/cc)
G = -932994.98 (J) H = -779333.00 (J) S = 128.79 (J/K) V = 21.72 (cc) Cp = 69.69 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1605046.20 (J) H = -1325695.35 (J) S = 234.13 (J/K) V = 38.94 (cc) Cp = 125.00 (J/K)

Oxygen delta moles = -0.00105338 delta grams = -0.033707
G = 282.86 (J) H = -31.08 (J) S = -0.26 (J/K) V = -104.50 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 39.28 (gm) density = 2.41 (gm/cc) viscosity = 6.31 (log 10 poise) (analysis in wt %)
G = -634720.61 (J) H = -517051.06 (J) S = 99.45 (J/K) V = 16.30 (cc) Cp = 52.28 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.97 0.72 13.41 0.43 0.00 1.61 0.25 0.21 0.00 0.00 1.85 2.92 4.83 0.26 2.55 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.99 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.81Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -102786.97 (J) H = -83281.36 (J) S = 16.49 (J/K) V = 2.23 (cc) Cp = 8.99 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-112.91 96.97 107.78 4.83 -4.58 7.61 0.29

feldspar mass = 35.05 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -575908.39 (J) H = -482216.39 (J) S = 79.19 (J/K) V = 13.48 (cc) Cp = 42.62 (J/K)
albite anorthite sanidine
69.88 22.02 8.11

quartz mass = 17.39 (gm) density = 2.55 (gm/cc)
SiO2
G = -286781.48 (J) H = -242944.73 (J) S = 37.05 (J/K) V = 6.81 (cc) Cp = 20.49 (J/K)

rhm-oxide mass = 0.25 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.21Al0.11Ti0.84O3
G = -2494.99 (J) H = -1918.97 (J) S = 0.49 (J/K) V = 0.05 (cc) Cp = 0.24 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.09 10.63 71.75 3.16 5.37

Total solids mass = 60.69 (gm) density = 2.69 (gm/cc)
G = -967971.83 (J) H = -810361.46 (J) S = 133.21 (J/K) V = 22.57 (cc) Cp = 72.33 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1602692.44 (J) H = -1327412.52 (J) S = 232.67 (J/K) V = 38.88 (cc) Cp = 124.61 (J/K)

Oxygen delta moles = -0.00109052 delta grams = -0.0348953
G = 290.11 (J) H = -31.79 (J) S = -0.27 (J/K) V = -107.28 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 900.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.09 COH = 1.60 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 37.16 (gm) density = 2.40 (gm/cc) viscosity = 6.30 (log 10 poise) (analysis in wt %)
G = -600220.38 (J) H = -489916.95 (J) S = 94.02 (J/K) V = 15.46 (cc) Cp = 49.48 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.91 0.68 13.43 0.41 0.00 1.50 0.26 0.19 0.00 0.00 1.83 2.85 4.98 0.27 2.70 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.12 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.09Mg0.80Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -104181.47 (J) H = -84613.74 (J) S = 16.68 (J/K) V = 2.26 (cc) Cp = 9.12 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-113.68 97.00 108.60 4.83 -4.59 7.56 0.28

feldspar mass = 36.29 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.22Al1.22Si2.78O8
G = -595198.51 (J) H = -499470.20 (J) S = 81.60 (J/K) V = 13.95 (cc) Cp = 44.07 (J/K)

albite anorthite sanidine
69.62 21.85 8.53

quartz mass = 18.07 (gm) density = 2.55 (gm/cc)
SiO2
G = -297604.24 (J) H = -252651.28 (J) S = 38.32 (J/K) V = 7.07 (cc) Cp = 21.27 (J/K)

rhm-oxide mass = 0.32 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.21Al0.11Ti0.84O3
G = -3149.35 (J) H = -2429.78 (J) S = 0.61 (J/K) V = 0.07 (cc) Cp = 0.30 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.93 10.50 72.03 3.29 5.26

Total solids mass = 62.80 (gm) density = 2.69 (gm/cc)
G = -1000133.56 (J) H = -839164.99 (J) S = 137.21 (J/K) V = 23.36 (cc) Cp = 74.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1600353.94 (J) H = -1329081.94 (J) S = 231.23 (J/K) V = 38.82 (cc) Cp = 124.24 (J/K)

Oxygen delta moles = -0.00112621 delta grams = -0.0360373
G = 296.79 (J) H = -32.43 (J) S = -0.28 (J/K) V = -109.85 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 35.20 (gm) density = 2.40 (gm/cc) viscosity = 6.29 (log 10 poise) (analysis in wt %)
G = -568177.91 (J) H = -464669.66 (J) S = 88.99 (J/K) V = 14.67 (cc) Cp = 46.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.84 | 0.63 | 13.44 | 0.39 | 0.00 | 1.39 | 0.27 | 0.18 | 0.00 | 0.00 | 1.82 | 2.78 | 5.13 | 0.28 | 2.85 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.24 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.09Mg0.80Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -105381.34 (J) H = -85796.89 (J) S = 16.84 (J/K) V = 2.29 (cc) Cp = 9.24 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-114.35 97.03 109.31 4.82 -4.60 7.50 0.28

feldspar mass = 37.44 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -613103.98 (J) H = -515631.11 (J) S = 83.80 (J/K) V = 14.40 (cc) Cp = 45.43 (J/K)
albite anorthite sanidine
69.34 21.70 8.96

quartz mass = 18.70 (gm) density = 2.55 (gm/cc)
SiO2
G = -307644.50 (J) H = -261730.90 (J) S = 39.47 (J/K) V = 7.32 (cc) Cp = 21.99 (J/K)

rhm-oxide mass = 0.38 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.21Al0.10Ti0.84O3
G = -3722.72 (J) H = -2881.12 (J) S = 0.72 (J/K) V = 0.08 (cc) Cp = 0.36 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.78 | 10.36 | 72.31 | 3.41 | 5.14 |

Total solids mass = 64.76 (gm) density = 2.69 (gm/cc)
G = -1029852.54 (J) H = -866040.01 (J) S = 140.84 (J/K) V = 24.09 (cc) Cp = 77.02 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1598030.45 (J) H = -1330709.68 (J) S = 229.82 (J/K) V = 38.76 (cc) Cp = 123.89 (J/K)

Oxygen delta moles = -0.00116045 delta grams = -0.0371331
G = 302.93 (J) H = -33.00 (J) S = -0.29 (J/K) V = -112.22 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 880.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.07 COH = 1.54 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 33.36 (gm) density = 2.40 (gm/cc) viscosity = 6.28 (log 10 poise) (analysis in wt %)
G = -538273.95 (J) H = -441060.10 (J) S = 84.30 (J/K) V = 13.93 (cc) Cp = 44.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.75 | 0.60 | 13.46 | 0.36 | 0.00 | 1.29 | 0.28 | 0.17 | 0.00 | 0.00 | 1.81 | 2.71 | 5.27 | 0.30 | 3.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.35 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.10Mg0.79Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -106410.58 (J) H = -86848.87 (J) S = 16.96 (J/K) V = 2.32 (cc) Cp = 9.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.93 | 97.06 | 109.95 | 4.82 | -4.61 | 7.43 | 0.27 |

feldspar mass = 38.52 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -629806.67 (J) H = -530844.63 (J) S = 85.82 (J/K) V = 14.81 (cc) Cp = 46.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.05 | 21.54 | 9.41 |

quartz mass = 19.29 (gm) density = 2.55 (gm/cc)
SiO2
G = -317003.83 (J) H = -270265.85 (J) S = 40.53 (J/K) V = 7.55 (cc) Cp = 22.67 (J/K)

rhm-oxide mass = 0.43 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.20Al0.10Ti0.85O3
G = -4226.70 (J) H = -3281.46 (J) S = 0.82 (J/K) V = 0.09 (cc) Cp = 0.41 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.65 | 10.21 | 72.58 | 3.53 | 5.04 |

Total solids mass = 66.60 (gm) density = 2.69 (gm/cc)
G = -1057447.78 (J) H = -891240.81 (J) S = 144.13 (J/K) V = 24.78 (cc) Cp = 79.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1595721.73 (J) H = -1332300.91 (J) S = 228.44 (J/K) V = 38.71 (cc) Cp = 123.57 (J/K)

Oxygen delta moles = -0.00119326 delta grams = -0.038183
G = 308.52 (J) H = -33.51 (J) S = -0.30 (J/K) V = -114.41 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 31.64 (gm) density = 2.39 (gm/cc) viscosity = 6.26 (log 10 poise) (analysis in wt %)
G = -510232.92 (J) H = -418872.86 (J) S = 79.92 (J/K) V = 13.23 (cc) Cp = 42.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.64 | 0.56 | 13.47 | 0.34 | 0.00 | 1.20 | 0.29 | 0.16 | 0.00 | 0.00 | 1.80 | 2.65 | 5.40 | 0.32 | 3.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.44 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.11Mg0.79Fe"'0.03Ti0.00Al0.12Si1.92O6
G = -107290.49 (J) H = -87785.69 (J) S = 17.06 (J/K) V = 2.34 (cc) Cp = 9.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.44 | 97.09 | 110.52 | 4.82 | -4.62 | 7.36 | 0.27 |

feldspar mass = 39.54 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -645464.02 (J) H = -545237.01 (J) S = 87.68 (J/K) V = 15.20 (cc) Cp = 47.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.74 | 21.39 | 9.86 |

quartz mass = 19.85 (gm) density = 2.55 (gm/cc)
SiO2
G = -325769.27 (J) H = -278326.77 (J) S = 41.50 (J/K) V = 7.77 (cc) Cp = 23.30 (J/K)

rhm-oxide mass = 0.48 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe"'0.20Al0.10Ti0.85O3
G = -4670.89 (J) H = -3637.77 (J) S = 0.90 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.52 | 10.05 | 72.86 | 3.65 | 4.93 |

Total solids mass = 68.32 (gm) density = 2.69 (gm/cc)
G = -1083194.67 (J) H = -914987.24 (J) S = 147.14 (J/K) V = 25.42 (cc) Cp = 81.07 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1593427.58 (J) H = -1333860.11 (J) S = 227.06 (J/K) V = 38.66 (cc) Cp = 123.26 (J/K)

Oxygen delta moles = -0.00122466 delta grams = -0.0391877
G = 313.60 (J) H = -33.96 (J) S = -0.30 (J/K) V = -116.40 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 860.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.06 COH = 1.48 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 30.02 (gm) density = 2.39 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -483815.15 (J) H = -397920.22 (J) S = 75.80 (J/K) V = 12.58 (cc) Cp = 40.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.51 | 0.52 | 13.49 | 0.32 | 0.00 | 1.11 | 0.30 | 0.15 | 0.00 | 0.00 | 1.79 | 2.58 | 5.53 | 0.33 | 3.34 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.52 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.11Mg0.78Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -108039.85 (J) H = -88621.54 (J) S = 17.14 (J/K) V = 2.36 (cc) Cp = 9.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.89 | 97.12 | 111.02 | 4.83 | -4.63 | 7.29 | 0.26 |

feldspar mass = 40.51 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.21Al1.21Si2.79O8
G = -660213.40 (J) H = -558918.64 (J) S = 89.39 (J/K) V = 15.57 (cc) Cp = 49.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.42 | 21.25 | 10.33 |

quartz mass = 20.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -334016.16 (J) H = -285974.86 (J) S = 42.40 (J/K) V = 7.98 (cc) Cp = 23.90 (J/K)

rhm-oxide mass = 0.52 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.08Fe'"0.20Al0.10Ti0.85O3
G = -5063.29 (J) H = -3955.88 (J) S = 0.98 (J/K) V = 0.11 (cc) Cp = 0.49 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.39 | 9.88 | 73.13 | 3.76 | 4.83 |

Total solids mass = 69.94 (gm) density = 2.69 (gm/cc)
G = -1107332.70 (J) H = -937470.91 (J) S = 149.90 (J/K) V = 26.03 (cc) Cp = 82.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1591147.85 (J) H = -1335391.13 (J) S = 225.70 (J/K) V = 38.61 (cc) Cp = 122.96 (J/K)

Oxygen delta moles = -0.00125469 delta grams = -0.0401485
G = 318.18 (J) H = -34.35 (J) S = -0.31 (J/K) V = -118.21 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 850.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.84  delta HM = -5.08  NNO = 0.00  QFM = 0.05  COH = 1.46  IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid  mass = 28.49 (gm)  density = 2.38 (gm/cc)  viscosity = 6.20 (log 10 poise)  (analysis in wt %)
G = -458810.51 (J)  H = -378037.10 (J)  S = 71.92 (J/K)  V = 11.96 (cc)  Cp = 38.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.37 | 0.49 | 13.51 | 0.30 | 0.00 | 1.03 | 0.32 | 0.14 | 0.00 | 0.00 | 1.79 | 2.53 | 5.65 | 0.35 | 3.52 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.59 (gm)  density = 3.61 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.11Mg0.78Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -108675.25 (J)  H = -89368.92 (J)  S = 17.19 (J/K)  V = 2.38 (cc)  Cp = 9.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.28 | 97.15 | 111.46 | 4.83 | -4.64 | 7.22 | 0.26 |

feldspar  mass = 41.43 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -674175.59 (J)  H = -571986.89 (J)  S = 90.98 (J/K)  V = 15.93 (cc)  Cp = 50.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.08 | 21.11 | 10.81 |

quartz  mass = 20.88 (gm)  density = 2.55 (gm/cc)
SiO2
G = -341810.45 (J)  H = -293263.84 (J)  S = 43.22 (J/K)  V = 8.18 (cc)  Cp = 24.46 (J/K)

rhm-oxide  mass = 0.56 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.73Mg0.08Fe'"0.19Al0.09Ti0.86O3
G = -5410.57 (J)  H = -4240.63 (J)  S = 1.04 (J/K)  V = 0.12 (cc)  Cp = 0.52 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.28 | 9.71 | 73.41 | 3.87 | 4.74 |

Total solids  mass = 71.47 (gm)  density = 2.69 (gm/cc)
G = -1130071.86 (J)  H = -958860.27 (J)  S = 152.44 (J/K)  V = 26.60 (cc)  Cp = 84.66 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.59 (gm/cc)
G = -1588882.38 (J)  H = -1336897.38 (J)  S = 224.36 (J/K)  V = 38.56 (cc)  Cp = 122.68 (J/K)

Oxygen  delta moles = -0.00128338  delta grams = -0.0410668
G = 322.27 (J)  H = -34.68 (J)  S = -0.32 (J/K)  V = -119.85 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 840.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -13.04  delta HM = -5.09  NNO = 0.00  QFM = 0.04  COH = 1.43  IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 27.03 (gm) density = 2.38 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -435033.12 (J) H = -359077.00 (J) S = 68.24 (J/K) V = 11.36 (cc) Cp = 36.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.20 | 0.46 | 13.53 | 0.29 | 0.00 | 0.96 | 0.33 | 0.14 | 0.00 | 0.00 | 1.79 | 2.47 | 5.75 | 0.37 | 3.71 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.66 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.12Mg0.78Fe"'0.02Ti0.00Al0.12Si1.93O6
G = -109211.29 (J) H = -90038.89 (J) S = 17.22 (J/K) V = 2.40 (cc) Cp = 9.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.62 | 97.18 | 111.86 | 4.84 | -4.66 | 7.15 | 0.25 |

feldspar mass = 42.32 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -687457.68 (J) H = -584528.38 (J) S = 92.47 (J/K) V = 16.26 (cc) Cp = 51.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.73 | 20.96 | 11.31 |

quartz mass = 21.36 (gm) density = 2.55 (gm/cc)
SiO2
G = -349210.60 (J) H = -300241.45 (J) S = 43.99 (J/K) V = 8.36 (cc) Cp = 25.00 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.08Fe"'0.19Al0.09Ti0.86O3
G = -5718.36 (J) H = -4496.11 (J) S = 1.10 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.16 | 9.53 | 73.68 | 3.97 | 4.65 |

Total solids mass = 72.93 (gm) density = 2.69 (gm/cc)
G = -1151597.93 (J) H = -979304.83 (J) S = 154.78 (J/K) V = 27.15 (cc) Cp = 86.31 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1586631.05 (J) H = -1338381.83 (J) S = 223.02 (J/K) V = 38.52 (cc) Cp = 122.42 (J/K)

Oxygen delta moles = -0.0013108 delta grams = -0.0419439
G = 325.91 (J) H = -34.96 (J) S = -0.32 (J/K) V = -121.32 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 25.27 (gm) density = 2.37 (gm/cc) viscosity = 6.08 (log 10 poise) (analysis in wt %)
G = -406620.58 (J) H = -336100.94 (J) S = 63.93 (J/K) V = 10.65 (cc) Cp = 33.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

70.01 0.42 13.53 0.28 0.00 0.90 0.35 0.13 0.00 0.00 1.81 2.48 5.74 0.40 3.97 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.70 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.12Mg0.78Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -109605.36 (J) H = -90597.57 (J) S = 17.23 (J/K) V = 2.41 (cc) Cp = 9.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.93 | 97.24 | 112.16 | 4.88 | -4.71 | 7.12 | 0.25 |

feldspar mass = 42.34 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -686911.82 (J) H = -585382.86 (J) S = 92.04 (J/K) V = 16.26 (cc) Cp = 51.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.70 | 21.21 | 11.08 |

feldspar mass = 1.11 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.03Al1.03Si2.97O8
G = -17430.86 (J) H = -14820.28 (J) S = 2.37 (J/K) V = 0.44 (cc) Cp = 1.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.73 | 2.56 | 63.71 |

quartz mass = 21.91 (gm) density = 2.55 (gm/cc)
SiO2
G = -357773.21 (J) H = -308246.61 (J) S = 44.90 (J/K) V = 8.58 (cc) Cp = 25.61 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.08Fe'"0.19Al0.09Ti0.86O3
G = -6053.15 (J) H = -4774.66 (J) S = 1.16 (J/K) V = 0.13 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.06 | 9.34 | 73.96 | 4.06 | 4.58 |

Total solids mass = 74.69 (gm) density = 2.68 (gm/cc)
G = -1177774.40 (J) H = -1003821.97 (J) S = 157.69 (J/K) V = 27.82 (cc) Cp = 88.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1584394.98 (J) H = -1339922.91 (J) S = 221.61 (J/K) V = 38.47 (cc) Cp = 122.12 (J/K)

Oxygen delta moles = -0.00133509 delta grams = -0.0427212
G = 328.65 (J) H = -35.13 (J) S = -0.33 (J/K) V = -122.45 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 820.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.02 COH = 1.37 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 23.43 (gm) density = 2.37 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -377024.85 (J) H = -312002.35 (J) S = 59.48 (J/K) V = 9.90 (cc) Cp = 31.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

69.77 0.38 13.52 0.27 0.00 0.86 0.37 0.12 0.00 0.00 1.83 2.52 5.65 0.43 4.28 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.75 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.12Mg0.77Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -109909.36 (J) H = -91085.40 (J) S = 17.22 (J/K) V = 2.42 (cc) Cp = 9.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.23 | 97.31 | 112.40 | 4.95 | -4.79 | 7.11 | 0.24 |

feldspar mass = 41.97 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.22Al1.22Si2.78O8
G = -680300.40 (J) H = -581076.47 (J) S = 90.77 (J/K) V = 16.11 (cc) Cp = 50.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.86 | 21.65 | 10.50 |

feldspar mass = 2.66 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -41917.90 (J) H = -35720.61 (J) S = 5.67 (J/K) V = 1.05 (cc) Cp = 3.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.70 | 2.39 | 64.91 |

quartz mass = 22.49 (gm) density = 2.55 (gm/cc)
SiO2
G = -366650.84 (J) H = -316553.87 (J) S = 45.83 (J/K) V = 8.80 (cc) Cp = 26.25 (J/K)

rhm-oxide mass = 0.66 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.08Fe'"0.18Al0.09Ti0.86O3
G = -6370.78 (J) H = -5041.46 (J) S = 1.22 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.96 | 9.14 | 74.23 | 4.13 | 4.53 |

Total solids mass = 76.53 (gm) density = 2.68 (gm/cc)
G = -1205149.28 (J) H = -1029477.82 (J) S = 160.70 (J/K) V = 28.53 (cc) Cp = 90.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1582174.13 (J) H = -1341480.17 (J) S = 220.18 (J/K) V = 38.42 (cc) Cp = 121.83 (J/K)

Oxygen delta moles = -0.00135763 delta grams = -0.0434425
G = 330.85 (J) H = -35.25 (J) S = -0.33 (J/K) V = -123.39 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 21.71 (gm) density = 2.36 (gm/cc) viscosity = 5.82 (log 10 poise) (analysis in wt %)
G = -349339.52 (J) H = -289398.81 (J) S = 55.34 (J/K) V = 9.20 (cc) Cp = 29.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

69.48 0.35 13.51 0.26 0.00 0.82 0.40 0.12 0.00 0.00 1.85 2.57 5.55 0.46 4.62 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.78 (gm) density = 3.62 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.77Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -110166.01 (J) H = -91535.88 (J) S = 17.20 (J/K) V = 2.43 (cc) Cp = 9.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.51 | 97.39 | 112.62 | 5.02 | -4.86 | 7.11 | 0.24 |

feldspar mass = 41.69 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.22Al1.22Si2.78O8
G = -675033.91 (J) H = -577891.35 (J) S = 89.69 (J/K) V = 15.99 (cc) Cp = 50.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.01 | 22.04 | 9.95 |

feldspar mass = 4.06 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -63737.91 (J) H = -54437.35 (J) S = 8.59 (J/K) V = 1.60 (cc) Cp = 4.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.72 | 2.23 | 66.05 |

quartz mass = 23.03 (gm) density = 2.55 (gm/cc)
SiO2
G = -375050.53 (J) H = -324478.79 (J) S = 46.69 (J/K) V = 9.02 (cc) Cp = 26.86 (J/K)

rhm-oxide mass = 0.69 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.08Fe'''0.18Al0.09Ti0.87O3
G = -6639.97 (J) H = -5271.43 (J) S = 1.26 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.87 | 8.94 | 74.52 | 4.19 | 4.48 |

Total solids mass = 78.25 (gm) density = 2.68 (gm/cc)
G = -1230628.33 (J) H = -1053614.80 (J) S = 163.42 (J/K) V = 29.18 (cc) Cp = 92.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1579967.85 (J) H = -1343013.60 (J) S = 218.76 (J/K) V = 38.38 (cc) Cp = 121.57 (J/K)

Oxygen delta moles = -0.00137956 delta grams = -0.0441443
G = 332.80 (J) H = -35.33 (J) S = -0.34 (J/K) V = -124.24 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 19.95 (gm) density = 2.35 (gm/cc) viscosity = 5.63 (log 10 poise) (analysis in wt %)
G = -321189.81 (J) H = -266257.02 (J) S = 51.19 (J/K) V = 8.48 (cc) Cp = 26.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

69.27 0.31 13.29 0.25 0.00 0.77 0.43 0.12 0.00 0.00 1.90 2.74 5.39 0.50 5.03 0.00 0.00 0.00 0.00

garnet mass = 0.99 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.63Mg0.20)3Al2Si3O12
G = -13116.39 (J) H = -11103.32 (J) S = 1.88 (J/K) V = 0.25 (cc) Cp = 1.06 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.34 | 17.02 | 19.64 |

orthopyroxene mass = 8.15 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.11Mg0.80Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -102549.86 (J) H = -85497.30 (J) S = 15.89 (J/K) V = 2.26 (cc) Cp = 9.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.14 | 97.33 | 110.73 | 4.82 | -4.67 | 6.69 | 0.24 |

feldspar mass = 40.96 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.68Ca0.22Al1.22Si2.78O8
G = -662539.98 (J) H = -568450.68 (J) S = 87.68 (J/K) V = 15.71 (cc) Cp = 49.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.46 | 21.96 | 9.58 |

feldspar mass = 5.47 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -85756.39 (J) H = -73407.10 (J) S = 11.51 (J/K) V = 2.15 (cc) Cp = 6.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.10 | 2.07 | 66.83 |

quartz mass = 23.72 (gm) density = 2.55 (gm/cc)
SiO2
G = -385741.30 (J) H = -334419.31 (J) S = 47.82 (J/K) V = 9.29 (cc) Cp = 27.63 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.08Fe'"0.17Al0.09Ti0.87O3
G = -6864.24 (J) H = -5468.95 (J) S = 1.30 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.08 | 8.57 | 74.70 | 4.31 | 4.33 |

Total solids mass = 80.00 (gm) density = 2.68 (gm/cc)
G = -1256568.17 (J) H = -1078346.66 (J) S = 166.07 (J/K) V = 29.81 (cc) Cp = 94.37 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1577757.98 (J) H = -1344603.68 (J) S = 217.26 (J/K) V = 38.29 (cc) Cp = 121.26 (J/K)

Oxygen delta moles = -0.0014362 delta grams = -0.0459567
G = 342.92 (J) H = -36.28 (J) S = -0.35 (J/K) V = -128.14 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 18.29 (gm) density = 2.34 (gm/cc) viscosity = 5.41 (log 10 poise) (analysis in wt %)
G = -294486.59 (J) H = -244231.87 (J) S = 47.27 (J/K) V = 7.81 (cc) Cp = 24.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.99 | 0.28 | 13.04 | 0.24 | 0.00 | 0.72 | 0.46 | 0.12 | 0.00 | 0.00 | 1.96 | 2.93 | 5.21 | 0.55 | 5.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.01 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.63Mg0.20)3Al2Si3O12
G = -26647.58 (J) H = -22618.59 (J) S = 3.79 (J/K) V = 0.51 (cc) Cp = 2.15 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.66 | 17.53 | 19.81 |

orthopyroxene mass = 7.50 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.82Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -94764.94 (J) H = -79281.71 (J) S = 14.56 (J/K) V = 2.08 (cc) Cp = 8.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.42 | 97.27 | 108.53 | 4.59 | -4.45 | 6.25 | 0.24 |

feldspar mass = 40.26 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -650367.87 (J) H = -559234.04 (J) S = 85.72 (J/K) V = 15.43 (cc) Cp = 48.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.96 | 21.80 | 9.24 |

feldspar mass = 6.77 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.02Al1.02Si2.98O8
G = -106000.93 (J) H = -90939.14 (J) S = 14.17 (J/K) V = 2.67 (cc) Cp = 7.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.52 | 1.93 | 67.55 |

quartz mass = 24.39 (gm) density = 2.55 (gm/cc)
SiO2
G = -396246.05 (J) H = -344235.69 (J) S = 48.92 (J/K) V = 9.55 (cc) Cp = 28.38 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.08Fe'"0.16Al0.08Ti0.88O3
G = -7050.76 (J) H = -5637.76 (J) S = 1.33 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.35 | 8.19 | 74.84 | 4.43 | 4.19 |

Total solids mass = 81.67 (gm) density = 2.69 (gm/cc)
G = -1281078.13 (J) H = -1101946.93 (J) S = 168.49 (J/K) V = 30.40 (cc) Cp = 96.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1575564.72 (J) H = -1346178.80 (J) S = 215.76 (J/K) V = 38.21 (cc) Cp = 120.99 (J/K)

Oxygen delta moles = -0.00148995 delta grams = -0.0476766
G = 352.09 (J) H = -37.11 (J) S = -0.37 (J/K) V = -131.70 (cc) Cp = -0.05 (J/K)

**********_____**********
Title: f8a2

T = 780.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = -0.02  COH = 1.24  IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 16.70 (gm)  density = 2.33 (gm/cc)  viscosity = 5.17 (log 10 poise)  (analysis in wt %)
G = -269119.29 (J)  H = -223242.20 (J)  S = 43.56 (J/K)  V = 7.16 (cc)  Cp = 22.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.62 | 0.25 | 12.80 | 0.23 | 0.00 | 0.68 | 0.50 | 0.12 | 0.00 | 0.00 | 2.02 | 3.15 | 5.02 | 0.60 | 6.01 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 2.95 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -39078.34 (J)  H = -33258.65 (J)  S = 5.53 (J/K)  V = 0.74 (cc)  Cp = 3.14 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.99 | 18.02 | 19.99 |

orthopyroxene  mass = 6.91 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.85Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -87706.60 (J)  H = -73630.25 (J)  S = 13.37 (J/K)  V = 1.92 (cc)  Cp = 7.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.68 | 97.21 | 106.27 | 4.37 | -4.24 | 5.83 | 0.24 |

feldspar  mass = 39.62 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -639407.88 (J)  H = -551014.77 (J)  S = 83.93 (J/K)  V = 15.19 (cc)  Cp = 48.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.47 | 21.62 | 8.92 |

feldspar  mass = 7.97 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.68Na0.30Ca0.02Al1.02Si2.98O8
G = -124504.53 (J)  H = -107051.73 (J)  S = 16.57 (J/K)  V = 3.14 (cc)  Cp = 9.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.95 | 1.79 | 68.26 |

quartz  mass = 25.05 (gm)  density = 2.55 (gm/cc)
SiO2
G = -406367.37 (J)  H = -353754.96 (J)  S = 49.96 (J/K)  V = 9.81 (cc)  Cp = 29.11 (J/K)

rhm-oxide  mass = 0.75 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.75Mg0.09Fe'"0.16Al0.08Ti0.88O3
G = -7205.86 (J)  H = -5782.41 (J)  S = 1.35 (J/K)  V = 0.16 (cc)  Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.62 | 7.81 | 74.97 | 4.54 | 4.06 |

Total solids  mass = 83.25 (gm)  density = 2.69 (gm/cc)
G = -1304270.58 (J)  H = -1124492.78 (J)  S = 170.70 (J/K)  V = 30.96 (cc)  Cp = 98.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1573389.87 (J) H = -1347734.99 (J) S = 214.27 (J/K) V = 38.13 (cc) Cp = 120.76 (J/K)

Oxygen delta moles = -0.00153719 delta grams = -0.0491883
G = 359.48 (J) H = -37.75 (J) S = -0.38 (J/K) V = -134.60 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 15.18 (gm) density = 2.32 (gm/cc) viscosity = 4.90 (log 10 poise) (analysis in wt %)
G = -244694.78 (J) H = -202960.71 (J) S = 40.01 (J/K) V = 6.54 (cc) Cp = 20.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.13 | 0.22 | 12.56 | 0.22 | 0.00 | 0.64 | 0.55 | 0.13 | 0.00 | 0.00 | 2.09 | 3.40 | 4.79 | 0.66 | 6.61 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.81 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.20)3Al2Si3O12
G = -50550.27 (J) H = -43136.43 (J) S = 7.11 (J/K) V = 0.96 (cc) Cp = 4.06 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.32 | 18.49 | 20.19 |

orthopyroxene mass = 6.38 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.87Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -81275.43 (J) H = -68465.46 (J) S = 12.28 (J/K) V = 1.78 (cc) Cp = 7.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.93 | 97.15 | 103.97 | 4.16 | -4.04 | 5.44 | 0.25 |

feldspar mass = 39.06 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -629547.85 (J) H = -543703.43 (J) S = 82.29 (J/K) V = 14.97 (cc) Cp = 47.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.98 | 21.42 | 8.60 |

feldspar mass = 9.08 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -141571.39 (J) H = -121997.03 (J) S = 18.76 (J/K) V = 3.57 (cc) Cp = 10.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.38 | 1.66 | 68.96 |

quartz mass = 25.69 (gm) density = 2.55 (gm/cc)
SiO2
G = -416258.56 (J) H = -363108.68 (J) S = 50.95 (J/K) V = 10.06 (cc) Cp = 29.82 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.09Fe'"0.15Al0.08Ti0.89O3
G = -7334.58 (J) H = -5906.69 (J) S = 1.37 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.90 | 7.45 | 75.09 | 4.62 | 3.94 |

Total solids mass = 84.77 (gm) density = 2.69 (gm/cc)
G = -1326538.09 (J) H = -1146317.72 (J) S = 172.77 (J/K) V = 31.50 (cc) Cp = 99.88 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1571232.87 (J) H = -1349278.44 (J) S = 212.77 (J/K) V = 38.05 (cc) Cp = 120.58 (J/K)

Oxygen delta moles = -0.0015789 delta grams = -0.0505228
G = 365.36 (J) H = -38.22 (J) S = -0.39 (J/K) V = -136.94 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 13.69 (gm) density = 2.31 (gm/cc) viscosity = 4.60 (log 10 poise) (analysis in wt %)
G = -220946.45 (J) H = -183180.14 (J) S = 36.55 (J/K) V = 5.94 (cc) Cp = 18.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.38 | 0.19 | 12.50 | 0.21 | 0.00 | 0.60 | 0.61 | 0.13 | 0.00 | 0.00 | 2.10 | 3.67 | 4.54 | 0.73 | 7.33 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.83 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -64006.46 (J) H = -54747.95 (J) S = 8.96 (J/K) V = 1.22 (cc) Cp = 5.14 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.16 | 17.97 | 20.87 |

orthopyroxene mass = 5.59 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.02Mg0.90Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -71659.80 (J) H = -60573.30 (J) S = 10.73 (J/K) V = 1.56 (cc) Cp = 6.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.49 | 97.30 | 101.58 | 4.12 | -4.00 | 5.25 | 0.25 |

clinopyroxene mass = 0.22 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.36Mg0.56Fe'"0.05Ti0.04Al0.21Si1.87O6
G = -3103.79 (J) H = -2678.50 (J) S = 0.41 (J/K) V = 0.06 (cc) Cp = 0.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.09 | 8.50 | 35.68 | 8.52 | 0.02 | 4.48 | 7.71 |

clinopyroxene mass = 0.13 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.29Mg0.30Fe'"0.05Ti0.40Al0.74Si1.24O6
G = -1823.54 (J) H = -1579.99 (J) S = 0.24 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.96 | 1.52 | 28.71 | 71.20 | 8.40 | -3.78 | 6.91 |

feldspar mass = 38.29 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -616402.36 (J) H = -533478.92 (J) S = 80.26 (J/K) V = 14.68 (cc) Cp = 46.70 (J/K)

albite anorthite sanidine
70.89 20.66 8.45

feldspar mass = 10.10 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -157291.05 (J) H = -135842.19 (J) S = 20.76 (J/K) V = 3.98 (cc) Cp = 11.93 (J/K)
albite anorthite sanidine
29.18 1.53 69.30

quartz mass = 26.37 (gm) density = 2.55 (gm/cc)
SiO2
G = -426818.67 (J) H = -373081.35 (J) S = 52.01 (J/K) V = 10.33 (cc) Cp = 30.57 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.09Fe'"0.14Al0.08Ti0.89O3
G = -7042.53 (J) H = -5692.43 (J) S = 1.31 (J/K) V = 0.16 (cc) Cp = 0.67 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.23 7.06 75.08 4.72 3.91

Total solids mass = 86.26 (gm) density = 2.69 (gm/cc)
G = -1348148.21 (J) H = -1167674.63 (J) S = 174.68 (J/K) V = 32.02 (cc) Cp = 101.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1569094.65 (J) H = -1350854.78 (J) S = 211.24 (J/K) V = 37.95 (cc) Cp = 120.45 (J/K)

Oxygen delta moles = -0.00161389 delta grams = -0.0516425
G = 369.51 (J) H = -38.50 (J) S = -0.39 (J/K) V = -138.63 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 11.46 (gm) density = 2.29 (gm/cc) viscosity = 4.11 (log 10 poise) (analysis in wt %)
G = -185157.55 (J) H = -153180.10 (J) S = 31.25 (J/K) V = 5.01 (cc) Cp = 15.87 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.38 0.15 11.91 0.24 0.00 0.64 0.72 0.12 0.00 0.00 2.23 4.29 4.10 0.88 8.35 0.00 0.00 0.00 0.00

garnet mass = 7.25 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -95548.51 (J) H = -81885.42 (J) S = 13.35 (J/K) V = 1.82 (cc) Cp = 7.69 (J/K)
almandine grossular pyrope
62.26 17.99 19.75

orthopyroxene mass = 2.98 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.87Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -37803.39 (J) H = -32004.12 (J) S = 5.67 (J/K) V = 0.83 (cc) Cp = 3.32 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.55 97.46 104.57 4.00 -3.89 5.16 0.24

clinopyroxene mass = 0.62 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.37Mg0.55Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -8850.66 (J) H = -7651.05 (J) S = 1.17 (J/K) V = 0.18 (cc) Cp = 0.68 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
33.98 8.39 37.09 7.78 0.39 4.26 8.11

biotite mass = 1.09 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -16969.84 (J) H = -14591.89 (J) S = 2.32 (J/K) V = 0.39 (cc) Cp = 1.36 (J/K)
annite phlogopite
7.25 92.75

feldspar mass = 37.39 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -601003.27 (J) H = -521211.29 (J) S = 77.99 (J/K) V = 14.34 (cc) Cp = 45.87 (J/K)
albite anorthite sanidine
72.36 19.12 8.53

feldspar mass = 10.45 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -162574.56 (J) H = -140711.55 (J) S = 21.37 (J/K) V = 4.12 (cc) Cp = 12.36 (J/K)
albite anorthite sanidine
29.49 1.38 69.13

quartz mass = 27.94 (gm) density = 2.55 (gm/cc)
SiO2
G = -451654.56 (J) H = -395594.37 (J) S = 54.79 (J/K) V = 10.94 (cc) Cp = 32.35 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.09Fe'"0.14Al0.07Ti0.89O3
G = -7422.68 (J) H = -6013.37 (J) S = 1.38 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.65 7.18 75.75 4.74 3.68

Total solids mass = 88.49 (gm) density = 2.70 (gm/cc)
G = -1381827.47 (J) H = -1199663.06 (J) S = 178.04 (J/K) V = 32.79 (cc) Cp = 104.34 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1566985.02 (J) H = -1352843.16 (J) S = 209.30 (J/K) V = 37.80 (cc) Cp = 120.21 (J/K)

Oxygen delta moles = -0.00162644 delta grams = -0.0520442
G = 368.41 (J) H = -38.23 (J) S = -0.40 (J/K) V = -138.36 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 9.30 (gm) density = 2.26 (gm/cc) viscosity = 3.49 (log 10 poise) (analysis in wt %)
G = -150364.56 (J) H = -123915.65 (J) S = 26.11 (J/K) V = 4.11 (cc) Cp = 13.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.80 | 0.11 | 11.14 | 0.28 | 0.00 | 0.73 | 0.89 | 0.10 | 0.00 | 0.00 | 2.42 | 5.14 | 3.55 | 1.08 | 9.77 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.56 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.64Mg0.18)3Al2Si3O12
G = -125175.77 (J) H = -107471.49 (J) S = 17.47 (J/K) V = 2.40 (cc) Cp = 10.10 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.68 | 18.04 | 18.28 |

orthopyroxene mass = 0.43 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.83Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -5346.94 (J) H = -4531.65 (J) S = 0.80 (J/K) V = 0.12 (cc) Cp = 0.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.95 | 97.63 | 108.89 | 3.86 | -3.77 | 5.10 | 0.24 |

clinopyroxene mass = 0.90 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.40Mg0.52Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -12847.12 (J) H = -11120.82 (J) S = 1.70 (J/K) V = 0.26 (cc) Cp = 0.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.68 | 8.38 | 39.51 | 6.87 | 0.87 | 4.09 | 8.59 |

biotite mass = 2.23 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -34610.01 (J) H = -29800.96 (J) S = 4.75 (J/K) V = 0.80 (cc) Cp = 2.78 (J/K)

| annite | phlogopite |
|---|---|
| 9.19 | 90.81 |

feldspar mass = 36.58 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.17Al1.17Si2.83O8
G = -587105.17 (J) H = -510192.64 (J) S = 75.91 (J/K) V = 14.05 (cc) Cp = 45.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.89 | 17.46 | 8.64 |

feldspar mass = 10.63 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -165238.71 (J) H = -143328.56 (J) S = 21.63 (J/K) V = 4.19 (cc) Cp = 12.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.87 | 1.24 | 68.89 |

quartz mass = 29.53 (gm) density = 2.55 (gm/cc)
SiO2
G = -476746.39 (J) H = -418419.14 (J) S = 57.57 (J/K) V = 11.56 (cc) Cp = 34.14 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.77Mg0.08Fe'"0.15Al0.07Ti0.89O3
G = -7460.89 (J) H = -6056.57 (J) S = 1.39 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.90 | 7.41 | 76.54 | 4.74 | 3.42 |

Total solids mass = 90.65 (gm) density = 2.70 (gm/cc)
G = -1414531.00 (J) H = -1230921.82 (J) S = 181.23 (J/K) V = 33.54 (cc) Cp = 107.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1564895.57 (J) H = -1354837.47 (J) S = 207.33 (J/K) V = 37.66 (cc) Cp = 120.09 (J/K)

Oxygen delta moles = -0.00163867 delta grams = -0.0524355
G = 367.17 (J) H = -37.95 (J) S = -0.40 (J/K) V = -138.04 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 730.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.07 COH = 1.06 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 7.57 (gm) density = 2.23 (gm/cc) viscosity = 2.78 (log 10 poise) (analysis in wt %)
G = -122749.82 (J) H = -100585.40 (J) S = 22.09 (J/K) V = 3.40 (cc) Cp = 10.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.21 | 0.08 | 10.72 | 0.31 | 0.00 | 0.76 | 1.09 | 0.09 | 0.00 | 0.00 | 2.70 | 5.89 | 3.03 | 1.33 | 11.80 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.96 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.64Mg0.17)3Al2Si3O12
G = -130103.70 (J) H = -111953.12 (J) S = 18.09 (J/K) V = 2.50 (cc) Cp = 10.51 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.10 | 18.69 | 17.20 |

clinopyroxene mass = 0.80 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.84Fe"0.40Mg0.51Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -11419.57 (J) H = -9905.97 (J) S = 1.51 (J/K) V = 0.24 (cc) Cp = 0.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.42 | 7.54 | 39.84 | 7.28 | 1.18 | 3.88 | 8.86 |

biotite mass = 2.60 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.10Mg0.90)3AlSi3O10(OH)2
G = -40035.77 (J) H = -34535.60 (J) S = 5.48 (J/K) V = 0.93 (cc) Cp = 3.22 (J/K)

| annite | phlogopite |
|---|---|
| 10.21 | 89.79 |

feldspar mass = 36.62 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.17Al1.17Si2.83O8
G = -587052.08 (J) H = -511267.45 (J) S = 75.55 (J/K) V = 14.06 (cc) Cp = 45.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.35 | 17.37 | 8.29 |

feldspar mass = 11.21 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -173863.73 (J) H = -151143.61 (J) S = 22.65 (J/K) V = 4.41 (cc) Cp = 13.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.13 | 1.14 | 69.73 |

quartz mass = 30.39 (gm) density = 2.55 (gm/cc)
SiO2
G = -490093.10 (J) H = -431002.66 (J) S = 58.90 (J/K) V = 11.90 (cc) Cp = 35.10 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.77Mg0.07Fe'"0.14Al0.07Ti0.90O3
G = -7500.55 (J) H = -6106.31 (J) S = 1.39 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.47 | 7.19 | 77.43 | 4.61 | 3.31 |

Total solids mass = 92.38 (gm) density = 2.70 (gm/cc)
G = -1440068.50 (J) H = -1255914.71 (J) S = 183.58 (J/K) V = 34.20 (cc) Cp = 109.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1562818.33 (J) H = -1356500.11 (J) S = 205.67 (J/K) V = 37.60 (cc) Cp = 120.31 (J/K)

Oxygen delta moles = -0.0016626 delta grams = -0.0532012
G = 368.48 (J) H = -37.92 (J) S = -0.41 (J/K) V = -138.67 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.26 (log 10 poise)  (analysis in wt %)
G = -1700817.06 (J)  H = -1258029.73 (J)  S = 281.47 (J/K)  V = 40.91 (cc)  Cp = 142.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.61 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.26 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1700817.06 (J)  H = -1258029.73 (J)  S = 281.47 (J/K)  V = 40.91 (cc)  Cp = 142.53 (J/K)

Oxygen  delta moles = 3.747e-16  delta grams = 1.199e-14
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.32 (log 10 poise)  (analysis in wt %)
G = -1698008.01 (J)  H = -1259455.94 (J)  S = 280.56 (J/K)  V = 40.88 (cc)  Cp = 142.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.61 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.32 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1698008.01 (J)  H = -1259455.94 (J)  S = 280.56 (J/K)  V = 40.88 (cc)  Cp = 142.53 (J/K)

Oxygen  delta moles = 1.98985e-06  delta grams = 6.36728e-05
G = -0.72 (J)  H = 0.09 (J)  S = 0.00 (J/K)  V = 0.26 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.38 (log 10 poise)  (analysis in wt %)
G = -1695208.22 (J)  H = -1260882.18 (J)  S = 279.64 (J/K)  V = 40.85 (cc)  Cp = 142.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.61 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.38 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1695208.22 (J)  H = -1260882.18 (J)  S = 279.64 (J/K)  V = 40.85 (cc)  Cp = 142.52 (J/K)

Oxygen  delta moles = 4.23133e-06  delta grams = 0.000135398
G = -1.52 (J)  H = 0.18 (J)  S = 0.00 (J/K)  V = 0.55 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.44 (log 10 poise)  (analysis in wt %)
G = -1692417.75 (J)  H = -1262308.46 (J)  S = 278.72 (J/K)  V = 40.82 (cc)  Cp = 142.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.61 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.44 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1692417.75 (J)  H = -1262308.46 (J)  S = 278.72 (J/K)  V = 40.82 (cc)  Cp = 142.51 (J/K)

Oxygen  delta moles = 6.7315e-06  delta grams = 0.0002154
G = -2.41 (J)  H = 0.28 (J)  S = 0.00 (J/K)  V = 0.86 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1689636.65 (J)  H = -1263734.78 (J)  S = 277.80 (J/K)  V = 40.79 (cc)  Cp = 142.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.61 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1689636.65 (J)  H = -1263734.78 (J)  S = 277.80 (J/K)  V = 40.79 (cc)  Cp = 142.50 (J/K)

Oxygen  delta moles = 9.49769e-06  delta grams = 0.000303915
G = -3.37 (J)  H = 0.40 (J)  S = 0.00 (J/K)  V = 1.21 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.56 (log 10 poise)  (analysis in wt %)
G = -1686864.98 (J)  H = -1265161.15 (J)  S = 276.86 (J/K)  V = 40.76 (cc)  Cp = 142.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.61 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1686864.98 (J)  H = -1265161.15 (J)  S = 276.86 (J/K)  V = 40.76 (cc)  Cp = 142.49 (J/K)

Oxygen  delta moles = 1.25375e-05  delta grams = 0.000401186
G = -4.42 (J)  H = 0.52 (J)  S = 0.00 (J/K)  V = 1.59 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1240.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.24  COH = 2.19  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.63 (log 10 poise) (analysis in wt %)
G = -1684102.83 (J) H = -1266587.57 (J) S = 275.92 (J/K) V = 40.73 (cc) Cp = 142.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.61 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.63 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1684102.83 (J) H = -1266587.57 (J) S = 275.92 (J/K) V = 40.73 (cc) Cp = 142.48 (J/K)

Oxygen delta moles = 1.5859e-05 delta grams = 0.000507469
G = -5.55 (J) H = 0.65 (J) S = 0.00 (J/K) V = 2.00 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -1681350.24 (J) H = -1268014.05 (J) S = 274.98 (J/K) V = 40.70 (cc) Cp = 142.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.62 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.69 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1681350.24 (J) H = -1268014.05 (J) S = 274.98 (J/K) V = 40.70 (cc) Cp = 142.48 (J/K)

Oxygen delta moles = 1.94704e-05 delta grams = 0.000623031
G = -6.76 (J) H = 0.79 (J) S = 0.01 (J/K) V = 2.43 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1678607.28 (J) H = -1269440.61 (J) S = 274.03 (J/K) V = 40.68 (cc) Cp = 142.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.62 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1678607.28 (J) H = -1269440.61 (J) S = 274.03 (J/K) V = 40.68 (cc) Cp = 142.47 (J/K)

Oxygen delta moles = 2.33805e-05 delta grams = 0.000748148
G = -8.06 (J) H = 0.94 (J) S = 0.01 (J/K) V = 2.90 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1675874.03 (J) H = -1270867.23 (J) S = 273.07 (J/K) V = 40.65 (cc) Cp = 142.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.62 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1675874.03 (J) H = -1270867.23 (J) S = 273.07 (J/K) V = 40.65 (cc) Cp = 142.46 (J/K)

Oxygen delta moles = 2.75982e-05 delta grams = 0.00088311
G = -9.44 (J) H = 1.10 (J) S = 0.01 (J/K) V = 3.40 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1200.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.12 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.89 (log 10 poise) (analysis in wt %)
G = -1673150.42 (J) H = -1272239.77 (J) S = 272.15 (J/K) V = 40.62 (cc) Cp = 134.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.62 | 0.00 | 3.04 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.89 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1673150.42 (J) H = -1272239.77 (J) S = 272.15 (J/K) V = 40.62 (cc) Cp = 134.54 (J/K)

Oxygen delta moles = 3.21331e-05 delta grams = 0.00102822
G = -10.91 (J) H = 1.27 (J) S = 0.01 (J/K) V = 3.94 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1670436.14 (J) H = -1273587.33 (J) S = 271.23 (J/K) V = 40.59 (cc) Cp = 134.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.62 | 0.00 | 3.03 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1670436.14 (J) H = -1273587.33 (J) S = 271.23 (J/K) V = 40.59 (cc) Cp = 134.51 (J/K)

Oxygen delta moles = 3.6995e-05 delta grams = 0.00118379
G = -12.47 (J) H = 1.45 (J) S = 0.01 (J/K) V = 4.50 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1667731.23 (J) H = -1274934.78 (J) S = 270.31 (J/K) V = 40.56 (cc) Cp = 134.49 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.10 0.40 13.66 0.62 0.00 3.03 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1667731.23 (J) H = -1274934.78 (J) S = 270.31 (J/K) V = 40.56 (cc) Cp = 134.49 (J/K)

Oxygen delta moles = 4.21941e-05 delta grams = 0.00135016
G = -14.11 (J) H = 1.64 (J) S = 0.01 (J/K) V = 5.10 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1665035.76 (J) H = -1276282.11 (J) S = 269.38 (J/K) V = 40.53 (cc) Cp = 134.46 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.62 0.00 3.03 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1665035.76 (J) H = -1276282.11 (J) S = 269.38 (J/K) V = 40.53 (cc) Cp = 134.46 (J/K)

Oxygen delta moles = 4.77414e-05 delta grams = 0.00152767
G = -15.84 (J) H = 1.84 (J) S = 0.01 (J/K) V = 5.73 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1160.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.05 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1662349.79 (J) H = -1277629.33 (J) S = 268.44 (J/K) V = 40.50 (cc) Cp = 134.43 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

71.09 0.40 13.66 0.63 0.00 3.03 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1662349.79 (J) H = -1277629.33 (J) S = 268.44 (J/K) V = 40.50 (cc) Cp = 134.43 (J/K)

Oxygen delta moles = 5.3648e-05 delta grams = 0.00171667
G = -17.67 (J) H = 2.05 (J) S = 0.01 (J/K) V = 6.39 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1150.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.03 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1659673.39 (J) H = -1278976.42 (J) S = 267.50 (J/K) V = 40.47 (cc) Cp = 134.39 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.63 0.00 3.03 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1659673.39 (J) H = -1278976.42 (J) S = 267.50 (J/K) V = 40.47 (cc) Cp = 134.39 (J/K)

Oxygen delta moles = 5.99258e-05 delta grams = 0.00191755
G = -19.58 (J) H = 2.26 (J) S = 0.02 (J/K) V = 7.09 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1140.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.18 COH = 2.01 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -1657006.63 (J) H = -1280323.39 (J) S = 266.56 (J/K) V = 40.44 (cc) Cp = 134.36 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.09 0.40 13.66 0.63 0.00 3.03 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1657006.63 (J) H = -1280323.39 (J) S = 266.56 (J/K) V = 40.44 (cc) Cp = 134.36 (J/K)

Oxygen delta moles = 6.6587e-05 delta grams = 0.00213071
G = -21.58 (J) H = 2.49 (J) S = 0.02 (J/K) V = 7.82 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1130.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.17 COH = 1.99 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1654349.59 (J) H = -1281670.22 (J) S = 265.60 (J/K) V = 40.41 (cc) Cp = 134.33 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.40 | 13.66 | 0.63 | 0.00 | 3.02 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.38 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1654349.59 (J) H = -1281670.22 (J) S = 265.60 (J/K) V = 40.41 (cc) Cp = 134.33 (J/K)

Oxygen delta moles = 7.36447e-05 delta grams = 0.00235654
G = -23.68 (J) H = 2.73 (J) S = 0.02 (J/K) V = 8.59 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 99.77 (gm) density = 2.48 (gm/cc) viscosity = 5.47 (log 10 poise) (analysis in wt %)
G = -1648178.01 (J) H = -1280347.11 (J) S = 264.03 (J/K) V = 40.31 (cc) Cp = 133.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.14 | 0.40 | 13.69 | 0.63 | 0.00 | 2.99 | 0.10 | 1.14 | 0.00 | 0.00 | 2.40 | 4.00 | 2.40 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.24 (gm) density = 3.36 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.59Mg1.32Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -3514.40 (J) H = -2752.23 (J) S = 0.55 (J/K) V = 0.07 (cc) Cp = 0.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.28 | 96.40 | 58.85 | 3.69 | -3.53 | 5.52 | 0.36 |

Total solids mass = 0.24 (gm) density = 3.36 (gm/cc)
G = -3514.40 (J) H = -2752.23 (J) S = 0.55 (J/K) V = 0.07 (cc) Cp = 0.29 (J/K)

Viscosity of the System: 5.47 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1651692.41 (J) H = -1283099.33 (J) S = 264.58 (J/K) V = 40.38 (cc) Cp = 134.22 (J/K)

Oxygen delta moles = 6.26028e-05 delta grams = 0.00200321
G = -19.97 (J) H = 2.30 (J) S = 0.02 (J/K) V = 7.25 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1110.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.16 COH = 1.95 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 99.38 (gm) density = 2.48 (gm/cc) viscosity = 5.56 (log 10 poise) (analysis in wt %)
G = -1639864.09 (J) H = -1277381.38 (J) S = 262.07 (J/K) V = 40.15 (cc) Cp = 133.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.21 | 0.40 | 13.73 | 0.62 | 0.00 | 2.93 | 0.10 | 1.05 | 0.00 | 0.00 | 2.41 | 4.02 | 2.41 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.62 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.61Mg1.29Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -9174.43 (J) H = -7195.97 (J) S = 1.43 (J/K) V = 0.18 (cc) Cp = 0.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.44 | 96.25 | 60.99 | 3.80 | -3.64 | 5.67 | 0.37 |

Total solids mass = 0.62 (gm) density = 3.37 (gm/cc)
G = -9174.43 (J) H = -7195.97 (J) S = 1.43 (J/K) V = 0.18 (cc) Cp = 0.75 (J/K)

Viscosity of the System: 5.57 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1649038.51 (J) H = -1284577.35 (J) S = 263.50 (J/K) V = 40.33 (cc) Cp = 134.06 (J/K)

Oxygen delta moles = 3.80952e-05 delta grams = 0.001219
G = -12.06 (J) H = 1.38 (J) S = 0.01 (J/K) V = 4.38 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1100.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.93 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 99.00 (gm) density = 2.48 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1631737.66 (J) H = -1274535.66 (J) S = 260.13 (J/K) V = 39.99 (cc) Cp = 132.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.28 | 0.41 | 13.78 | 0.61 | 0.00 | 2.87 | 0.10 | 0.97 | 0.00 | 0.00 | 2.41 | 4.03 | 2.42 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.00 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.63Mg1.27Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -14656.71 (J) H = -11513.86 (J) S = 2.29 (J/K) V = 0.29 (cc) Cp = 1.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.65 | 96.11 | 63.18 | 3.92 | -3.76 | 5.82 | 0.39 |

Total solids mass = 1.00 (gm) density = 3.38 (gm/cc)
G = -14656.71 (J) H = -11513.86 (J) S = 2.29 (J/K) V = 0.29 (cc) Cp = 1.20 (J/K)

Viscosity of the System: 5.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1646394.37 (J) H = -1286049.52 (J) S = 262.42 (J/K) V = 40.29 (cc) Cp = 133.91 (J/K)

Oxygen delta moles = 1.17036e-05 delta grams = 0.0003745
G = -3.67 (J) H = 0.42 (J) S = 0.00 (J/K) V = 1.34 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1090.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.91 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 98.63 (gm) density = 2.48 (gm/cc) viscosity = 5.77 (log 10 poise) (analysis in wt %)
G = -1623785.38 (J) H = -1271800.49 (J) S = 258.21 (J/K) V = 39.84 (cc) Cp = 132.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.36 | 0.41 | 13.82 | 0.60 | 0.00 | 2.80 | 0.10 | 0.90 | 0.00 | 0.00 | 2.42 | 4.05 | 2.43 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.37 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.65Mg1.24Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -19974.59 (J) H = -15715.73 (J) S = 3.12 (J/K) V = 0.40 (cc) Cp = 1.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.92 | 95.97 | 65.40 | 4.04 | -3.88 | 5.99 | 0.40 |

Total solids mass = 1.37 (gm) density = 3.39 (gm/cc)
G = -19974.59 (J) H = -15715.73 (J) S = 3.12 (J/K) V = 0.40 (cc) Cp = 1.64 (J/K)

Viscosity of the System: 5.79 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1643759.98 (J) H = -1287516.22 (J) S = 261.34 (J/K) V = 40.24 (cc) Cp = 133.75 (J/K)

Oxygen delta moles = -1.66606e-05 delta grams = -0.000533118
G = 5.19 (J) H = -0.59 (J) S = -0.00 (J/K) V = -1.89 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1080.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.14 COH = 1.89 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 98.27 (gm) density = 2.48 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -1615995.54 (J) H = -1269167.46 (J) S = 256.31 (J/K) V = 39.69 (cc) Cp = 131.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.43 | 0.41 | 13.86 | 0.59 | 0.00 | 2.73 | 0.10 | 0.83 | 0.00 | 0.00 | 2.42 | 4.06 | 2.44 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.73 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.68Mg1.22Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -25139.82 (J) H = -19810.29 (J) S = 3.94 (J/K) V = 0.51 (cc) Cp = 2.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.22 | 95.83 | 67.66 | 4.18 | -4.02 | 6.16 | 0.41 |

Total solids mass = 1.73 (gm) density = 3.40 (gm/cc)
G = -25139.82 (J) H = -19810.29 (J) S = 3.94 (J/K) V = 0.51 (cc) Cp = 2.07 (J/K)

Viscosity of the System: 5.89 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1641135.35 (J) H = -1288977.76 (J) S = 260.25 (J/K) V = 40.20 (cc) Cp = 133.60 (J/K)

Oxygen delta moles = -4.70713e-05 delta grams = -0.00150623
G = 14.54 (J) H = -1.66 (J) S = -0.01 (J/K) V = -5.30 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1070.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.87 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 97.91 (gm) density = 2.48 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -1608358.03 (J) H = -1266629.30 (J) S = 254.42 (J/K) V = 39.54 (cc) Cp = 130.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.51 | 0.41 | 13.90 | 0.58 | 0.00 | 2.65 | 0.10 | 0.76 | 0.00 | 0.00 | 2.43 | 4.08 | 2.45 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.09 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.19Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -30162.48 (J) H = -23805.10 (J) S = 4.73 (J/K) V = 0.61 (cc) Cp = 2.50 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-72.55 95.70 69.93 4.32 -4.16 6.34 0.43

Total solids mass = 2.09 (gm) density = 3.41 (gm/cc)
G = -30162.48 (J) H = -23805.10 (J) S = 4.73 (J/K) V = 0.61 (cc) Cp = 2.50 (J/K)

Viscosity of the System: 6.00 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1638520.52 (J) H = -1290434.39 (J) S = 259.16 (J/K) V = 40.16 (cc) Cp = 133.45 (J/K)

Oxygen delta moles = -7.95853e-05 delta grams = -0.00254663
G = 24.38 (J) H = -2.78 (J) S = -0.02 (J/K) V = -8.89 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1060.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.84 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 96.11 (gm) density = 2.48 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -1576893.56 (J) H = -1245049.22 (J) S = 248.92 (J/K) V = 38.82 (cc) Cp = 128.46 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.56 0.42 13.92 0.57 0.00 2.60 0.10 0.70 0.00 0.00 2.42 4.07 2.49 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 2.51 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.73Mg1.16Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -35973.56 (J) H = -28431.15 (J) S = 5.66 (J/K) V = 0.73 (cc) Cp = 2.99 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-75.29 95.61 72.55 4.46 -4.30 6.54 0.44

feldspar mass = 0.92 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -15368.39 (J) H = -12438.00 (J) S = 2.20 (J/K) V = 0.35 (cc) Cp = 1.12 (J/K)
albite anorthite sanidine
70.54 25.97 3.50

quartz mass = 0.46 (gm) density = 2.56 (gm/cc)
SiO2
G = -7675.23 (J) H = -6289.95 (J) S = 1.04 (J/K) V = 0.18 (cc) Cp = 0.55 (J/K)

Total solids mass = 3.89 (gm) density = 3.07 (gm/cc)
G = -59017.19 (J) H = -47159.09 (J) S = 8.89 (J/K) V = 1.26 (cc) Cp = 4.65 (J/K)

Viscosity of the System: 6.12 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1635910.75 (J) H = -1292208.31 (J) S = 257.81 (J/K) V = 40.09 (cc) Cp = 133.11 (J/K)

Oxygen delta moles = -0.000123436 delta grams = -0.00394981

G = 37.50 (J)  H = -4.26 (J)  S = -0.03 (J/K)  V = -13.68 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1050.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.12  COH = 1.82  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 88.62 (gm)  density = 2.47 (gm/cc)  viscosity = 6.07 (log 10 poise)  (analysis in wt %)
G = -1451045.69 (J)  H = -1147822.30 (J)  S = 229.17 (J/K)  V = 35.83 (cc)  Cp = 118.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.46 | 0.45 | 13.87 | 0.58 | 0.00 | 2.63 | 0.11 | 0.63 | 0.00 | 0.00 | 2.35 | 4.01 | 2.66 | 0.11 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.18 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.77Mg1.12Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -45040.19 (J)  H = -35624.31 (J)  S = 7.12 (J/K)  V = 0.92 (cc)  Cp = 3.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.59 | 95.72 | 76.54 | 4.54 | -4.38 | 6.74 | 0.43 |

feldspar  mass = 5.37 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -90050.91 (J)  H = -73043.15 (J)  S = 12.85 (J/K)  V = 2.07 (cc)  Cp = 6.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.71 | 25.48 | 3.81 |

quartz  mass = 2.81 (gm)  density = 2.56 (gm/cc)
SiO2
G = -47162.15 (J)  H = -38735.84 (J)  S = 6.37 (J/K)  V = 1.10 (cc)  Cp = 3.35 (J/K)

Total solids  mass = 11.37 (gm)  density = 2.78 (gm/cc)
G = -182253.25 (J)  H = -147403.30 (J)  S = 26.34 (J/K)  V = 4.09 (cc)  Cp = 13.68 (J/K)

Viscosity of the System: 6.27 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.51 (gm/cc)
G = -1633298.93 (J)  H = -1295225.61 (J)  S = 255.51 (J/K)  V = 39.92 (cc)  Cp = 132.04 (J/K)

Oxygen  delta moles = -0.000206922  delta grams = -0.00662126
G = 62.33 (J)  H = -7.07 (J)  S = -0.05 (J/K)  V = -22.76 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1040.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.11  COH = 1.80  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 82.05 (gm)  density = 2.47 (gm/cc)  viscosity = 6.08 (log 10 poise)  (analysis in wt %)
G = -1340860.18 (J)  H = -1062684.18 (J)  S = 211.84 (J/K)  V = 33.20 (cc)  Cp = 109.51 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.37 0.49 13.82 0.59 0.00 2.64 0.12 0.57 0.00 0.00 2.28 3.93 2.84 0.12 1.22 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.79 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.80Mg1.08Fe"'0.02Ti0.00Al0.12Si1.93O6
G = -53111.76 (J) H = -42045.04 (J) S = 8.43 (J/K) V = 1.10 (cc) Cp = 4.46 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-83.74 95.83 80.36 4.63 -4.46 6.95 0.43

feldspar mass = 9.29 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -155404.48 (J) H = -126335.85 (J) S = 22.14 (J/K) V = 3.57 (cc) Cp = 11.44 (J/K)
albite anorthite sanidine
70.83 25.04 4.13

quartz mass = 4.86 (gm) density = 2.56 (gm/cc)
SiO2
G = -81333.31 (J) H = -66949.78 (J) S = 10.95 (J/K) V = 1.90 (cc) Cp = 5.79 (J/K)

Total solids mass = 17.94 (gm) density = 2.73 (gm/cc)
G = -289849.56 (J) H = -235330.66 (J) S = 41.52 (J/K) V = 6.57 (cc) Cp = 21.69 (J/K)

Viscosity of the System: 6.43 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1630709.74 (J) H = -1298014.85 (J) S = 253.36 (J/K) V = 39.76 (cc) Cp = 131.19 (J/K)

Oxygen delta moles = -0.000289849 delta grams = -0.00927483
G = 86.58 (J) H = -9.80 (J) S = -0.07 (J/K) V = -31.65 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1030.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.10 COH = 1.78 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 76.22 (gm) density = 2.47 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -1243564.99 (J) H = -987489.27 (J) S = 196.51 (J/K) V = 30.87 (cc) Cp = 101.68 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.28 0.52 13.78 0.59 0.00 2.63 0.13 0.52 0.00 0.00 2.23 3.86 3.01 0.13 1.32 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.36 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.84Mg1.04Fe"'0.03Ti0.00Al0.12Si1.93O6
G = -60356.49 (J) H = -47827.17 (J) S = 9.61 (J/K) V = 1.25 (cc) Cp = 5.10 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-87.68 95.94 83.99 4.72 -4.53 7.15 0.42

feldspar mass = 12.76 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -213050.88 (J) H = -173588.59 (J) S = 30.28 (J/K) V = 4.90 (cc) Cp = 15.69 (J/K)
albite anorthite sanidine
70.91 24.63 4.45

quartz mass = 6.65 (gm) density = 2.56 (gm/cc)
SiO2
G = -111169.55 (J) H = -91711.89 (J) S = 14.93 (J/K) V = 2.60 (cc) Cp = 7.91 (J/K)

Total solids mass = 23.76 (gm) density = 2.71 (gm/cc)
G = -384576.92 (J) H = -313127.65 (J) S = 54.83 (J/K) V = 8.76 (cc) Cp = 28.70 (J/K)

Viscosity of the System: 6.60 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1628141.91 (J) H = -1300616.92 (J) S = 251.33 (J/K) V = 39.63 (cc) Cp = 130.38 (J/K)

Oxygen delta moles = -0.000371948 delta grams = -0.0119019
G = 110.16 (J) H = -12.44 (J) S = -0.09 (J/K) V = -40.30 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1020.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.10 COH = 1.76 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 71.03 (gm) density = 2.47 (gm/cc) viscosity = 6.10 (log 10 poise) (analysis in wt %)
G = -1157046.92 (J) H = -920602.45 (J) S = 182.84 (J/K) V = 28.80 (cc) Cp = 94.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.20 | 0.56 | 13.75 | 0.59 | 0.00 | 2.59 | 0.14 | 0.47 | 0.00 | 0.00 | 2.18 | 3.78 | 3.19 | 0.14 | 1.41 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.88 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.87Mg1.01Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -66892.10 (J) H = -53064.78 (J) S = 10.69 (J/K) V = 1.40 (cc) Cp = 5.68 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-91.39 96.05 87.39 4.81 -4.61 7.33 0.41

feldspar mass = 15.85 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -264232.49 (J) H = -215774.08 (J) S = 37.47 (J/K) V = 6.09 (cc) Cp = 19.48 (J/K)
albite anorthite sanidine
70.96 24.26 4.78

quartz mass = 8.23 (gm) density = 2.56 (gm/cc)
SiO2
G = -137422.96 (J) H = -113620.31 (J) S = 18.41 (J/K) V = 3.22 (cc) Cp = 9.79 (J/K)

Total solids mass = 28.95 (gm) density = 2.70 (gm/cc)
G = -468547.56 (J) H = -382459.17 (J) S = 66.57 (J/K) V = 10.70 (cc) Cp = 34.94 (J/K)

Viscosity of the System: 6.78 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1625594.49 (J) H = -1303061.62 (J) S = 249.42 (J/K) V = 39.50 (cc) Cp = 129.64 (J/K)

Oxygen delta moles = -0.00045281 delta grams = -0.0144894
G = 132.97 (J) H = -14.98 (J) S = -0.11 (J/K) V = -48.68 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 1010.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.09 COH = 1.73 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 66.37 (gm) density = 2.46 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -1079658.32 (J) H = -860749.19 (J) S = 170.60 (J/K) V = 26.94 (cc) Cp = 88.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.12 | 0.60 | 13.72 | 0.58 | 0.00 | 2.54 | 0.15 | 0.42 | 0.00 | 0.00 | 2.14 | 3.70 | 3.36 | 0.15 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.36 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.98Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -72802.21 (J) H = -57824.82 (J) S = 11.67 (J/K) V = 1.53 (cc) Cp = 6.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.82 | 96.16 | 90.55 | 4.89 | -4.68 | 7.50 | 0.40 |

feldspar mass = 18.62 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -309923.84 (J) H = -253654.96 (J) S = 43.85 (J/K) V = 7.15 (cc) Cp = 22.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.97 | 23.92 | 5.11 |

quartz mass = 9.64 (gm) density = 2.56 (gm/cc)
SiO2
G = -160682.39 (J) H = -133143.40 (J) S = 21.46 (J/K) V = 3.77 (cc) Cp = 11.45 (J/K)

Total solids mass = 33.61 (gm) density = 2.70 (gm/cc)
G = -543408.44 (J) H = -444623.17 (J) S = 76.99 (J/K) V = 12.45 (cc) Cp = 40.51 (J/K)

Viscosity of the System: 6.98 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1623066.76 (J) H = -1305372.36 (J) S = 247.59 (J/K) V = 39.39 (cc) Cp = 128.97 (J/K)

Oxygen delta moles = -0.000531963 delta grams = -0.0170222
G = 154.87 (J) H = -17.41 (J) S = -0.13 (J/K) V = -56.75 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71

IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 62.17 (gm) density = 2.46 (gm/cc) viscosity = 6.13 (log 10 poise) (analysis in wt %)
G = -1010085.13 (J) H = -806913.32 (J) S = 159.58 (J/K) V = 25.26 (cc) Cp = 82.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.05 | 0.64 | 13.69 | 0.57 | 0.00 | 2.48 | 0.16 | 0.39 | 0.00 | 0.00 | 2.10 | 3.62 | 3.53 | 0.16 | 1.61 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.80 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.95Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -78148.22 (J) H = -62156.38 (J) S = 12.56 (J/K) V = 1.65 (cc) Cp = 6.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.98 | 96.25 | 93.45 | 4.96 | -4.74 | 7.65 | 0.40 |

feldspar mass = 21.11 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -350907.43 (J) H = -287843.32 (J) S = 49.53 (J/K) V = 8.11 (cc) Cp = 25.90 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.95 | 23.61 | 5.44 |

quartz mass = 10.90 (gm) density = 2.56 (gm/cc)
SiO2
G = -181417.37 (J) H = -150654.68 (J) S = 24.16 (J/K) V = 4.26 (cc) Cp = 12.93 (J/K)

Total solids mass = 37.81 (gm) density = 2.70 (gm/cc)
G = -610473.01 (J) H = -500654.39 (J) S = 86.26 (J/K) V = 14.02 (cc) Cp = 45.52 (J/K)

Viscosity of the System: 7.21 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1620558.15 (J) H = -1307567.71 (J) S = 245.84 (J/K) V = 39.29 (cc) Cp = 128.36 (J/K)

Oxygen delta moles = -0.000608938 delta grams = -0.0194853
G = 175.74 (J) H = -19.71 (J) S = -0.15 (J/K) V = -64.46 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 990.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.68 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 58.37 (gm) density = 2.46 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -947259.99 (J) H = -758269.82 (J) S = 149.62 (J/K) V = 23.75 (cc) Cp = 77.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.98 | 0.68 | 13.67 | 0.56 | 0.00 | 2.40 | 0.17 | 0.35 | 0.00 | 0.00 | 2.06 | 3.54 | 3.70 | 0.17 | 1.72 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.21 (gm) density = 3.53 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.96Mg0.92Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -82977.79 (J) H = -66097.30 (J) S = 13.36 (J/K) V = 1.76 (cc) Cp = 7.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.85 | 96.35 | 96.10 | 5.03 | -4.79 | 7.78 | 0.39 |

feldspar mass = 23.37 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -387822.84 (J) H = -318839.31 (J) S = 54.61 (J/K) V = 8.98 (cc) Cp = 28.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.91 | 23.32 | 5.77 |

quartz mass = 12.03 (gm) density = 2.56 (gm/cc)
SiO2
G = -200007.53 (J) H = -166456.32 (J) S = 26.56 (J/K) V = 4.70 (cc) Cp = 14.27 (J/K)

Total solids mass = 41.60 (gm) density = 2.69 (gm/cc)
G = -670808.16 (J) H = -551392.94 (J) S = 94.54 (J/K) V = 15.44 (cc) Cp = 50.03 (J/K)

Viscosity of the System: 7.48 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1618068.15 (J) H = -1309662.75 (J) S = 244.16 (J/K) V = 39.19 (cc) Cp = 127.79 (J/K)

Oxygen delta moles = -0.000683317 delta grams = -0.0218653
G = 195.48 (J) H = -21.87 (J) S = -0.17 (J/K) V = -71.76 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 980.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.66 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 54.92 (gm) density = 2.45 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -890300.95 (J) H = -714137.30 (J) S = 140.58 (J/K) V = 22.37 (cc) Cp = 73.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.91 | 0.73 | 13.65 | 0.55 | 0.00 | 2.31 | 0.18 | 0.32 | 0.00 | 0.00 | 2.03 | 3.46 | 3.87 | 0.18 | 1.83 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.58 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.90Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -87330.66 (J) H = -69678.68 (J) S = 14.09 (J/K) V = 1.86 (cc) Cp = 7.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.43 | 96.43 | 98.49 | 5.09 | -4.84 | 7.88 | 0.38 |

feldspar mass = 25.42 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -421201.13 (J) H = -347058.24 (J) S = 59.17 (J/K) V = 9.77 (cc) Cp = 31.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.84 | 23.06 | 6.10 |

quartz mass = 13.05 (gm) density = 2.56 (gm/cc)

SiO2
G = -216763.60 (J)  H = -180795.72 (J)  S = 28.70 (J/K)  V = 5.10 (cc)  Cp = 15.47 (J/K)

Total solids  mass = 45.06 (gm)  density = 2.69 (gm/cc)
G = -725295.38 (J)  H = -597532.64 (J)  S = 101.95 (J/K)  V = 16.73 (cc)  Cp = 54.12 (J/K)

Viscosity of the System: 7.83 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.56 (gm/cc)
G = -1615596.33 (J)  H = -1311669.95 (J)  S = 242.53 (J/K)  V = 39.10 (cc)  Cp = 127.27 (J/K)

Oxygen  delta moles = -0.000754757  delta grams = -0.0241513
G = 214.02 (J)  H = -23.89 (J)  S = -0.19 (J/K)  V = -78.64 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 970.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.06  COH = 1.64  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 51.77 (gm)  density = 2.45 (gm/cc)  viscosity = 6.15 (log 10 poise)  (analysis in wt %)
G = -838468.36 (J)  H = -673944.65 (J)  S = 132.34 (J/K)  V = 21.12 (cc)  Cp = 68.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.83 | 0.77 | 13.63 | 0.53 | 0.00 | 2.21 | 0.19 | 0.29 | 0.00 | 0.00 | 2.00 | 3.37 | 4.03 | 0.19 | 1.94 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.92 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.87Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -91242.32 (J)  H = -72927.89 (J)  S = 14.73 (J/K)  V = 1.95 (cc)  Cp = 7.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.75 | 96.50 | 100.65 | 5.14 | -4.87 | 7.96 | 0.37 |

feldspar  mass = 27.29 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -451489.18 (J)  H = -372849.71 (J)  S = 63.26 (J/K)  V = 10.49 (cc)  Cp = 33.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.75 | 22.81 | 6.44 |

quartz  mass = 13.99 (gm)  density = 2.56 (gm/cc)
SiO2
G = -231942.42 (J)  H = -193877.55 (J)  S = 30.62 (J/K)  V = 5.47 (cc)  Cp = 16.56 (J/K)

Total solids  mass = 48.20 (gm)  density = 2.69 (gm/cc)
G = -774673.92 (J)  H = -639655.16 (J)  S = 108.61 (J/K)  V = 17.90 (cc)  Cp = 57.83 (J/K)

Viscosity of the System: 8.32 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.56 (gm/cc)
G = -1613142.27 (J)  H = -1313599.81 (J)  S = 240.95 (J/K)  V = 39.02 (cc)  Cp = 126.78 (J/K)

Oxygen  delta moles = -0.000823008  delta grams = -0.0263353

G = 231.31 (J)  H = -25.75 (J)  S = -0.21 (J/K)  V = -85.07 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 960.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = 0.05  COH = 1.61  IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 48.89 (gm)  density = 2.45 (gm/cc)  viscosity = 6.16 (log 10 poise)  (analysis in wt %)
G = -791134.17 (J)  H = -637207.16 (J)  S = 124.82 (J/K)  V = 19.97 (cc)  Cp = 65.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.75 | 0.81 | 13.62 | 0.51 | 0.00 | 2.10 | 0.21 | 0.27 | 0.00 | 0.00 | 1.98 | 3.29 | 4.19 | 0.21 | 2.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 7.23 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.85Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -94746.20 (J)  H = -75870.33 (J)  S = 15.31 (J/K)  V = 2.03 (cc)  Cp = 8.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.81 | 96.57 | 102.58 | 5.18 | -4.90 | 8.01 | 0.37 |

feldspar  mass = 29.01 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.07Na0.71Ca0.23Al1.23Si2.77O8
G = -479067.11 (J)  H = -396511.29 (J)  S = 66.95 (J/K)  V = 11.15 (cc)  Cp = 35.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.64 | 22.59 | 6.77 |

quartz  mass = 14.84 (gm)  density = 2.56 (gm/cc)
SiO2
G = -245758.13 (J)  H = -205872.54 (J)  S = 32.34 (J/K)  V = 5.80 (cc)  Cp = 17.56 (J/K)

Total solids  mass = 51.08 (gm)  density = 2.69 (gm/cc)
G = -819571.43 (J)  H = -678254.16 (J)  S = 114.60 (J/K)  V = 18.98 (cc)  Cp = 61.21 (J/K)

Viscosity of the System: 9.35 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.57 (gm/cc)
G = -1610705.60 (J)  H = -1315461.32 (J)  S = 239.42 (J/K)  V = 38.95 (cc)  Cp = 126.32 (J/K)

Oxygen  delta moles = -0.000887906  delta grams = -0.0284119
G = 247.32 (J)  H = -27.46 (J)  S = -0.22 (J/K)  V = -91.04 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 950.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = 0.04  COH = 1.58  IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 46.25 (gm)  density = 2.45 (gm/cc)  viscosity = 6.16 (log 10 poise)  (analysis in wt %)
G = -747759.94 (J)  H = -603509.48 (J)  S = 117.93 (J/K)  V = 18.92 (cc)  Cp = 61.60 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.67 0.86 13.61 0.49 0.00 2.00 0.22 0.25 0.00 0.00 1.96 3.21 4.35 0.22 2.17 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.51 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.84Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -97874.54 (J) H = -78530.24 (J) S = 15.82 (J/K) V = 2.10 (cc) Cp = 8.51 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-109.64 96.63 104.31 5.22 -4.93 8.04 0.36

feldspar mass = 30.58 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -504260.96 (J) H = -418298.42 (J) S = 70.28 (J/K) V = 11.75 (cc) Cp = 37.32 (J/K)
albite anorthite sanidine
70.52 22.37 7.11

quartz mass = 15.62 (gm) density = 2.56 (gm/cc)
SiO2
G = -258390.49 (J) H = -216924.12 (J) S = 33.90 (J/K) V = 6.11 (cc) Cp = 18.47 (J/K)

Total solids mass = 53.71 (gm) density = 2.69 (gm/cc)
G = -860525.99 (J) H = -713752.78 (J) S = 120.00 (J/K) V = 19.96 (cc) Cp = 64.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1608285.93 (J) H = -1317262.27 (J) S = 237.93 (J/K) V = 38.88 (cc) Cp = 125.90 (J/K)

Oxygen delta moles = -0.000949371 delta grams = -0.0303787
G = 262.05 (J) H = -29.03 (J) S = -0.24 (J/K) V = -96.55 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 940.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.03 COH = 1.56 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 43.82 (gm) density = 2.44 (gm/cc) viscosity = 6.17 (log 10 poise) (analysis in wt %)
G = -707880.69 (J) H = -572493.01 (J) S = 111.60 (J/K) V = 17.95 (cc) Cp = 58.36 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.57 0.91 13.60 0.47 0.00 1.89 0.23 0.23 0.00 0.00 1.94 3.13 4.51 0.23 2.29 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.77 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.82Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -100658.73 (J) H = -80931.06 (J) S = 16.26 (J/K) V = 2.17 (cc) Cp = 8.78 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-111.26 96.68 105.85 5.26 -4.95 8.05 0.36

feldspar mass = 32.03 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.07Na0.70Ca0.22Al1.22Si2.78O8
G = -527352.19 (J) H = -438431.85 (J) S = 73.30 (J/K) V = 12.31 (cc) Cp = 39.05 (J/K)
albite anorthite sanidine
70.38 22.18 7.45

quartz mass = 16.35 (gm) density = 2.56 (gm/cc)
SiO2
G = -269991.30 (J) H = -227153.51 (J) S = 35.31 (J/K) V = 6.39 (cc) Cp = 19.31 (J/K)

Total solids mass = 56.14 (gm) density = 2.69 (gm/cc)
G = -898002.21 (J) H = -746516.41 (J) S = 124.87 (J/K) V = 20.87 (cc) Cp = 67.13 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1605882.91 (J) H = -1319009.43 (J) S = 236.47 (J/K) V = 38.81 (cc) Cp = 125.50 (J/K)

Oxygen delta moles = -0.00100739 delta grams = -0.0322354
G = 275.55 (J) H = -30.44 (J) S = -0.25 (J/K) V = -101.61 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 930.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.02 COH = 1.53 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 41.32 (gm) density = 2.44 (gm/cc) viscosity = 6.17 (log 10 poise) (analysis in wt %)
G = -667135.55 (J) H = -540649.16 (J) S = 105.13 (J/K) V = 16.96 (cc) Cp = 55.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.56 | 0.84 | 13.61 | 0.44 | 0.00 | 1.76 | 0.24 | 0.21 | 0.00 | 0.00 | 1.92 | 3.06 | 4.68 | 0.24 | 2.43 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.93 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.07Mg0.81Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -102356.50 (J) H = -82488.90 (J) S = 16.51 (J/K) V = 2.21 (cc) Cp = 8.94 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-112.17 96.71 106.81 5.25 -4.96 8.01 0.35

feldspar mass = 33.49 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -550499.91 (J) H = -458697.44 (J) S = 76.30 (J/K) V = 12.86 (cc) Cp = 40.79 (J/K)
albite anorthite sanidine
70.12 22.02 7.87

quartz mass = 17.12 (gm) density = 2.56 (gm/cc)
SiO2
G = -282442.04 (J) H = -238141.43 (J) S = 36.82 (J/K) V = 6.70 (cc) Cp = 20.21 (J/K)

rhm-oxide mass = 0.11 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.20Al0.12Ti0.84O3
G = -1074.19 (J) H = -821.67 (J) S = 0.21 (J/K) V = 0.02 (cc) Cp = 0.10 (J/K)

geikielite hematite ilmenite pyrophanite corundum
9.21 10.05 71.61 3.17 5.96

Total solids mass = 58.65 (gm) density = 2.69 (gm/cc)
G = -936372.65 (J) H = -780149.43 (J) S = 129.85 (J/K) V = 21.80 (cc) Cp = 70.04 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1603508.19 (J) H = -1320798.59 (J) S = 234.97 (J/K) V = 38.75 (cc) Cp = 125.07 (J/K)

Oxygen delta moles = -0.00104022 delta grams = -0.0332857
G = 281.92 (J) H = -31.06 (J) S = -0.26 (J/K) V = -104.06 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 920.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.02 COH = 1.50 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 39.05 (gm) density = 2.43 (gm/cc) viscosity = 6.17 (log 10 poise) (analysis in wt %)
G = -630144.50 (J) H = -511706.55 (J) S = 99.26 (J/K) V = 16.06 (cc) Cp = 52.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.53 | 0.79 | 13.62 | 0.42 | 0.00 | 1.64 | 0.25 | 0.20 | 0.00 | 0.00 | 1.90 | 2.99 | 4.84 | 0.26 | 2.57 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.08 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.81Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -103907.12 (J) H = -83937.06 (J) S = 16.74 (J/K) V = 2.25 (cc) Cp = 9.09 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-113.02 96.74 107.70 5.25 -4.97 7.96 0.34

feldspar mass = 34.83 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -571541.18 (J) H = -477290.33 (J) S = 78.99 (J/K) V = 13.38 (cc) Cp = 42.37 (J/K)
albite anorthite sanidine
69.86 21.86 8.28

quartz mass = 17.82 (gm) density = 2.56 (gm/cc)
SiO2
G = -293666.12 (J) H = -248137.78 (J) S = 38.16 (J/K) V = 6.97 (cc) Cp = 21.02 (J/K)

rhm-oxide mass = 0.19 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.20Al0.12Ti0.84O3
G = -1888.44 (J) H = -1448.92 (J) S = 0.37 (J/K) V = 0.04 (cc) Cp = 0.18 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.04 9.94 71.89 3.30 5.83

Total solids mass = 60.92 (gm) density = 2.69 (gm/cc)
G = -971002.86 (J) H = -810814.09 (J) S = 134.26 (J/K) V = 22.64 (cc) Cp = 72.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1601147.36 (J) H = -1322520.64 (J) S = 233.52 (J/K) V = 38.69 (cc) Cp = 124.68 (J/K)

Oxygen delta moles = -0.00107461 delta grams = -0.0343862
G = 288.56 (J) H = -31.71 (J) S = -0.27 (J/K) V = -106.60 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 910.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.01 COH = 1.48 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 36.95 (gm) density = 2.43 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -595953.17 (J) H = -484909.39 (J) S = 93.85 (J/K) V = 15.22 (cc) Cp = 49.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.47 | 0.75 | 13.63 | 0.39 | 0.00 | 1.53 | 0.26 | 0.19 | 0.00 | 0.00 | 1.89 | 2.92 | 4.99 | 0.27 | 2.72 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.21 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.80Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -105242.96 (J) H = -85221.54 (J) S = 16.92 (J/K) V = 2.28 (cc) Cp = 9.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.76 | 96.77 | 108.49 | 5.24 | -4.98 | 7.90 | 0.34 |

feldspar mass = 36.07 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.22Al1.22Si2.78O8
G = -590975.74 (J) H = -494616.85 (J) S = 81.44 (J/K) V = 13.85 (cc) Cp = 43.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.58 | 21.70 | 8.71 |

quartz mass = 18.48 (gm) density = 2.56 (gm/cc)
SiO2
G = -304028.63 (J) H = -257445.00 (J) S = 39.37 (J/K) V = 7.23 (cc) Cp = 21.77 (J/K)

rhm-oxide mass = 0.26 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe"'0.20Al0.11Ti0.84O3
G = -2601.12 (J) H = -2001.90 (J) S = 0.51 (J/K) V = 0.06 (cc) Cp = 0.25 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.89 | 9.81 | 72.17 | 3.43 | 5.70 |

Total solids mass = 63.02 (gm) density = 2.69 (gm/cc)
G = -1002848.44 (J) H = -839285.29 (J) S = 138.24 (J/K) V = 23.42 (cc) Cp = 75.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1598801.61 (J) H = -1324194.68 (J) S = 232.10 (J/K) V = 38.64 (cc) Cp = 124.31 (J/K)

Oxygen delta moles = -0.00110773 delta grams = -0.0354462

G = 294.69 (J)  H = -32.29 (J)  S = -0.28 (J/K)  V = -108.97 (cc)  Cp = -0.04 (J/K)

**********_____**********
Title: f8a2

T = 900.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = -0.00  COH = 1.45
IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid  mass = 35.00 (gm)  density = 2.42 (gm/cc)  viscosity = 6.15 (log 10 poise)  (analysis in wt %)
G = -564194.83 (J)  H = -459973.04 (J)  S = 88.84 (J/K)  V = 14.44 (cc)  Cp = 46.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.40 | 0.70 | 13.64 | 0.37 | 0.00 | 1.42 | 0.27 | 0.18 | 0.00 | 0.00 | 1.88 | 2.85 | 5.14 | 0.29 | 2.87 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.32 (gm)  density = 3.60 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.09Mg0.79Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -106390.08 (J)  H = -86361.84 (J)  S = 17.07 (J/K)  V = 2.31 (cc)  Cp = 9.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.40 | 96.79 | 109.18 | 5.24 | -4.99 | 7.84 | 0.33 |

feldspar  mass = 37.23 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -609015.18 (J)  H = -510845.48 (J)  S = 83.68 (J/K)  V = 14.30 (cc)  Cp = 45.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.30 | 21.56 | 9.15 |

quartz  mass = 19.09 (gm)  density = 2.56 (gm/cc)
SiO2
G = -313643.42 (J)  H = -266154.94 (J)  S = 40.48 (J/K)  V = 7.46 (cc)  Cp = 22.47 (J/K)

rhm-oxide  mass = 0.33 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.72Mg0.09Fe'"0.19Al0.11Ti0.85O3
G = -3227.17 (J)  H = -2491.48 (J)  S = 0.63 (J/K)  V = 0.07 (cc)  Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.74 | 9.67 | 72.44 | 3.55 | 5.58 |

Total solids  mass = 64.97 (gm)  density = 2.69 (gm/cc)
G = -1032275.84 (J)  H = -865853.73 (J)  S = 141.86 (J/K)  V = 24.15 (cc)  Cp = 77.31 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.59 (gm/cc)
G = -1596470.68 (J)  H = -1325826.78 (J)  S = 230.70 (J/K)  V = 38.59 (cc)  Cp = 123.96 (J/K)

Oxygen  delta moles = -0.00113957  delta grams = -0.036465
G = 300.32 (J)  H = -32.81 (J)  S = -0.28 (J/K)  V = -111.15 (cc)  Cp = -0.04 (J/K)

**********_____**********
Title: f8a2

T = 890.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.07  delta HM = -5.05  NNO = 0.00  QFM = -0.01  COH = 1.42

IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 33.17 (gm) density = 2.42 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -534555.52 (J) H = -436653.52 (J) S = 84.17 (J/K) V = 13.72 (cc) Cp = 44.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.32 | 0.66 | 13.65 | 0.35 | 0.00 | 1.32 | 0.28 | 0.17 | 0.00 | 0.00 | 1.87 | 2.78 | 5.27 | 0.30 | 3.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.42 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.10Mg0.79Fe'''0.03Ti0.00Al0.13Si1.92O6
G = -107371.72 (J) H = -87375.33 (J) S = 17.19 (J/K) V = 2.34 (cc) Cp = 9.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.96 | 96.82 | 109.80 | 5.24 | -5.00 | 7.77 | 0.33 |

feldspar mass = 38.32 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -625841.07 (J) H = -526121.02 (J) S = 85.73 (J/K) V = 14.71 (cc) Cp = 46.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.00 | 21.41 | 9.59 |

quartz mass = 19.66 (gm) density = 2.56 (gm/cc)
SiO2
G = -322607.13 (J) H = -274345.67 (J) S = 41.49 (J/K) V = 7.69 (cc) Cp = 23.12 (J/K)

rhm-oxide mass = 0.39 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'''0.19Al0.11Ti0.85O3
G = -3778.90 (J) H = -2926.58 (J) S = 0.73 (J/K) V = 0.08 (cc) Cp = 0.36 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.61 | 9.53 | 72.72 | 3.68 | 5.47 |

Total solids mass = 66.79 (gm) density = 2.69 (gm/cc)
G = -1059598.82 (J) H = -890768.61 (J) S = 145.15 (J/K) V = 24.82 (cc) Cp = 79.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1594154.34 (J) H = -1327422.12 (J) S = 229.32 (J/K) V = 38.54 (cc) Cp = 123.64 (J/K)

Oxygen delta moles = -0.00117013 delta grams = -0.0374429
G = 305.46 (J) H = -33.28 (J) S = -0.29 (J/K) V = -113.16 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 880.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.02 COH = 1.39
IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 31.47 (gm) density = 2.41 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -506764.47 (J) H = -414740.04 (J) S = 79.80 (J/K) V = 13.03 (cc) Cp = 41.99 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.22 0.62 13.67 0.33 0.00 1.22 0.29 0.16 0.00 0.00 1.86 2.72 5.41 0.32 3.19 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.51 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.10Mg0.78Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -108208.50 (J) H = -88277.48 (J) S = 17.28 (J/K) V = 2.36 (cc) Cp = 9.52 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-115.45 96.85 110.35 5.24 -5.01 7.70 0.32

feldspar mass = 39.35 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -641610.36 (J) H = -540568.87 (J) S = 87.62 (J/K) V = 15.11 (cc) Cp = 47.68 (J/K)
albite anorthite sanidine
68.69 21.27 10.05

quartz mass = 20.20 (gm) density = 2.56 (gm/cc)
SiO2
G = -331002.59 (J) H = -282084.18 (J) S = 42.42 (J/K) V = 7.90 (cc) Cp = 23.73 (J/K)

rhm-oxide mass = 0.44 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.08Fe'"0.19Al0.11Ti0.85O3
G = -4266.50 (J) H = -3314.61 (J) S = 0.83 (J/K) V = 0.09 (cc) Cp = 0.41 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.48 9.37 72.99 3.80 5.36

Total solids mass = 68.49 (gm) density = 2.69 (gm/cc)
G = -1085087.95 (J) H = -914245.14 (J) S = 148.15 (J/K) V = 25.46 (cc) Cp = 81.33 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1591852.42 (J) H = -1328985.18 (J) S = 227.96 (J/K) V = 38.50 (cc) Cp = 123.32 (J/K)

Oxygen delta moles = -0.00119943 delta grams = -0.0383802
G = 310.12 (J) H = -33.68 (J) S = -0.30 (J/K) V = -115.00 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 29.86 (gm) density = 2.41 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -480586.44 (J) H = -394049.14 (J) S = 75.70 (J/K) V = 12.39 (cc) Cp = 39.86 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.10 0.58 13.68 0.31 0.00 1.14 0.31 0.15 0.00 0.00 1.85 2.66 5.53 0.34 3.36 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.59 (gm) density = 3.61 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.11Mg0.78Fe'''0.03Ti0.00Al0.13Si1.92O6
G = -108918.66 (J) H = -89081.98 (J) S = 17.35 (J/K) V = 2.38 (cc) Cp = 9.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.87 | 96.88 | 110.83 | 5.24 | -5.02 | 7.63 | 0.32 |

feldspar mass = 40.32 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -656459.72 (J) H = -554298.48 (J) S = 89.37 (J/K) V = 15.48 (cc) Cp = 48.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.36 | 21.13 | 10.51 |

quartz mass = 20.70 (gm) density = 2.56 (gm/cc)
SiO2
G = -338901.47 (J) H = -289428.52 (J) S = 43.28 (J/K) V = 8.10 (cc) Cp = 24.30 (J/K)

rhm-oxide mass = 0.48 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.08Fe'''0.18Al0.11Ti0.86O3
G = -4698.45 (J) H = -3661.71 (J) S = 0.91 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.36 | 9.21 | 73.26 | 3.91 | 5.25 |

Total solids mass = 70.10 (gm) density = 2.69 (gm/cc)
G = -1108978.29 (J) H = -936470.69 (J) S = 150.91 (J/K) V = 26.06 (cc) Cp = 83.16 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1589564.74 (J) H = -1330519.83 (J) S = 226.61 (J/K) V = 38.45 (cc) Cp = 123.03 (J/K)

Oxygen delta moles = -0.00122748 delta grams = -0.0392778
G = 314.32 (J) H = -34.04 (J) S = -0.30 (J/K) V = -116.67 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 28.34 (gm) density = 2.41 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -455815.51 (J) H = -374419.75 (J) S = 71.83 (J/K) V = 11.78 (cc) Cp = 37.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.96 | 0.55 | 13.70 | 0.29 | 0.00 | 1.06 | 0.32 | 0.14 | 0.00 | 0.00 | 1.85 | 2.60 | 5.64 | 0.35 | 3.54 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.66 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.11Mg0.78Fe'''0.03Ti0.00Al0.13Si1.92O6
G = -109518.29 (J) H = -89800.95 (J) S = 17.40 (J/K) V = 2.40 (cc) Cp = 9.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.25 | 96.90 | 111.26 | 5.24 | -5.03 | 7.56 | 0.31 |

feldspar mass = 41.25 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -670509.05 (J) H = -567406.12 (J) S = 90.99 (J/K) V = 15.84 (cc) Cp = 49.91 (J/K)
albite anorthite sanidine
68.02 20.99 10.99

quartz mass = 21.19 (gm) density = 2.56 (gm/cc)
SiO2
G = -346366.45 (J) H = -296429.58 (J) S = 44.07 (J/K) V = 8.28 (cc) Cp = 24.84 (J/K)

rhm-oxide mass = 0.52 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.08Fe'"0.18Al0.10Ti0.86O3
G = -5081.85 (J) H = -3973.04 (J) S = 0.98 (J/K) V = 0.11 (cc) Cp = 0.49 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.25 9.05 73.53 4.02 5.15

Total solids mass = 71.62 (gm) density = 2.69 (gm/cc)
G = -1131475.64 (J) H = -957609.68 (J) S = 153.44 (J/K) V = 26.63 (cc) Cp = 84.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1587291.16 (J) H = -1332029.44 (J) S = 225.27 (J/K) V = 38.41 (cc) Cp = 122.74 (J/K)

Oxygen delta moles = -0.00125432 delta grams = -0.0401367
G = 318.08 (J) H = -34.34 (J) S = -0.31 (J/K) V = -118.17 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 850.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.05 COH = 1.30 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 26.80 (gm) density = 2.40 (gm/cc) viscosity = 6.00 (log 10 poise) (analysis in wt %)
G = -430825.71 (J) H = -354468.17 (J) S = 67.99 (J/K) V = 11.16 (cc) Cp = 35.82 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.92 0.51 13.54 0.27 0.00 0.96 0.33 0.14 0.00 0.00 1.86 2.63 5.72 0.37 3.74 0.00 0.00 0.00 0.00

garnet mass = 1.00 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.62Mg0.21)3Al2Si3O12
G = -13298.83 (J) H = -11124.14 (J) S = 1.94 (J/K) V = 0.25 (cc) Cp = 1.07 (J/K)
almandine grossular pyrope
62.42 16.69 20.88

orthopyroxene mass = 8.05 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.10Mg0.80Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -102058.63 (J) H = -83964.61 (J) S = 16.11 (J/K) V = 2.23 (cc) Cp = 8.98 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-114.13 96.80 109.71 5.00 -4.81 7.11 0.31

feldspar mass = 41.76 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.12Na0.68Ca0.20Al1.20Si2.80O8
G = -677457.78 (J) H = -574505.88 (J) S = 91.66 (J/K) V = 16.03 (cc) Cp = 50.48 (J/K)
albite anorthite sanidine
67.88 20.37 11.75

quartz mass = 21.80 (gm) density = 2.56 (gm/cc)
SiO2
G = -355958.00 (J) H = -305280.88 (J) S = 45.12 (J/K) V = 8.53 (cc) Cp = 25.53 (J/K)

rhm-oxide mass = 0.56 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.08Fe'"0.17Al0.10Ti0.86O3
G = -5413.27 (J) H = -4247.07 (J) S = 1.04 (J/K) V = 0.12 (cc) Cp = 0.52 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.44 8.72 73.68 4.20 4.96

Total solids mass = 73.16 (gm) density = 2.69 (gm/cc)
G = -1154186.51 (J) H = -979122.59 (J) S = 155.87 (J/K) V = 27.16 (cc) Cp = 86.59 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1585012.21 (J) H = -1333590.77 (J) S = 223.85 (J/K) V = 38.33 (cc) Cp = 122.41 (J/K)

Oxygen delta moles = -0.00131738 delta grams = -0.0421544
G = 330.81 (J) H = -35.60 (J) S = -0.33 (J/K) V = -123.02 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 840.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.06 COH = 1.27 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 25.12 (gm) density = 2.39 (gm/cc) viscosity = 5.91 (log 10 poise) (analysis in wt %)
G = -403782.10 (J) H = -332677.68 (J) S = 63.88 (J/K) V = 10.49 (cc) Cp = 33.62 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.85 0.48 13.35 0.25 0.00 0.87 0.35 0.14 0.00 0.00 1.89 2.70 5.73 0.40 3.99 0.00 0.00 0.00 0.00

garnet mass = 2.08 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.62Mg0.21)3Al2Si3O12
G = -27748.41 (J) H = -23275.02 (J) S = 4.02 (J/K) V = 0.52 (cc) Cp = 2.23 (J/K)
almandine grossular pyrope
61.73 17.28 20.98

orthopyroxene mass = 7.38 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.82Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -93922.52 (J) H = -77541.85 (J) S = 14.72 (J/K) V = 2.05 (cc) Cp = 8.25 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-111.51 96.69 107.69 4.75 -4.57 6.63 0.32

feldspar mass = 41.74 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.12Na0.68Ca0.20Al1.20Si2.80O8
G = -676123.61 (J) H = -574610.06 (J) S = 91.19 (J/K) V = 16.03 (cc) Cp = 50.44 (J/K)
albite anorthite sanidine
67.95 19.87 12.18

feldspar mass = 0.58 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.63Na0.34Ca0.03Al1.03Si2.97O8
G = -9199.04 (J) H = -7800.91 (J) S = 1.26 (J/K) V = 0.23 (cc) Cp = 0.69 (J/K)
albite anorthite sanidine
34.40 2.68 62.92

quartz mass = 22.46 (gm) density = 2.56 (gm/cc)
SiO2
G = -366230.31 (J) H = -314751.29 (J) S = 46.25 (J/K) V = 8.78 (cc) Cp = 26.28 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.17Al0.10Ti0.87O3
G = -5742.94 (J) H = -4521.99 (J) S = 1.10 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.70 8.36 73.78 4.38 4.78

Total solids mass = 74.83 (gm) density = 2.70 (gm/cc)
G = -1178966.81 (J) H = -1002501.13 (J) S = 158.53 (J/K) V = 27.75 (cc) Cp = 88.44 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1582748.91 (J) H = -1335178.81 (J) S = 222.40 (J/K) V = 38.24 (cc) Cp = 122.07 (J/K)

Oxygen delta moles = -0.00137785 delta grams = -0.0440895
G = 342.59 (J) H = -36.75 (J) S = -0.34 (J/K) V = -127.52 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 23.17 (gm) density = 2.39 (gm/cc) viscosity = 5.76 (log 10 poise) (analysis in wt %)
G = -372476.44 (J) H = -307176.82 (J) S = 59.19 (J/K) V = 9.71 (cc) Cp = 31.07 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.75 0.44 13.12 0.24 0.00 0.81 0.37 0.14 0.00 0.00 1.92 2.86 5.59 0.43 4.33 0.00 0.00 0.00 0.00

garnet mass = 3.13 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -41819.63 (J) H = -35174.23 (J) S = 6.02 (J/K) V = 0.79 (cc) Cp = 3.36 (J/K)
almandine grossular pyrope
61.03 17.78 21.19

orthopyroxene mass = 6.73 (gm) density = 3.59 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"1.05Mg0.85Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -85982.47 (J) H = -71240.68 (J) S = 13.36 (J/K) V = 1.88 (cc) Cp = 7.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.66 | 96.59 | 105.38 | 4.53 | -4.36 | 6.19 | 0.32 |

feldspar mass = 40.75 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.68Ca0.20Al1.20Si2.80O8
G = -659309.44 (J) H = -561576.23 (J) S = 88.59 (J/K) V = 15.65 (cc) Cp = 49.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.48 | 19.78 | 11.74 |

feldspar mass = 2.37 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -37205.63 (J) H = -31622.19 (J) S = 5.06 (J/K) V = 0.93 (cc) Cp = 2.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.76 | 2.49 | 63.74 |

quartz mass = 23.19 (gm) density = 2.56 (gm/cc)
SiO2
G = -377613.70 (J) H = -325214.99 (J) S = 47.50 (J/K) V = 9.07 (cc) Cp = 27.10 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.09Fe'"0.16Al0.09Ti0.87O3
G = -6097.14 (J) H = -4818.51 (J) S = 1.16 (J/K) V = 0.14 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.00 | 7.98 | 73.84 | 4.54 | 4.63 |

Total solids mass = 76.78 (gm) density = 2.70 (gm/cc)
G = -1208028.01 (J) H = -1029646.84 (J) S = 161.70 (J/K) V = 28.44 (cc) Cp = 90.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1580504.44 (J) H = -1336823.66 (J) S = 220.90 (J/K) V = 38.15 (cc) Cp = 121.70 (J/K)

Oxygen delta moles = -0.00143099 delta grams = -0.04579
G = 352.26 (J) H = -37.66 (J) S = -0.35 (J/K) V = -131.25 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 820.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.08 COH = 1.21 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 21.35 (gm) density = 2.38 (gm/cc) viscosity = 5.59 (log 10 poise) (analysis in wt %)
G = -343345.59 (J) H = -283397.29 (J) S = 54.84 (J/K) V = 8.98 (cc) Cp = 28.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.56 | 0.40 | 12.98 | 0.23 | 0.00 | 0.74 | 0.40 | 0.14 | 0.00 | 0.00 | 1.93 | 3.03 | 5.44 | 0.47 | 4.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.19 (gm) density = 3.95 (gm/cc) (analysis in mole %)

(Ca0.18Fe"0.61Mg0.22)3Al2Si3O12
G = -55962.17 (J) H = -47191.59 (J) S = 8.02 (J/K) V = 1.06 (cc) Cp = 4.49 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.55 | 17.82 | 21.63 |

orthopyroxene mass = 5.97 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.87Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -76628.18 (J) H = -63717.13 (J) S = 11.81 (J/K) V = 1.67 (cc) Cp = 6.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.97 | 96.62 | 103.00 | 4.39 | -4.22 | 5.86 | 0.32 |

clinopyroxene mass = 0.19 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.81Fe"0.40Mg0.53Fe'"0.06Ti0.04Al0.22Si1.86O6
G = -2656.87 (J) H = -2256.96 (J) S = 0.37 (J/K) V = 0.05 (cc) Cp = 0.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.02 | 10.80 | 40.01 | 8.47 | -0.03 | 5.57 | 8.15 |

feldspar mass = 39.79 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.69Ca0.19Al1.19Si2.81O8
G = -643070.50 (J) H = -548949.04 (J) S = 86.10 (J/K) V = 15.28 (cc) Cp = 48.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.18 | 19.39 | 11.43 |

feldspar mass = 3.92 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.33Ca0.02Al1.02Si2.98O8
G = -61589.72 (J) H = -52464.64 (J) S = 8.35 (J/K) V = 1.54 (cc) Cp = 4.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.36 | 2.31 | 64.33 |

quartz mass = 23.90 (gm) density = 2.56 (gm/cc)
SiO2
G = -388680.87 (J) H = -335446.10 (J) S = 48.70 (J/K) V = 9.34 (cc) Cp = 27.90 (J/K)

rhm-oxide mass = 0.65 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.09Fe'"0.15Al0.09Ti0.88O3
G = -6347.91 (J) H = -5035.41 (J) S = 1.20 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.34 | 7.60 | 73.82 | 4.70 | 4.54 |

Total solids mass = 78.60 (gm) density = 2.70 (gm/cc)
G = -1234936.22 (J) H = -1055060.87 (J) S = 164.55 (J/K) V = 29.09 (cc) Cp = 92.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1578281.81 (J) H = -1338458.17 (J) S = 219.39 (J/K) V = 38.07 (cc) Cp = 121.35 (J/K)

Oxygen delta moles = -0.0014713 delta grams = -0.0470797
G = 358.55 (J) H = -38.20 (J) S = -0.36 (J/K) V = -133.72 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 810.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.09 COH = 1.18

IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 19.65 (gm) density = 2.37 (gm/cc) viscosity = 5.42 (log 10 poise) (analysis in wt %)
G = -316155.11 (J) H = -261144.82 (J) S = 50.79 (J/K) V = 8.29 (cc) Cp = 26.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.29 | 0.36 | 12.86 | 0.21 | 0.00 | 0.69 | 0.43 | 0.14 | 0.00 | 0.00 | 1.92 | 3.20 | 5.27 | 0.51 | 5.11 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.17 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -69150.57 (J) H = -58461.18 (J) S = 9.87 (J/K) V = 1.31 (cc) Cp = 5.55 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.14 | 17.71 | 22.15 |

orthopyroxene mass = 5.23 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.90Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -67474.41 (J) H = -56303.80 (J) S = 10.31 (J/K) V = 1.47 (cc) Cp = 5.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.38 | 96.68 | 100.64 | 4.27 | -4.11 | 5.57 | 0.33 |

clinopyroxene mass = 0.41 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.38Mg0.55Fe'"0.05Ti0.04Al0.22Si1.86O6
G = -5886.84 (J) H = -5016.67 (J) S = 0.80 (J/K) V = 0.12 (cc) Cp = 0.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.91 | 10.22 | 37.87 | 8.59 | 0.01 | 5.12 | 8.28 |

feldspar mass = 38.92 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.70Ca0.19Al1.19Si2.81O8
G = -628149.54 (J) H = -537384.47 (J) S = 83.80 (J/K) V = 14.94 (cc) Cp = 47.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.92 | 18.94 | 11.14 |

feldspar mass = 5.33 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -83537.24 (J) H = -71319.98 (J) S = 11.28 (J/K) V = 2.10 (cc) Cp = 6.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.98 | 2.14 | 64.87 |

quartz mass = 24.57 (gm) density = 2.56 (gm/cc)
SiO2
G = -399184.20 (J) H = -345228.64 (J) S = 49.81 (J/K) V = 9.61 (cc) Cp = 28.66 (J/K)

rhm-oxide mass = 0.67 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.10Fe'"0.14Al0.09Ti0.88O3
G = -6539.57 (J) H = -5206.72 (J) S = 1.23 (J/K) V = 0.14 (cc) Cp = 0.62 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.68 | 7.23 | 73.78 | 4.85 | 4.46 |

Total solids mass = 80.30 (gm) density = 2.71 (gm/cc)
G = -1259922.37 (J) H = -1078921.46 (J) S = 167.11 (J/K) V = 29.69 (cc) Cp = 94.54 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1576077.47 (J) H = -1340066.28 (J) S = 217.89 (J/K) V = 37.98 (cc) Cp = 121.04 (J/K)

Oxygen delta moles = -0.00150545 delta grams = -0.0481726
G = 363.16 (J) H = -38.56 (J) S = -0.37 (J/K) V = -135.58 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 18.05 (gm) density = 2.36 (gm/cc) viscosity = 5.22 (log 10 poise) (analysis in wt %)
G = -290579.78 (J) H = -240152.57 (J) S = 46.99 (J/K) V = 7.65 (cc) Cp = 24.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.96 | 0.32 | 12.75 | 0.20 | 0.00 | 0.64 | 0.46 | 0.14 | 0.00 | 0.00 | 1.93 | 3.39 | 5.10 | 0.56 | 5.56 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.07 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.23)3Al2Si3O12
G = -81135.37 (J) H = -68766.63 (J) S = 11.53 (J/K) V = 1.54 (cc) Cp = 6.51 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.74 | 17.60 | 22.66 |

orthopyroxene mass = 4.56 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.93Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -59087.85 (J) H = -49477.22 (J) S = 8.96 (J/K) V = 1.28 (cc) Cp = 5.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.82 | 96.73 | 98.30 | 4.16 | -4.00 | 5.30 | 0.33 |

clinopyroxene mass = 0.61 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.36Mg0.56Fe'"0.05Ti0.04Al0.22Si1.87O6
G = -8894.22 (J) H = -7603.14 (J) S = 1.20 (J/K) V = 0.18 (cc) Cp = 0.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.65 | 9.68 | 35.81 | 8.71 | 0.04 | 4.69 | 8.41 |

feldspar mass = 38.14 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.71Ca0.19Al1.19Si2.81O8
G = -614795.90 (J) H = -527109.49 (J) S = 81.71 (J/K) V = 14.64 (cc) Cp = 46.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.65 | 18.51 | 10.85 |

feldspar mass = 6.62 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -103569.21 (J) H = -88620.20 (J) S = 13.93 (J/K) V = 2.60 (cc) Cp = 7.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.58 | 1.98 | 65.45 |

quartz mass = 25.22 (gm) density = 2.56 (gm/cc)

SiO2
G = -409133.45 (J)  H = -354567.92 (J)  S = 50.85 (J/K)  V = 9.86 (cc)  Cp = 29.37 (J/K)

rhm-oxide  mass = 0.69 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.74Mg0.10Fe'"0.14Al0.09Ti0.89O3
G = -6694.09 (J)  H = -5349.35 (J)  S = 1.25 (J/K)  V = 0.15 (cc)  Cp = 0.63 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.03 | 6.88 | 73.72 | 4.98 | 4.39 |

Total solids  mass = 81.90 (gm)  density = 2.71 (gm/cc)
G = -1283310.09 (J)  H = -1101493.95 (J)  S = 169.42 (J/K)  V = 30.25 (cc)  Cp = 96.34 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.64 (gm/cc)
G = -1573889.87 (J)  H = -1341646.52 (J)  S = 216.41 (J/K)  V = 37.90 (cc)  Cp = 120.76 (J/K)

Oxygen  delta moles = -0.0015361  delta grams = -0.0491533
G = 366.77 (J)  H = -38.80 (J)  S = -0.38 (J/K)  V = -137.06 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 790.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.09  delta HM = -5.14  NNO = 0.00  QFM = -0.11  COH = 1.11
IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid  mass = 16.53 (gm)  density = 2.35 (gm/cc)  viscosity = 5.00 (log 10 poise)  (analysis in wt %)
G = -266273.49 (J)  H = -220136.82 (J)  S = 43.40 (J/K)  V = 7.03 (cc)  Cp = 22.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.53 | 0.29 | 12.64 | 0.19 | 0.00 | 0.59 | 0.50 | 0.14 | 0.00 | 0.00 | 1.94 | 3.59 | 4.91 | 0.61 | 6.07 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 6.89 (gm)  density = 3.95 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -92090.66 (J)  H = -78247.96 (J)  S = 13.02 (J/K)  V = 1.74 (cc)  Cp = 7.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.35 | 17.47 | 23.18 |

orthopyroxene  mass = 3.95 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.95Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -51355.48 (J)  H = -43150.00 (J)  S = 7.72 (J/K)  V = 1.11 (cc)  Cp = 4.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.29 | 96.79 | 95.99 | 4.03 | -3.88 | 5.04 | 0.33 |

clinopyroxene  mass = 0.81 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.82Fe"0.34Mg0.58Fe'"0.04Ti0.04Al0.22Si1.87O6
G = -11708.99 (J)  H = -10039.89 (J)  S = 1.57 (J/K)  V = 0.24 (cc)  Cp = 0.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.26 | 9.17 | 33.83 | 8.82 | 0.09 | 4.28 | 8.54 |

feldspar  mass = 37.44 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.11Na0.71Ca0.18Al1.18Si2.82O8
G = -602852.21 (J) H = -517997.56 (J) S = 79.81 (J/K) V = 14.37 (cc) Cp = 45.40 (J/K)
albite anorthite sanidine
71.36 18.09 10.55

feldspar mass = 7.81 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -121952.37 (J) H = -104583.13 (J) S = 16.34 (J/K) V = 3.07 (cc) Cp = 9.22 (J/K)
albite anorthite sanidine
32.14 1.82 66.04

quartz mass = 25.84 (gm) density = 2.56 (gm/cc)
SiO2
G = -418668.30 (J) H = -363582.16 (J) S = 51.81 (J/K) V = 10.10 (cc) Cp = 30.06 (J/K)

rhm-oxide mass = 0.70 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.10Fe'"0.13Al0.09Ti0.89O3
G = -6817.11 (J) H = -5467.49 (J) S = 1.27 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.38 6.54 73.65 5.10 4.33

Total solids mass = 83.42 (gm) density = 2.71 (gm/cc)
G = -1305445.12 (J) H = -1123068.19 (J) S = 171.54 (J/K) V = 30.79 (cc) Cp = 98.07 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1571718.61 (J) H = -1343205.01 (J) S = 214.94 (J/K) V = 37.82 (cc) Cp = 120.51 (J/K)

Oxygen delta moles = -0.00156377 delta grams = -0.0500387
G = 369.54 (J) H = -38.95 (J) S = -0.38 (J/K) V = -138.23 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 780.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.12 COH = 1.07 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 15.07 (gm) density = 2.34 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -242892.20 (J) H = -200812.97 (J) S = 39.96 (J/K) V = 6.44 (cc) Cp = 20.55 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.99 0.25 12.52 0.18 0.00 0.55 0.55 0.15 0.00 0.00 1.96 3.83 4.70 0.67 6.66 0.00 0.00 0.00 0.00

garnet mass = 7.64 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -102165.82 (J) H = -87025.70 (J) S = 14.38 (J/K) V = 1.94 (cc) Cp = 8.19 (J/K)
almandine grossular pyrope
58.95 17.33 23.71

orthopyroxene mass = 3.38 (gm) density = 3.54 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.94Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -44181.79 (J) H = -37248.12 (J) S = 6.58 (J/K) V = 0.95 (cc) Cp = 3.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.80 | 96.84 | 93.69 | 3.91 | -3.77 | 4.79 | 0.34 |

clinopyroxene mass = 0.98 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.32Mg0.60Fe'"0.04Ti0.05Al0.21Si1.87O6
G = -14354.54 (J) H = -12345.13 (J) S = 1.91 (J/K) V = 0.29 (cc) Cp = 1.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.74 | 8.69 | 31.93 | 8.94 | 0.14 | 3.89 | 8.67 |

feldspar mass = 36.82 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.72Ca0.18Al1.18Si2.82O8
G = -592191.46 (J) H = -509947.22 (J) S = 78.09 (J/K) V = 14.13 (cc) Cp = 44.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.06 | 17.69 | 10.25 |

feldspar mass = 8.91 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -138932.85 (J) H = -119410.92 (J) S = 18.54 (J/K) V = 3.50 (cc) Cp = 10.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.66 | 1.67 | 66.66 |

quartz mass = 26.44 (gm) density = 2.56 (gm/cc)
SiO2
G = -427931.59 (J) H = -372393.32 (J) S = 52.74 (J/K) V = 10.34 (cc) Cp = 30.73 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.11Fe'"0.12Al0.09Ti0.90O3
G = -6913.14 (J) H = -5564.51 (J) S = 1.28 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.74 | 6.22 | 73.57 | 5.21 | 4.26 |

Total solids mass = 84.88 (gm) density = 2.71 (gm/cc)
G = -1326671.20 (J) H = -1143934.91 (J) S = 173.51 (J/K) V = 31.31 (cc) Cp = 99.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1569563.40 (J) H = -1344747.88 (J) S = 213.47 (J/K) V = 37.75 (cc) Cp = 120.31 (J/K)

Oxygen delta moles = -0.00158891 delta grams = -0.0508433
G = 371.58 (J) H = -39.02 (J) S = -0.39 (J/K) V = -139.13 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 770.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.14 COH = 1.04
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 13.23 (gm) density = 2.33 (gm/cc) viscosity = 4.41 (log 10 poise) (analysis in wt %)
G = -213345.52 (J) H = -176239.99 (J) S = 35.57 (J/K) V = 5.69 (cc) Cp = 18.15 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.31 0.21 12.17 0.19 0.00 0.55 0.62 0.14 0.00 0.00 2.03 4.24 4.38 0.76 7.40 0.00 0.00 0.00 0.00

garnet mass = 9.04 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -120568.57 (J) H = -102924.70 (J) S = 16.91 (J/K) V = 2.29 (cc) Cp = 9.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.38 | 17.28 | 23.33 |

orthopyroxene mass = 1.92 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -25060.13 (J) H = -21177.53 (J) S = 3.72 (J/K) V = 0.54 (cc) Cp = 2.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.29 | 96.97 | 94.21 | 3.80 | -3.67 | 4.64 | 0.34 |

clinopyroxene mass = 1.20 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.32Mg0.60Fe'"0.04Ti0.04Al0.21Si1.87O6
G = -17441.61 (J) H = -15035.10 (J) S = 2.31 (J/K) V = 0.35 (cc) Cp = 1.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.45 | 8.42 | 31.67 | 8.58 | 0.34 | 3.61 | 8.95 |

biotite mass = 0.56 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -8858.71 (J) H = -7591.07 (J) S = 1.22 (J/K) V = 0.20 (cc) Cp = 0.71 (J/K)

| annite | phlogopite |
|---|---|
| 4.34 | 95.66 |

feldspar mass = 36.17 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -580883.33 (J) H = -501272.65 (J) S = 76.32 (J/K) V = 13.89 (cc) Cp = 44.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.07 | 16.81 | 10.13 |

feldspar mass = 9.61 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -149615.44 (J) H = -128877.09 (J) S = 19.88 (J/K) V = 3.78 (cc) Cp = 11.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.54 | 1.52 | 66.93 |

quartz mass = 27.50 (gm) density = 2.56 (gm/cc)
SiO2
G = -444626.74 (J) H = -387717.26 (J) S = 54.56 (J/K) V = 10.76 (cc) Cp = 31.93 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.11Fe'"0.12Al0.08Ti0.90O3
G = -7027.84 (J) H = -5672.91 (J) S = 1.30 (J/K) V = 0.16 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.57 | 6.13 | 73.91 | 5.29 | 4.10 |

Total solids mass = 86.72 (gm) density = 2.71 (gm/cc)
G = -1354082.36 (J) H = -1170268.30 (J) S = 176.21 (J/K) V = 31.96 (cc) Cp = 101.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1567427.89 (J) H = -1346508.30 (J) S = 211.78 (J/K) V = 37.65 (cc) Cp = 120.06 (J/K)

Oxygen delta moles = -0.00160536 delta grams = -0.0513697
G = 371.49 (J) H = -38.86 (J) S = -0.39 (J/K) V = -139.23 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 11.19 (gm) density = 2.31 (gm/cc) viscosity = 3.97 (log 10 poise) (analysis in wt %)
G = -180643.81 (J) H = -148942.46 (J) S = 30.68 (J/K) V = 4.85 (cc) Cp = 15.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.36 | 0.17 | 11.57 | 0.21 | 0.00 | 0.59 | 0.73 | 0.12 | 0.00 | 0.00 | 2.16 | 4.86 | 3.97 | 0.90 | 8.37 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.70 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.22)3Al2Si3O12
G = -141810.44 (J) H = -121281.89 (J) S = 19.87 (J/K) V = 2.70 (cc) Cp = 11.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.73 | 17.56 | 21.71 |

clinopyroxene mass = 1.34 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.82Fe"0.33Mg0.58Fe'"0.04Ti0.04Al0.21Si1.88O6
G = -19347.39 (J) H = -16704.63 (J) S = 2.56 (J/K) V = 0.39 (cc) Cp = 1.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.98 | 8.14 | 33.33 | 7.99 | 0.72 | 3.45 | 9.39 |

biotite mass = 1.56 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -24601.30 (J) H = -21119.63 (J) S = 3.37 (J/K) V = 0.56 (cc) Cp = 1.96 (J/K)

| annite | phlogopite |
|---|---|
| 5.29 | 94.71 |

feldspar mass = 35.66 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -571954.11 (J) H = -494605.78 (J) S = 74.87 (J/K) V = 13.70 (cc) Cp = 43.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.19 | 15.73 | 10.07 |

feldspar mass = 9.89 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -153840.66 (J) H = -132808.74 (J) S = 20.36 (J/K) V = 3.89 (cc) Cp = 11.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.56 | 1.38 | 67.07 |

quartz mass = 28.86 (gm) density = 2.56 (gm/cc)

SiO2
G = -465970.83 (J)  H = -407162.00 (J)  S = 56.92 (J/K)  V = 11.29 (cc)  Cp = 33.46 (J/K)

rhm-oxide  mass = 0.74 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.75Mg0.10Fe'"0.13Al0.08Ti0.90O3
G = -7146.71 (J)  H = -5780.60 (J)  S = 1.32 (J/K)  V = 0.16 (cc)  Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.73 | 6.26 | 74.83 | 5.33 | 3.86 |

Total solids  mass = 88.75 (gm)  density = 2.71 (gm/cc)
G = -1384671.43 (J)  H = -1199463.27 (J)  S = 179.27 (J/K)  V = 32.69 (cc)  Cp = 104.35 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.66 (gm/cc)
G = -1565315.24 (J)  H = -1348405.72 (J)  S = 209.95 (J/K)  V = 37.54 (cc)  Cp = 119.83 (J/K)

Oxygen  delta moles = -0.00161391  delta grams = -0.0516432
G = 369.51 (J)  H = -38.50 (J)  S = -0.39 (J/K)  V = -138.63 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 750.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.01  delta HM = -5.18  NNO = 0.00  QFM = -0.16  COH = 0.97
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid  mass = 9.64 (gm)  density = 2.29 (gm/cc)  viscosity = 3.48 (log 10 poise)  (analysis in wt %)
G = -155757.58 (J)  H = -128080.42 (J)  S = 27.05 (J/K)  V = 4.21 (cc)  Cp = 13.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.94 | 0.13 | 11.17 | 0.22 | 0.00 | 0.61 | 0.89 | 0.11 | 0.00 | 0.00 | 2.31 | 5.41 | 3.57 | 1.04 | 9.58 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.92 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.61Mg0.20)3Al2Si3O12
G = -144019.46 (J)  H = -123429.96 (J)  S = 20.12 (J/K)  V = 2.75 (cc)  Cp = 11.60 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.50 | 18.11 | 20.39 |

clinopyroxene  mass = 0.50 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.83Fe"0.34Mg0.56Fe'"0.04Ti0.05Al0.21Si1.88O6
G = -7231.90 (J)  H = -6256.32 (J)  S = 0.95 (J/K)  V = 0.15 (cc)  Cp = 0.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.37 | 7.47 | 34.04 | 8.10 | 1.03 | 3.26 | 9.72 |

clinopyroxene  mass = 0.88 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.28Mg0.30Fe'"0.04Ti0.40Al0.72Si1.26O6
G = -12621.70 (J)  H = -10957.60 (J)  S = 1.63 (J/K)  V = 0.25 (cc)  Cp = 0.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.30 | 1.41 | 28.45 | 69.53 | 9.98 | -5.91 | 8.84 |

biotite  mass = 1.87 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)

K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -29218.46 (J) H = -25132.40 (J) S = 3.99 (J/K) V = 0.67 (cc) Cp = 2.34 (J/K)
annite phlogopite
5.99 94.01

feldspar mass = 35.39 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.75Ca0.15Al1.15Si2.85O8
G = -566934.85 (J) H = -491336.43 (J) S = 73.89 (J/K) V = 13.59 (cc) Cp = 43.59 (J/K)
albite anorthite sanidine
74.86 15.40 9.74

feldspar mass = 10.58 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -164226.71 (J) H = -142089.72 (J) S = 21.64 (J/K) V = 4.16 (cc) Cp = 12.54 (J/K)
albite anorthite sanidine
30.96 1.26 67.79

quartz mass = 29.65 (gm) density = 2.56 (gm/cc)
SiO2
G = -478063.59 (J) H = -418581.48 (J) S = 58.14 (J/K) V = 11.59 (cc) Cp = 34.32 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.09Fe'"0.12Al0.07Ti0.90O3
G = -5122.99 (J) H = -4154.18 (J) S = 0.95 (J/K) V = 0.11 (cc) Cp = 0.49 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.15 6.20 75.45 5.49 3.71

Total solids mass = 90.30 (gm) density = 2.71 (gm/cc)
G = -1407439.65 (J) H = -1221938.10 (J) S = 181.30 (J/K) V = 33.27 (cc) Cp = 106.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.67 (gm/cc)
G = -1563197.23 (J) H = -1350018.53 (J) S = 208.36 (J/K) V = 37.49 (cc) Cp = 119.84 (J/K)

Oxygen delta moles = -0.0016644 delta grams = -0.0532587
G = 377.00 (J) H = -39.13 (J) S = -0.41 (J/K) V = -141.59 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 740.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.17 COH = 0.93 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 8.12 (gm) density = 2.26 (gm/cc) viscosity = 2.89 (log 10 poise) (analysis in wt %)
G = -131415.25 (J) H = -107597.64 (J) S = 23.51 (J/K) V = 3.59 (cc) Cp = 11.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.80 | 0.10 | 10.85 | 0.24 | 0.00 | 0.63 | 1.11 | 0.09 | 0.00 | 0.00 | 2.51 | 6.03 | 3.12 | 1.24 | 11.27 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.02 (gm) density = 3.98 (gm/cc) (analysis in mole %)

(Ca0.18Fe"0.62Mg0.19)3Al2Si3O12
G = -144806.31 (J) H = -124363.11 (J) S = 20.18 (J/K) V = 2.77 (cc) Cp = 11.67 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.24 | 18.34 | 19.42 |

clinopyroxene mass = 1.50 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.29Fe'"0.04Ti0.41Al0.74Si1.25O6
G = -21423.07 (J) H = -18639.68 (J) S = 2.75 (J/K) V = 0.42 (cc) Cp = 1.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.10 | 1.27 | 28.90 | 71.15 | 10.03 | -6.17 | 8.91 |

biotite mass = 2.07 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -32315.47 (J) H = -27852.69 (J) S = 4.40 (J/K) V = 0.74 (cc) Cp = 2.59 (J/K)

| annite | phlogopite |
|---|---|
| 6.55 | 93.45 |

feldspar mass = 35.26 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.75Ca0.15Al1.15Si2.85O8
G = -564355.43 (J) H = -490172.22 (J) S = 73.22 (J/K) V = 13.54 (cc) Cp = 43.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.49 | 15.11 | 9.40 |

feldspar mass = 11.24 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -174249.04 (J) H = -151095.57 (J) S = 22.85 (J/K) V = 4.42 (cc) Cp = 13.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.30 | 1.14 | 68.55 |

quartz mass = 30.35 (gm) density = 2.59 (gm/cc)
SiO2
G = -488902.75 (J) H = -429649.15 (J) S = 58.48 (J/K) V = 11.71 (cc) Cp = 40.92 (J/K)

rhm-oxide mass = 0.38 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.76Mg0.09Fe'"0.12Al0.07Ti0.90O3
G = -3627.17 (J) H = -2949.40 (J) S = 0.67 (J/K) V = 0.08 (cc) Cp = 0.34 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.68 | 6.04 | 76.14 | 5.51 | 3.63 |

Total solids mass = 91.83 (gm) density = 2.73 (gm/cc)
G = -1429679.24 (J) H = -1244721.83 (J) S = 182.56 (J/K) V = 33.68 (cc) Cp = 114.28 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.68 (gm/cc)
G = -1561094.49 (J) H = -1352319.47 (J) S = 206.07 (J/K) V = 37.28 (cc) Cp = 125.80 (J/K)

Oxygen delta moles = -0.00170621 delta grams = -0.0545966
G = 382.31 (J) H = -39.51 (J) S = -0.42 (J/K) V = -143.72 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 730.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.18 COH = 0.89

IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 6.40 (gm) density = 2.21 (gm/cc) viscosity = 2.03 (log 10 poise) (analysis in wt %)
G = -104151.30 (J) H = -84533.36 (J) S = 19.56 (J/K) V = 2.89 (cc) Cp = 9.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.77 | 0.07 | 10.67 | 0.26 | 0.00 | 0.66 | 1.43 | 0.08 | 0.00 | 0.00 | 2.85 | 6.90 | 2.53 | 1.57 | 14.23 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.97 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.63Mg0.19)3Al2Si3O12
G = -143640.49 (J) H = -123624.72 (J) S = 19.95 (J/K) V = 2.76 (cc) Cp = 11.59 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.82 | 18.45 | 18.73 |

clinopyroxene mass = 1.54 (gm) density = 3.60 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.28Fe'"0.03Ti0.42Al0.76Si1.23O6
G = -22054.32 (J) H = -19236.17 (J) S = 2.81 (J/K) V = 0.43 (cc) Cp = 1.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -16.34 | 1.14 | 28.93 | 73.98 | 9.83 | -6.33 | 8.79 |

biotite mass = 2.18 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -33920.98 (J) H = -29299.92 (J) S = 4.61 (J/K) V = 0.78 (cc) Cp = 2.72 (J/K)

| annite | phlogopite |
|---|---|
| 6.80 | 93.20 |

feldspar mass = 35.48 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -567229.51 (J) H = -493766.12 (J) S = 73.23 (J/K) V = 13.62 (cc) Cp = 44.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.88 | 15.17 | 8.95 |

feldspar mass = 11.95 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -184903.19 (J) H = -160690.75 (J) S = 24.14 (J/K) V = 4.70 (cc) Cp = 14.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.38 | 1.05 | 69.56 |

quartz mass = 31.06 (gm) density = 2.60 (gm/cc)
SiO2
G = -499704.01 (J) H = -440082.38 (J) S = 59.43 (J/K) V = 11.96 (cc) Cp = 41.51 (J/K)

rhm-oxide mass = 0.36 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.77Mg0.08Fe'"0.11Al0.07Ti0.91O3
G = -3427.40 (J) H = -2795.64 (J) S = 0.63 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.33 | 5.72 | 77.08 | 5.24 | 3.64 |

Total solids mass = 93.55 (gm) density = 2.73 (gm/cc)
G = -1454879.89 (J) H = -1269495.71 (J) S = 184.80 (J/K) V = 34.32 (cc) Cp = 116.59 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1559031.19 (J) H = -1354029.07 (J) S = 204.36 (J/K) V = 37.21 (cc) Cp = 125.91 (J/K)

Oxygen delta moles = -0.00172759 delta grams = -0.0552807
G = 382.88 (J) H = -39.41 (J) S = -0.42 (J/K) V = -144.09 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.26 (log 10 poise)  (analysis in wt %)
G = -1696742.92 (J)  H = -1254416.81 (J)  S = 281.17 (J/K)  V = 40.61 (cc)  Cp = 142.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.26 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1696742.92 (J)  H = -1254416.81 (J)  S = 281.17 (J/K)  V = 40.61 (cc)  Cp = 142.51 (J/K)

Oxygen  delta moles = 3.46945e-16  delta grams = 1.11018e-14
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.32 (log 10 poise)  (analysis in wt %)
G = -1693936.64 (J)  H = -1255842.61 (J)  S = 280.26 (J/K)  V = 40.58 (cc)  Cp = 142.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.32 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1693936.64 (J)  H = -1255842.61 (J)  S = 280.26 (J/K)  V = 40.58 (cc)  Cp = 142.50 (J/K)

Oxygen  delta moles = 1.68848e-06  delta grams = 5.40294e-05
G = -0.61 (J)  H = 0.07 (J)  S = 0.00 (J/K)  V = 0.22 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.38 (log 10 poise)  (analysis in wt %)
G = -1691139.61 (J)  H = -1257268.43 (J)  S = 279.35 (J/K)  V = 40.55 (cc)  Cp = 142.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.38 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1691139.61 (J)  H = -1257268.43 (J)  S = 279.35 (J/K)  V = 40.55 (cc)  Cp = 142.49 (J/K)

Oxygen  delta moles = 3.61807e-06  delta grams = 0.000115774
G = -1.30 (J)  H = 0.15 (J)  S = 0.00 (J/K)  V = 0.47 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.44 (log 10 poise)  (analysis in wt %)
G = -1688351.89 (J)  H = -1258694.26 (J)  S = 278.43 (J/K)  V = 40.53 (cc)  Cp = 142.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.44 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1688351.89 (J)  H = -1258694.26 (J)  S = 278.43 (J/K)  V = 40.53 (cc)  Cp = 142.48 (J/K)

Oxygen  delta moles = 5.79547e-06  delta grams = 0.000185448
G = -2.07 (J)  H = 0.24 (J)  S = 0.00 (J/K)  V = 0.74 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1685573.53 (J)  H = -1260120.13 (J)  S = 277.50 (J/K)  V = 40.50 (cc)  Cp = 142.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1685573.53 (J)  H = -1260120.13 (J)  S = 277.50 (J/K)  V = 40.50 (cc)  Cp = 142.47 (J/K)

Oxygen  delta moles = 8.22766e-06  delta grams = 0.000263275
G = -2.92 (J)  H = 0.34 (J)  S = 0.00 (J/K)  V = 1.05 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.56 (log 10 poise)  (analysis in wt %)
G = -1682804.60 (J)  H = -1261546.03 (J)  S = 276.57 (J/K)  V = 40.47 (cc)  Cp = 142.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1682804.60 (J)  H = -1261546.03 (J)  S = 276.57 (J/K)  V = 40.47 (cc)  Cp = 142.46 (J/K)

Oxygen  delta moles = 1.09219e-05  delta grams = 0.000349489
G = -3.85 (J)  H = 0.45 (J)  S = 0.00 (J/K)  V = 1.38 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1240.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.17  COH = 2.08  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.63 (log 10 poise) (analysis in wt %)
G = -1680045.17 (J) H = -1262971.97 (J) S = 275.63 (J/K) V = 40.44 (cc) Cp = 142.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.63 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1680045.17 (J) H = -1262971.97 (J) S = 275.63 (J/K) V = 40.44 (cc) Cp = 142.45 (J/K)

Oxygen delta moles = 1.38859e-05 delta grams = 0.000444331
G = -4.86 (J) H = 0.57 (J) S = 0.00 (J/K) V = 1.75 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1230.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.16 COH = 2.06 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -1677295.30 (J) H = -1264397.96 (J) S = 274.69 (J/K) V = 40.41 (cc) Cp = 142.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.59 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.69 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1677295.30 (J) H = -1264397.96 (J) S = 274.69 (J/K) V = 40.41 (cc) Cp = 142.44 (J/K)

Oxygen delta moles = 1.71274e-05 delta grams = 0.000548056
G = -5.95 (J) H = 0.70 (J) S = 0.00 (J/K) V = 2.14 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1674555.05 (J) H = -1265823.99 (J) S = 273.74 (J/K) V = 40.38 (cc) Cp = 142.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.60 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1674555.05 (J) H = -1265823.99 (J) S = 273.74 (J/K) V = 40.38 (cc) Cp = 142.44 (J/K)

Oxygen delta moles = 2.06548e-05 delta grams = 0.000660929
G = -7.12 (J) H = 0.83 (J) S = 0.01 (J/K) V = 2.56 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1671824.50 (J) H = -1267250.09 (J) S = 272.78 (J/K) V = 40.35 (cc) Cp = 142.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.60 | 0.00 | 3.06 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1671824.50 (J) H = -1267250.09 (J) S = 272.78 (J/K) V = 40.35 (cc) Cp = 142.43 (J/K)

Oxygen delta moles = 2.44767e-05 delta grams = 0.000783224
G = -8.37 (J) H = 0.98 (J) S = 0.01 (J/K) V = 3.02 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.89 (log 10 poise) (analysis in wt %)
G = -1669103.58 (J) H = -1268622.09 (J) S = 271.85 (J/K) V = 40.32 (cc) Cp = 134.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.60 | 0.00 | 3.05 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.89 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1669103.58 (J) H = -1268622.09 (J) S = 271.85 (J/K) V = 40.32 (cc) Cp = 134.51 (J/K)

Oxygen delta moles = 2.8602e-05 delta grams = 0.00091523
G = -9.71 (J) H = 1.13 (J) S = 0.01 (J/K) V = 3.50 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1666391.98 (J) H = -1269969.09 (J) S = 270.94 (J/K) V = 40.29 (cc) Cp = 134.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.40 | 13.66 | 0.60 | 0.00 | 3.05 | 0.10 | 1.19 | 0.00 | 0.00 | 2.40 | 3.99 | 2.40 | 0.10 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1666391.98 (J) H = -1269969.09 (J) S = 270.94 (J/K) V = 40.29 (cc) Cp = 134.48 (J/K)

Oxygen delta moles = 3.30402e-05 delta grams = 0.00105725
G = -11.13 (J) H = 1.30 (J) S = 0.01 (J/K) V = 4.02 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1180.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.13 COH = 1.97 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1663689.74 (J) H = -1271315.97 (J) S = 270.02 (J/K) V = 40.26 (cc) Cp = 134.45 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.10 0.40 13.66 0.60 0.00 3.05 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1663689.74 (J) H = -1271315.97 (J) S = 270.02 (J/K) V = 40.26 (cc) Cp = 134.45 (J/K)

Oxygen delta moles = 3.78012e-05 delta grams = 0.00120959
G = -12.64 (J) H = 1.47 (J) S = 0.01 (J/K) V = 4.57 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1170.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.12 COH = 1.95 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1660996.93 (J) H = -1272662.72 (J) S = 269.09 (J/K) V = 40.23 (cc) Cp = 134.42 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.10 0.40 13.66 0.60 0.00 3.05 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1660996.93 (J) H = -1272662.72 (J) S = 269.09 (J/K) V = 40.23 (cc) Cp = 134.42 (J/K)

Oxygen delta moles = 4.28951e-05 delta grams = 0.00137259
G = -14.23 (J) H = 1.65 (J) S = 0.01 (J/K) V = 5.15 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1160.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.12 COH = 1.93 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1658313.60 (J) H = -1274009.34 (J) S = 268.15 (J/K) V = 40.20 (cc) Cp = 134.39 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

71.10 0.40 13.66 0.60 0.00 3.05 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1658313.60 (J) H = -1274009.34 (J) S = 268.15 (J/K) V = 40.20 (cc) Cp = 134.39 (J/K)

Oxygen delta moles = 4.83328e-05 delta grams = 0.00154659
G = -15.92 (J) H = 1.84 (J) S = 0.01 (J/K) V = 5.76 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1150.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.11 COH = 1.91 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1655639.84 (J) H = -1275355.82 (J) S = 267.21 (J/K) V = 40.17 (cc) Cp = 134.36 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.10 0.40 13.66 0.61 0.00 3.05 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1655639.84 (J) H = -1275355.82 (J) S = 267.21 (J/K) V = 40.17 (cc) Cp = 134.36 (J/K)

Oxygen delta moles = 5.41254e-05 delta grams = 0.00173195
G = -17.68 (J) H = 2.04 (J) S = 0.01 (J/K) V = 6.40 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1140.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.89 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -1652975.71 (J) H = -1276702.15 (J) S = 266.27 (J/K) V = 40.14 (cc) Cp = 134.32 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.10 0.40 13.66 0.61 0.00 3.05 0.10 1.19 0.00 0.00 2.40 3.99 2.40 0.10 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1652975.71 (J) H = -1276702.15 (J) S = 266.27 (J/K) V = 40.14 (cc) Cp = 134.32 (J/K)

Oxygen delta moles = 6.02848e-05 delta grams = 0.00192904
G = -19.54 (J) H = 2.26 (J) S = 0.02 (J/K) V = 7.08 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1130.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.87 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 99.59 (gm) density = 2.49 (gm/cc) viscosity = 5.40 (log 10 poise) (analysis in wt %)
G = -1644197.11 (J) H = -1273426.81 (J) S = 264.24 (J/K) V = 39.97 (cc) Cp = 133.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.17 | 0.40 | 13.71 | 0.60 | 0.00 | 2.99 | 0.10 | 1.10 | 0.00 | 0.00 | 2.40 | 4.01 | 2.41 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.41 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.59Mg1.31Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -6107.78 (J) H = -4767.82 (J) S = 0.95 (J/K) V = 0.12 (cc) Cp = 0.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.85 | 96.28 | 59.34 | 3.87 | -3.72 | 5.67 | 0.41 |

Total solids mass = 0.41 (gm) density = 3.36 (gm/cc)
G = -6107.78 (J) H = -4767.82 (J) S = 0.95 (J/K) V = 0.12 (cc) Cp = 0.50 (J/K)

Viscosity of the System: 5.41 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1650304.89 (J) H = -1278194.63 (J) S = 265.20 (J/K) V = 40.09 (cc) Cp = 134.16 (J/K)

Oxygen delta moles = 3.57589e-05 delta grams = 0.00114424
G = -11.50 (J) H = 1.33 (J) S = 0.01 (J/K) V = 4.17 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 99.21 (gm) density = 2.49 (gm/cc) viscosity = 5.50 (log 10 poise) (analysis in wt %)
G = -1635999.09 (J) H = -1270566.71 (J) S = 262.31 (J/K) V = 39.82 (cc) Cp = 133.05 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.24 0.40 13.75 0.59 0.00 2.93 0.10 1.02 0.00 0.00 2.41 4.02 2.42 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.79 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.61Mg1.28Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -11645.72 (J) H = -9105.07 (J) S = 1.82 (J/K) V = 0.23 (cc) Cp = 0.95 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-64.00 96.14 61.47 3.99 -3.83 5.82 0.42

Total solids mass = 0.79 (gm) density = 3.37 (gm/cc)
G = -11645.72 (J) H = -9105.07 (J) S = 1.82 (J/K) V = 0.23 (cc) Cp = 0.95 (J/K)

Viscosity of the System: 5.51 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1647644.81 (J) H = -1279671.78 (J) S = 264.13 (J/K) V = 40.05 (cc) Cp = 134.00 (J/K)

Oxygen delta moles = 1.14062e-05 delta grams = 0.000364986
G = -3.64 (J) H = 0.42 (J) S = 0.00 (J/K) V = 1.32 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8a2

T = 1110.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.08 COH = 1.83 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 98.84 (gm) density = 2.49 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -1627981.72 (J) H = -1267821.29 (J) S = 260.39 (J/K) V = 39.66 (cc) Cp = 132.46 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.32 0.41 13.80 0.58 0.00 2.86 0.10 0.94 0.00 0.00 2.42 4.04 2.43 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 1.16 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.64Mg1.26Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -17012.74 (J) H = -13321.99 (J) S = 2.67 (J/K) V = 0.34 (cc) Cp = 1.40 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-66.20 95.99 63.64 4.11 -3.96 5.98 0.44

Total solids mass = 1.16 (gm) density = 3.38 (gm/cc)
G = -17012.74 (J) H = -13321.99 (J) S = 2.67 (J/K) V = 0.34 (cc) Cp = 1.40 (J/K)

Viscosity of the System: 5.61 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1644994.46 (J) H = -1281143.27 (J) S = 263.06 (J/K) V = 40.01 (cc) Cp = 133.85 (J/K)

Oxygen delta moles = -1.47186e-05 delta grams = -0.000470978
G = 4.66 (J) H = -0.53 (J) S = -0.00 (J/K) V = -1.69 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1100.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.07  COH = 1.81  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.48 (gm)  density = 2.49 (gm/cc)  viscosity = 5.70 (log 10 poise)  (analysis in wt %)
G = -1620132.27 (J)  H = -1265181.52 (J)  S = 258.49 (J/K)  V = 39.51 (cc)  Cp = 131.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.39 | 0.41 | 13.84 | 0.57 | 0.00 | 2.79 | 0.10 | 0.87 | 0.00 | 0.00 | 2.42 | 4.05 | 2.43 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.52 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.66Mg1.23Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -22221.58 (J)  H = -17427.94 (J)  S = 3.49 (J/K)  V = 0.45 (cc)  Cp = 1.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.44 | 95.85 | 65.84 | 4.24 | -4.09 | 6.15 | 0.45 |

Total solids  mass = 1.52 (gm)  density = 3.39 (gm/cc)
G = -22221.58 (J)  H = -17427.94 (J)  S = 3.49 (J/K)  V = 0.45 (cc)  Cp = 1.83 (J/K)

Viscosity of the System: 5.72 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1642353.85 (J)  H = -1282609.46 (J)  S = 261.98 (J/K)  V = 39.96 (cc)  Cp = 133.70 (J/K)

Oxygen  delta moles = -4.26925e-05  delta grams = -0.00136611
G = 13.40 (J)  H = -1.54 (J)  S = -0.01 (J/K)  V = -4.87 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1090.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.93  delta HM = -4.91  NNO = 0.00  QFM = 0.07  COH = 1.79  IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.12 (gm)  density = 2.49 (gm/cc)  viscosity = 5.80 (log 10 poise)  (analysis in wt %)
G = -1612439.54 (J)  H = -1262639.40 (J)  S = 256.61 (J/K)  V = 39.37 (cc)  Cp = 131.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.47 | 0.41 | 13.88 | 0.56 | 0.00 | 2.72 | 0.10 | 0.80 | 0.00 | 0.00 | 2.43 | 4.07 | 2.44 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.88 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.68Mg1.21Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -27283.45 (J)  H = -21431.25 (J)  S = 4.29 (J/K)  V = 0.55 (cc)  Cp = 2.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.72 | 95.70 | 68.07 | 4.38 | -4.23 | 6.32 | 0.47 |

Total solids  mass = 1.88 (gm)  density = 3.41 (gm/cc)

G = -27283.45 (J)  H = -21431.25 (J)  S = 4.29 (J/K)  V = 0.55 (cc)  Cp = 2.25 (J/K)

Viscosity of the System: 5.83 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1639722.99 (J)  H = -1284070.65 (J)  S = 260.90 (J/K)  V = 39.92 (cc)  Cp = 133.55 (J/K)

Oxygen  delta moles = -7.25783e-05  delta grams = -0.00232242
G = 22.60 (J)  H = -2.58 (J)  S = -0.02 (J/K)  V = -8.23 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1080.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.06  COH = 1.76  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.12 (gm)  density = 2.49 (gm/cc)  viscosity = 5.88 (log 10 poise)  (analysis in wt %)
G = -1594143.36 (J)  H = -1251528.00 (J)  S = 253.20 (J/K)  V = 38.95 (cc)  Cp = 129.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.36 | 0.41 | 14.01 | 0.55 | 0.00 | 2.66 | 0.10 | 0.74 | 0.00 | 0.00 | 2.45 | 4.11 | 2.47 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.25 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.18Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -32412.82 (J)  H = -25500.84 (J)  S = 5.11 (J/K)  V = 0.66 (cc)  Cp = 2.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.98 | 95.53 | 70.24 | 4.58 | -4.42 | 6.57 | 0.49 |

quartz  mass = 0.63 (gm)  density = 2.56 (gm/cc)
SiO2
G = -10546.60 (J)  H = -8600.18 (J)  S = 1.44 (J/K)  V = 0.25 (cc)  Cp = 0.75 (J/K)

Total solids  mass = 2.88 (gm)  density = 3.18 (gm/cc)
G = -42959.42 (J)  H = -34101.02 (J)  S = 6.55 (J/K)  V = 0.90 (cc)  Cp = 3.44 (J/K)

Viscosity of the System: 5.92 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1637102.79 (J)  H = -1285629.02 (J)  S = 259.74 (J/K)  V = 39.86 (cc)  Cp = 133.39 (J/K)

Oxygen  delta moles = -0.000103306  delta grams = -0.00330565
G = 31.91 (J)  H = -3.64 (J)  S = -0.03 (J/K)  V = -11.62 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1070.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.05  COH = 1.74  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 95.43 (gm) density = 2.49 (gm/cc) viscosity = 5.95 (log 10 poise) (analysis in wt %)
G = -1564400.79 (J) H = -1231205.05 (J) S = 248.07 (J/K) V = 38.26 (cc) Cp = 127.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.19 | 0.42 | 14.16 | 0.55 | 0.00 | 2.61 | 0.11 | 0.68 | 0.00 | 0.00 | 2.47 | 4.15 | 2.51 | 0.11 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.64 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.04Fe"0.73Mg1.15Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -37766.36 (J) H = -29758.88 (J) S = 5.96 (J/K) V = 0.77 (cc) Cp = 3.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.38 | 95.35 | 72.50 | 4.80 | -4.64 | 6.85 | 0.51 |

feldspar mass = 0.33 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.26Al1.26Si2.74O8
G = -5473.04 (J) H = -4417.00 (J) S = 0.79 (J/K) V = 0.13 (cc) Cp = 0.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.69 | 25.70 | 3.61 |

quartz mass = 1.60 (gm) density = 2.56 (gm/cc)
SiO2
G = -26851.93 (J) H = -21945.24 (J) S = 3.65 (J/K) V = 0.63 (cc) Cp = 1.91 (J/K)

Total solids mass = 4.57 (gm) density = 3.00 (gm/cc)
G = -70091.33 (J) H = -56121.13 (J) S = 10.40 (J/K) V = 1.52 (cc) Cp = 5.45 (J/K)

Viscosity of the System: 6.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1634492.12 (J) H = -1287326.18 (J) S = 258.47 (J/K) V = 39.78 (cc) Cp = 133.15 (J/K)

Oxygen delta moles = -0.000138422 delta grams = -0.00442933
G = 42.40 (J) H = -4.83 (J) S = -0.04 (J/K) V = -15.46 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8a2

T = 1060.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.04 COH = 1.72 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 88.05 (gm) density = 2.49 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -1440552.92 (J) H = -1135868.64 (J) S = 228.54 (J/K) V = 35.33 (cc) Cp = 117.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.09 | 0.45 | 14.11 | 0.56 | 0.00 | 2.64 | 0.11 | 0.61 | 0.00 | 0.00 | 2.40 | 4.08 | 2.69 | 0.11 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.29 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.04Fe"0.76Mg1.11Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -46606.19 (J) H = -36753.34 (J) S = 7.39 (J/K) V = 0.96 (cc) Cp = 3.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.63 | 95.45 | 76.44 | 4.89 | -4.72 | 7.06 | 0.50 |

feldspar mass = 4.80 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -80406.78 (J) H = -65037.85 (J) S = 11.53 (J/K) V = 1.84 (cc) Cp = 5.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.83 | 25.24 | 3.93 |

quartz mass = 3.84 (gm) density = 2.56 (gm/cc)
SiO2
G = -64309.93 (J) H = -52675.76 (J) S = 8.73 (J/K) V = 1.50 (cc) Cp = 4.58 (J/K)

Total solids mass = 11.94 (gm) density = 2.78 (gm/cc)
G = -191322.90 (J) H = -154466.96 (J) S = 27.65 (J/K) V = 4.30 (cc) Cp = 14.35 (J/K)

Viscosity of the System: 6.17 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1631875.83 (J) H = -1290335.60 (J) S = 256.19 (J/K) V = 39.63 (cc) Cp = 132.09 (J/K)

Oxygen delta moles = -0.000217673 delta grams = -0.00696526
G = 66.12 (J) H = -7.51 (J) S = -0.06 (J/K) V = -24.13 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1050.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.04 COH = 1.70 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 81.57 (gm) density = 2.49 (gm/cc) viscosity = 5.97 (log 10 poise) (analysis in wt %)
G = -1331992.04 (J) H = -1052287.87 (J) S = 211.39 (J/K) V = 32.76 (cc) Cp = 109.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.00 | 0.49 | 14.06 | 0.56 | 0.00 | 2.65 | 0.12 | 0.55 | 0.00 | 0.00 | 2.33 | 4.01 | 2.86 | 0.12 | 1.23 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.89 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.80Mg1.07Fe"'0.02Ti0.00Al0.13Si1.93O6
G = -54489.82 (J) H = -43008.35 (J) S = 8.68 (J/K) V = 1.12 (cc) Cp = 4.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.72 | 95.56 | 80.21 | 4.99 | -4.81 | 7.27 | 0.50 |

feldspar mass = 8.74 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -146038.65 (J) H = -118390.54 (J) S = 20.90 (J/K) V = 3.35 (cc) Cp = 10.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.94 | 24.81 | 4.25 |

quartz mass = 5.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -96761.41 (J) H = -79432.97 (J) S = 13.10 (J/K) V = 2.26 (cc) Cp = 6.89 (J/K)

Total solids mass = 18.42 (gm) density = 2.73 (gm/cc)

G = -297289.89 (J)  H = -240831.87 (J)  S = 42.67 (J/K)  V = 6.74 (cc)  Cp = 22.15 (J/K)

Viscosity of the System: 6.33 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.53 (gm/cc)
G = -1629281.93 (J)  H = -1293119.74 (J)  S = 254.06 (J/K)  V = 39.49 (cc)  Cp = 131.15 (J/K)

Oxygen  delta moles = -0.000296356  delta grams = -0.00948302
G = 89.27 (J)  H = -10.12 (J)  S = -0.08 (J/K)  V = -32.60 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1040.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.03  COH = 1.67  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 75.83 (gm)  density = 2.49 (gm/cc)  viscosity = 5.98 (log 10 poise)  (analysis in wt %)
G = -1236045.76 (J)  H = -978402.16 (J)  S = 196.20 (J/K)  V = 30.48 (cc)  Cp = 101.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.92 | 0.53 | 14.02 | 0.57 | 0.00 | 2.64 | 0.13 | 0.50 | 0.00 | 0.00 | 2.28 | 3.93 | 3.03 | 0.13 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.44 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.84Mg1.04Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -61576.33 (J)  H = -48650.17 (J)  S = 9.84 (J/K)  V = 1.28 (cc)  Cp = 5.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.61 | 95.67 | 83.79 | 5.09 | -4.90 | 7.47 | 0.49 |

feldspar  mass = 12.22 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -203965.80 (J)  H = -165723.98 (J)  S = 29.12 (J/K)  V = 4.69 (cc)  Cp = 15.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.00 | 24.42 | 4.58 |

quartz  mass = 7.49 (gm)  density = 2.56 (gm/cc)
SiO2
G = -125121.28 (J)  H = -102942.21 (J)  S = 16.89 (J/K)  V = 2.93 (cc)  Cp = 8.92 (J/K)

Total solids  mass = 24.16 (gm)  density = 2.72 (gm/cc)
G = -390663.41 (J)  H = -317316.36 (J)  S = 55.86 (J/K)  V = 8.90 (cc)  Cp = 29.17 (J/K)

Viscosity of the System: 6.50 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.54 (gm/cc)
G = -1626709.17 (J)  H = -1295718.51 (J)  S = 252.06 (J/K)  V = 39.37 (cc)  Cp = 130.44 (J/K)

Oxygen  delta moles = -0.00037421  delta grams = -0.0119743
G = 111.78 (J)  H = -12.65 (J)  S = -0.09 (J/K)  V = -40.86 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f8a2

T = 1030.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.02  COH = 1.65  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 70.70 (gm)  density = 2.49 (gm/cc)  viscosity = 5.99 (log 10 poise)  (analysis in wt %)
G = -1150648.54 (J)  H = -912618.70 (J)  S = 182.66 (J/K)  V = 28.44 (cc)  Cp = 94.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.84 | 0.57 | 13.98 | 0.56 | 0.00 | 2.61 | 0.14 | 0.45 | 0.00 | 0.00 | 2.23 | 3.85 | 3.20 | 0.14 | 1.42 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.95 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.87Mg1.00Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -67978.08 (J)  H = -53768.31 (J)  S = 10.90 (J/K)  V = 1.42 (cc)  Cp = 5.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.27 | 95.79 | 87.15 | 5.18 | -4.98 | 7.65 | 0.48 |

feldspar  mass = 15.33 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -255432.49 (J)  H = -208010.05 (J)  S = 36.39 (J/K)  V = 5.89 (cc)  Cp = 18.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.03 | 24.07 | 4.90 |

quartz  mass = 9.00 (gm)  density = 2.56 (gm/cc)
SiO2
G = -150097.52 (J)  H = -123764.85 (J)  S = 20.21 (J/K)  V = 3.52 (cc)  Cp = 10.71 (J/K)

Total solids  mass = 29.29 (gm)  density = 2.71 (gm/cc)
G = -473508.09 (J)  H = -385543.20 (J)  S = 67.50 (J/K)  V = 10.82 (cc)  Cp = 35.34 (J/K)

Viscosity of the System: 6.68 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.55 (gm/cc)
G = -1624156.63 (J)  H = -1298161.90 (J)  S = 250.16 (J/K)  V = 39.26 (cc)  Cp = 129.71 (J/K)

Oxygen  delta moles = -0.000450866  delta grams = -0.0144272
G = 133.54 (J)  H = -15.08 (J)  S = -0.11 (J/K)  V = -48.85 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 1020.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.01  COH = 1.63  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 66.09 (gm)  density = 2.48 (gm/cc)  viscosity = 6.00 (log 10 poise)  (analysis in wt %)
G = -1074197.95 (J)  H = -853702.47 (J)  S = 170.51 (J/K)  V = 26.62 (cc)  Cp = 88.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.77 | 0.60 | 13.95 | 0.56 | 0.00 | 2.56 | 0.15 | 0.41 | 0.00 | 0.00 | 2.19 | 3.77 | 3.37 | 0.15 | 1.52 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.43 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg0.97Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -73774.56 (J) H = -58426.24 (J) S = 11.87 (J/K) V = 1.55 (cc) Cp = 6.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.67 | 95.89 | 90.27 | 5.26 | -5.05 | 7.82 | 0.47 |

feldspar mass = 18.12 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -301408.10 (J) H = -246004.66 (J) S = 42.84 (J/K) V = 6.96 (cc) Cp = 22.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.02 | 23.74 | 5.23 |

quartz mass = 10.34 (gm) density = 2.56 (gm/cc)
SiO2
G = -172242.96 (J) H = -142339.23 (J) S = 23.12 (J/K) V = 4.04 (cc) Cp = 12.30 (J/K)

Total solids mass = 33.89 (gm) density = 2.70 (gm/cc)
G = -547425.63 (J) H = -446770.13 (J) S = 77.84 (J/K) V = 12.54 (cc) Cp = 40.85 (J/K)

Viscosity of the System: 6.89 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1621623.57 (J) H = -1300472.60 (J) S = 248.35 (J/K) V = 39.16 (cc) Cp = 129.04 (J/K)

Oxygen delta moles = -0.000525893 delta grams = -0.0168279
G = 154.43 (J) H = -17.40 (J) S = -0.13 (J/K) V = -56.54 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 1010.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.00 COH = 1.60 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 61.94 (gm) density = 2.48 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -1005414.82 (J) H = -800667.94 (J) S = 159.57 (J/K) V = 24.97 (cc) Cp = 82.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.70 | 0.64 | 13.92 | 0.55 | 0.00 | 2.49 | 0.16 | 0.37 | 0.00 | 0.00 | 2.15 | 3.69 | 3.54 | 0.16 | 1.62 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.86 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.93Mg0.94Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -79024.20 (J) H = -62670.55 (J) S = 12.74 (J/K) V = 1.66 (cc) Cp = 6.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.79 | 95.99 | 93.14 | 5.34 | -5.12 | 7.97 | 0.46 |

feldspar mass = 20.64 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -342671.42 (J) H = -280315.03 (J) S = 48.60 (J/K) V = 7.92 (cc) Cp = 25.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.99 | 23.44 | 5.57 |

quartz mass = 11.54 (gm) density = 2.56 (gm/cc)
SiO2
G = -191998.97 (J) H = -159015.38 (J) S = 25.71 (J/K) V = 4.51 (cc) Cp = 13.71 (J/K)

Total solids mass = 38.04 (gm) density = 2.70 (gm/cc)
G = -613694.59 (J) H = -502000.95 (J) S = 87.05 (J/K) V = 14.09 (cc) Cp = 45.81 (J/K)

Viscosity of the System: 7.12 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1619109.40 (J) H = -1302668.89 (J) S = 246.61 (J/K) V = 39.07 (cc) Cp = 128.43 (J/K)

Oxygen delta moles = -0.000598861 delta grams = -0.0191628
G = 174.34 (J) H = -19.60 (J) S = -0.15 (J/K) V = -63.89 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 1000.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = -0.00 COH = 1.58 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 58.18 (gm) density = 2.48 (gm/cc) viscosity = 6.02 (log 10 poise) (analysis in wt %)
G = -943258.62 (J) H = -752713.76 (J) S = 149.66 (J/K) V = 23.48 (cc) Cp = 77.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.63 | 0.69 | 13.89 | 0.54 | 0.00 | 2.41 | 0.17 | 0.34 | 0.00 | 0.00 | 2.11 | 3.61 | 3.71 | 0.17 | 1.72 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.26 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.92Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -83772.40 (J) H = -66537.12 (J) S = 13.54 (J/K) V = 1.77 (cc) Cp = 7.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.63 | 96.08 | 95.75 | 5.41 | -5.18 | 8.10 | 0.46 |

feldspar mass = 22.91 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -379859.67 (J) H = -311437.86 (J) S = 53.74 (J/K) V = 8.79 (cc) Cp = 28.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.94 | 23.17 | 5.90 |

quartz mass = 12.63 (gm) density = 2.56 (gm/cc)
SiO2
G = -209722.94 (J) H = -174076.85 (J) S = 28.00 (J/K) V = 4.93 (cc) Cp = 14.99 (J/K)

Total solids mass = 41.80 (gm) density = 2.70 (gm/cc)
G = -673355.01 (J) H = -552051.83 (J) S = 95.28 (J/K) V = 15.50 (cc) Cp = 50.28 (J/K)

Viscosity of the System: 7.40 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1616613.63 (J) H = -1304765.59 (J) S = 244.94 (J/K) V = 38.98 (cc) Cp = 127.86 (J/K)

Oxygen delta moles = -0.000669389 delta grams = -0.0214196
G = 193.18 (J) H = -21.66 (J) S = -0.17 (J/K) V = -70.86 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8a2

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 54.76 (gm) density = 2.47 (gm/cc) viscosity = 6.03 (log 10 poise) (analysis in wt %)
G = -886868.67 (J) H = -709177.45 (J) S = 140.67 (J/K) V = 22.13 (cc) Cp = 73.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.56 | 0.73 | 13.87 | 0.52 | 0.00 | 2.32 | 0.18 | 0.31 | 0.00 | 0.00 | 2.08 | 3.53 | 3.88 | 0.18 | 1.83 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.63 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.89Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -88057.03 (J) H = -70055.51 (J) S = 14.25 (J/K) V = 1.87 (cc) Cp = 7.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.19 | 96.17 | 98.12 | 5.48 | -5.22 | 8.20 | 0.45 |

feldspar mass = 24.98 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -413502.39 (J) H = -339785.93 (J) S = 58.36 (J/K) V = 9.59 (cc) Cp = 30.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.86 | 22.91 | 6.23 |

quartz mass = 13.61 (gm) density = 2.56 (gm/cc)
SiO2
G = -225707.72 (J) H = -187756.11 (J) S = 30.05 (J/K) V = 5.31 (cc) Cp = 16.14 (J/K)

Total solids mass = 45.22 (gm) density = 2.70 (gm/cc)
G = -727267.13 (J) H = -597597.55 (J) S = 102.66 (J/K) V = 16.77 (cc) Cp = 54.33 (J/K)

Viscosity of the System: 7.75 (log 10 poise)

System mass = 99.98 (gm) density = 2.57 (gm/cc)
G = -1614135.80 (J) H = -1306775.00 (J) S = 243.33 (J/K) V = 38.90 (cc) Cp = 127.34 (J/K)

Oxygen delta moles = -0.000737163 delta grams = -0.0235883
G = 210.89 (J) H = -23.59 (J) S = -0.19 (J/K) V = -77.42 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 980.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = -0.02 COH = 1.53 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 51.64 (gm) density = 2.47 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -835522.45 (J) H = -669503.18 (J) S = 132.48 (J/K) V = 20.90 (cc) Cp = 68.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.49 | 0.77 | 13.85 | 0.51 | 0.00 | 2.22 | 0.19 | 0.29 | 0.00 | 0.00 | 2.06 | 3.45 | 4.04 | 0.19 | 1.94 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.97 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.87Fe"'0.03Ti0.00Al0.14Si1.91O6
G = -91911.98 (J) H = -73251.74 (J) S = 14.89 (J/K) V = 1.96 (cc) Cp = 7.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.48 | 96.24 | 100.26 | 5.53 | -5.27 | 8.28 | 0.44 |

feldspar mass = 26.87 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.23Al1.23Si2.77O8
G = -444045.40 (J) H = -365706.91 (J) S = 62.51 (J/K) V = 10.31 (cc) Cp = 32.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.76 | 22.67 | 6.57 |

quartz mass = 14.50 (gm) density = 2.56 (gm/cc)
SiO2
G = -240195.67 (J) H = -200245.67 (J) S = 31.88 (J/K) V = 5.66 (cc) Cp = 17.18 (J/K)

Total solids mass = 48.34 (gm) density = 2.70 (gm/cc)
G = -776153.05 (J) H = -639204.32 (J) S = 109.28 (J/K) V = 17.93 (cc) Cp = 58.02 (J/K)

Viscosity of the System: 8.27 (log 10 poise)

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1611675.51 (J) H = -1308707.49 (J) S = 241.77 (J/K) V = 38.83 (cc) Cp = 126.86 (J/K)

Oxygen delta moles = -0.000801953 delta grams = -0.0256615
G = 227.40 (J) H = -25.38 (J) S = -0.20 (J/K) V = -83.56 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 970.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = -0.03 COH = 1.50 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 48.78 (gm) density = 2.47 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -788606.07 (J) H = -633218.91 (J) S = 124.99 (J/K) V = 19.77 (cc) Cp = 65.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.41 | 0.82 | 13.83 | 0.49 | 0.00 | 2.12 | 0.21 | 0.26 | 0.00 | 0.00 | 2.03 | 3.37 | 4.20 | 0.21 | 2.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.27 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.85Fe"'0.03Ti0.00Al0.14Si1.91O6
G = -95369.19 (J) H = -76149.98 (J) S = 15.46 (J/K) V = 2.04 (cc) Cp = 8.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.53 | 96.31 | 102.18 | 5.58 | -5.30 | 8.33 | 0.43 |

feldspar mass = 28.60 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -471868.07 (J) H = -389496.79 (J) S = 66.26 (J/K) V = 10.97 (cc) Cp = 34.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.64 | 22.45 | 6.90 |

quartz mass = 15.32 (gm) density = 2.56 (gm/cc)
SiO2
G = -253389.03 (J) H = -211706.25 (J) S = 33.53 (J/K) V = 5.98 (cc) Cp = 18.14 (J/K)

Total solids mass = 51.19 (gm) density = 2.69 (gm/cc)
G = -820626.29 (J) H = -677353.02 (J) S = 115.25 (J/K) V = 19.00 (cc) Cp = 61.37 (J/K)

Viscosity of the System: 9.45 (log 10 poise)

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1609232.36 (J) H = -1310571.93 (J) S = 240.24 (J/K) V = 38.76 (cc) Cp = 126.40 (J/K)

Oxygen delta moles = -0.000863608 delta grams = -0.0276344
G = 242.72 (J) H = -27.02 (J) S = -0.22 (J/K) V = -89.26 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 960.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = -0.04 COH = 1.47 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 46.16 (gm) density = 2.47 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -745592.87 (J) H = -599919.88 (J) S = 118.13 (J/K) V = 18.73 (cc) Cp = 61.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.33 | 0.86 | 13.82 | 0.47 | 0.00 | 2.01 | 0.22 | 0.24 | 0.00 | 0.00 | 2.01 | 3.29 | 4.36 | 0.22 | 2.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.55 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.84Fe"'0.03Ti0.00Al0.14Si1.91O6
G = -98459.56 (J) H = -78773.33 (J) S = 15.96 (J/K) V = 2.11 (cc) Cp = 8.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.35 | 96.37 | 103.89 | 5.62 | -5.32 | 8.36 | 0.43 |

feldspar mass = 30.19 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -497295.88 (J) H = -411409.76 (J) S = 69.65 (J/K) V = 11.58 (cc) Cp = 36.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.51 | 22.25 | 7.24 |

quartz mass = 16.07 (gm) density = 2.56 (gm/cc)
SiO2
G = -265457.68 (J) H = -222273.03 (J) S = 35.02 (J/K) V = 6.27 (cc) Cp = 19.01 (J/K)

Total solids mass = 53.81 (gm) density = 2.69 (gm/cc)

G = -861213.12 (J)  H = -712456.12 (J)  S = 120.63 (J/K)  V = 19.97 (cc)  Cp = 64.44 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.58 (gm/cc)
G = -1606805.99 (J)  H = -1312375.99 (J)  S = 238.76 (J/K)  V = 38.70 (cc)  Cp = 125.98 (J/K)

Oxygen  delta moles = -0.000922053  delta grams = -0.0295046
G = 256.83 (J)  H = -28.52 (J)  S = -0.23 (J/K)  V = -94.54 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 950.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = -0.05  COH = 1.45
IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 43.75 (gm)  density = 2.46 (gm/cc)  viscosity = 6.05 (log 10 poise)  (analysis in wt %)
G = -706027.78 (J)  H = -569256.44 (J)  S = 111.82 (J/K)  V = 17.77 (cc)  Cp = 58.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.24 | 0.91 | 13.81 | 0.45 | 0.00 | 1.91 | 0.23 | 0.22 | 0.00 | 0.00 | 1.99 | 3.21 | 4.51 | 0.23 | 2.29 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 7.80 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.82Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -101213.20 (J)  H = -81144.19 (J)  S = 16.41 (J/K)  V = 2.18 (cc)  Cp = 8.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.95 | 96.42 | 105.42 | 5.66 | -5.34 | 8.38 | 0.42 |

feldspar  mass = 31.65 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -520609.85 (J)  H = -431665.48 (J)  S = 72.72 (J/K)  V = 12.14 (cc)  Cp = 38.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.36 | 22.06 | 7.58 |

quartz  mass = 16.76 (gm)  density = 2.56 (gm/cc)
SiO2
G = -276545.22 (J)  H = -232060.28 (J)  S = 36.37 (J/K)  V = 6.55 (cc)  Cp = 19.81 (J/K)

Total solids  mass = 56.22 (gm)  density = 2.69 (gm/cc)
G = -898368.27 (J)  H = -744869.95 (J)  S = 125.49 (J/K)  V = 20.87 (cc)  Cp = 67.26 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.59 (gm/cc)
G = -1604396.04 (J)  H = -1314126.39 (J)  S = 237.31 (J/K)  V = 38.64 (cc)  Cp = 125.58 (J/K)

Oxygen  delta moles = -0.000977276  delta grams = -0.0312717
G = 269.76 (J)  H = -29.88 (J)  S = -0.24 (J/K)  V = -99.39 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8a2

T = 940.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = -0.06  COH = 1.42
IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 41.52 (gm)  density = 2.46 (gm/cc)  viscosity = 6.05 (log 10 poise)  (analysis in wt %)
G = -669515.46 (J)  H = -540924.89 (J)  S = 106.00 (J/K)  V = 16.89 (cc)  Cp = 55.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.14 | 0.96 | 13.80 | 0.43 | 0.00 | 1.80 | 0.24 | 0.21 | 0.00 | 0.00 | 1.98 | 3.13 | 4.66 | 0.24 | 2.42 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.03 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.07Mg0.81Fe"'0.03Ti0.00Al0.14Si1.91O6
G = -103659.37 (J)  H = -83284.19 (J)  S = 16.80 (J/K)  V = 2.24 (cc)  Cp = 9.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.38 | 96.47 | 106.79 | 5.69 | -5.36 | 8.37 | 0.41 |

feldspar  mass = 33.01 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -542053.75 (J)  H = -450454.76 (J)  S = 75.51 (J/K)  V = 12.66 (cc)  Cp = 40.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.20 | 21.88 | 7.92 |

quartz  mass = 17.40 (gm)  density = 2.56 (gm/cc)
SiO2
G = -286773.60 (J)  H = -241165.17 (J)  S = 37.60 (J/K)  V = 6.80 (cc)  Cp = 20.56 (J/K)

Total solids  mass = 58.44 (gm)  density = 2.69 (gm/cc)
G = -932486.72 (J)  H = -774904.11 (J)  S = 129.90 (J/K)  V = 21.70 (cc)  Cp = 69.84 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.59 (gm/cc)
G = -1602002.19 (J)  H = -1315829.00 (J)  S = 235.89 (J/K)  V = 38.59 (cc)  Cp = 125.20 (J/K)

Oxygen  delta moles = -0.00102932  delta grams = -0.0329369
G = 281.54 (J)  H = -31.10 (J)  S = -0.26 (J/K)  V = -103.82 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 930.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.36  delta HM = -5.02  NNO = 0.00  QFM = -0.07  COH = 1.39
IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid  mass = 39.18 (gm)  density = 2.45 (gm/cc)  viscosity = 6.05 (log 10 poise)  (analysis in wt %)
G = -631467.86 (J)  H = -511231.28 (J)  S = 99.93 (J/K)  V = 15.97 (cc)  Cp = 52.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.13 | 0.88 | 13.81 | 0.40 | 0.00 | 1.67 | 0.25 | 0.19 | 0.00 | 0.00 | 1.96 | 3.06 | 4.83 | 0.26 | 2.56 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.16 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.80Fe'''0.03Ti0.00Al0.14Si1.91O6
G = -104968.15 (J) H = -84540.99 (J) S = 16.98 (J/K) V = 2.27 (cc) Cp = 9.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.07 | 96.49 | 107.56 | 5.68 | -5.37 | 8.31 | 0.41 |

feldspar mass = 34.40 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -563938.70 (J) H = -469690.04 (J) S = 78.33 (J/K) V = 13.19 (cc) Cp = 41.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.91 | 21.74 | 8.35 |

quartz mass = 18.11 (gm) density = 2.56 (gm/cc)
SiO2
G = -298096.52 (J) H = -251229.49 (J) S = 38.95 (J/K) V = 7.07 (cc) Cp = 21.38 (J/K)

rhm-oxide mass = 0.12 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'''0.19Al0.13Ti0.84O3
G = -1165.14 (J) H = -891.73 (J) S = 0.23 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.99 | 9.33 | 71.94 | 3.43 | 6.31 |

Total solids mass = 60.79 (gm) density = 2.69 (gm/cc)
G = -968168.51 (J) H = -806352.25 (J) S = 134.49 (J/K) V = 22.57 (cc) Cp = 72.55 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1599636.37 (J) H = -1317583.53 (J) S = 234.43 (J/K) V = 38.53 (cc) Cp = 124.80 (J/K)

Oxygen delta moles = -0.00105609 delta grams = -0.0337937
G = 286.22 (J) H = -31.54 (J) S = -0.26 (J/K) V = -105.64 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 920.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = -0.08 COH = 1.36 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 37.07 (gm) density = 2.45 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -597242.77 (J) H = -484499.50 (J) S = 94.49 (J/K) V = 15.14 (cc) Cp = 49.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.09 | 0.83 | 13.82 | 0.38 | 0.00 | 1.56 | 0.26 | 0.18 | 0.00 | 0.00 | 1.94 | 2.99 | 4.98 | 0.27 | 2.71 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.29 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.79Fe'''0.03Ti0.00Al0.14Si1.91O6
G = -106260.22 (J) H = -85789.56 (J) S = 17.16 (J/K) V = 2.31 (cc) Cp = 9.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.79 | 96.51 | 108.33 | 5.67 | -5.38 | 8.25 | 0.40 |

feldspar mass = 35.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.22Al1.22Si2.78O8
G = -583687.00 (J) H = -487223.83 (J) S = 80.85 (J/K) V = 13.68 (cc) Cp = 43.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.63 | 21.59 | 8.78 |

quartz mass = 18.75 (gm) density = 2.56 (gm/cc)
SiO2
G = -308145.05 (J) H = -260258.39 (J) S = 40.13 (J/K) V = 7.32 (cc) Cp = 22.11 (J/K)

rhm-oxide mass = 0.20 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.09Fe'"0.18Al0.12Ti0.85O3
G = -1947.70 (J) H = -1495.26 (J) S = 0.38 (J/K) V = 0.04 (cc) Cp = 0.19 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.84 | 9.20 | 72.22 | 3.57 | 6.18 |

Total solids mass = 62.89 (gm) density = 2.69 (gm/cc)
G = -1000039.97 (J) H = -834767.04 (J) S = 138.52 (J/K) V = 23.35 (cc) Cp = 74.98 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.60 (gm/cc)
G = -1597282.73 (J) H = -1319266.54 (J) S = 233.01 (J/K) V = 38.48 (cc) Cp = 124.42 (J/K)

Oxygen delta moles = -0.00108691 delta grams = -0.0347797
G = 291.86 (J) H = -32.07 (J) S = -0.27 (J/K) V = -107.82 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 910.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = -0.09 COH = 1.34 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 35.11 (gm) density = 2.44 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -565292.95 (J) H = -459483.97 (J) S = 89.43 (J/K) V = 14.36 (cc) Cp = 46.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.78 | 13.79 | 0.36 | 0.00 | 1.44 | 0.27 | 0.17 | 0.00 | 0.00 | 1.93 | 2.94 | 5.12 | 0.29 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.25 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.62Mg0.23)3Al2Si3O12
G = -3425.21 (J) H = -2822.89 (J) S = 0.51 (J/K) V = 0.06 (cc) Cp = 0.28 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.89 | 15.31 | 22.80 |

orthopyroxene mass = 8.23 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.09Mg0.79Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -105288.49 (J) H = -85230.73 (J) S = 16.95 (J/K) V = 2.29 (cc) Cp = 9.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.86 | 96.51 | 108.58 | 5.61 | -5.33 | 8.10 | 0.40 |

feldspar mass = 36.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.21Al1.21Si2.79O8
G = -600220.99 (J) H = -502134.47 (J) S = 82.90 (J/K) V = 14.09 (cc) Cp = 44.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.41 | 21.34 | 9.25 |

quartz mass = 19.38 (gm) density = 2.56 (gm/cc)
SiO2
G = -318079.73 (J) H = -269227.14 (J) S = 41.29 (J/K) V = 7.57 (cc) Cp = 22.83 (J/K)

rhm-oxide mass = 0.27 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.09Fe'"0.18Al0.12Ti0.85O3
G = -2630.88 (J) H = -2026.20 (J) S = 0.51 (J/K) V = 0.06 (cc) Cp = 0.25 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.77 | 9.03 | 72.46 | 3.71 | 6.02 |

Total solids mass = 64.86 (gm) density = 2.70 (gm/cc)
G = -1029645.30 (J) H = -861441.43 (J) S = 142.17 (J/K) V = 24.07 (cc) Cp = 77.22 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1594938.25 (J) H = -1320925.40 (J) S = 231.60 (J/K) V = 38.43 (cc) Cp = 124.06 (J/K)

Oxygen delta moles = -0.00112703 delta grams = -0.0360636
G = 299.82 (J) H = -32.85 (J) S = -0.28 (J/K) V = -110.87 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 900.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.10 COH = 1.31 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 33.23 (gm) density = 2.44 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -534779.22 (J) H = -435486.94 (J) S = 84.64 (J/K) V = 13.63 (cc) Cp = 44.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.10 | 0.74 | 13.62 | 0.33 | 0.00 | 1.30 | 0.28 | 0.17 | 0.00 | 0.00 | 1.93 | 2.95 | 5.25 | 0.30 | 3.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.39 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.61Mg0.23)3Al2Si3O12
G = -18679.50 (J) H = -15436.84 (J) S = 2.76 (J/K) V = 0.35 (cc) Cp = 1.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.39 | 15.80 | 22.80 |

orthopyroxene mass = 7.57 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.07Mg0.81Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -97033.38 (J) H = -78813.55 (J) S = 15.53 (J/K) V = 2.11 (cc) Cp = 8.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.81 | 96.40 | 107.13 | 5.35 | -5.09 | 7.62 | 0.40 |

feldspar mass = 37.35 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -609355.39 (J) H = -510873.34 (J) S = 83.95 (J/K) V = 14.33 (cc) Cp = 45.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.40 | 20.68 | 9.92 |

quartz mass = 20.10 (gm) density = 2.56 (gm/cc)
SiO2
G = -329527.82 (J) H = -279515.36 (J) S = 42.63 (J/K) V = 7.85 (cc) Cp = 23.66 (J/K)

rhm-oxide mass = 0.33 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'''0.17Al0.12Ti0.85O3
G = -3215.62 (J) H = -2485.32 (J) S = 0.62 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.98 | 8.71 | 72.60 | 3.92 | 5.79 |

Total solids mass = 66.73 (gm) density = 2.70 (gm/cc)
G = -1057811.71 (J) H = -887124.41 (J) S = 145.49 (J/K) V = 24.71 (cc) Cp = 79.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1592590.93 (J) H = -1322611.35 (J) S = 230.13 (J/K) V = 38.34 (cc) Cp = 123.65 (J/K)

Oxygen delta moles = -0.00119981 delta grams = -0.0383926
G = 316.19 (J) H = -34.55 (J) S = -0.30 (J/K) V = -117.03 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 31.45 (gm) density = 2.43 (gm/cc) viscosity = 5.97 (log 10 poise) (analysis in wt %)
G = -505995.75 (J) H = -412791.39 (J) S = 80.13 (J/K) V = 12.93 (cc) Cp = 41.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.13 | 0.70 | 13.46 | 0.30 | 0.00 | 1.17 | 0.29 | 0.16 | 0.00 | 0.00 | 1.92 | 2.97 | 5.36 | 0.32 | 3.19 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.43 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.61Mg0.23)3Al2Si3O12
G = -32779.42 (J) H = -27163.37 (J) S = 4.83 (J/K) V = 0.62 (cc) Cp = 2.63 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.86 | 16.31 | 22.82 |

orthopyroxene mass = 6.96 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.83Fe'''0.02Ti0.00Al0.13Si1.93O6
G = -89432.82 (J) H = -72887.44 (J) S = 14.22 (J/K) V = 1.94 (cc) Cp = 7.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.64 | 96.28 | 105.55 | 5.10 | -4.85 | 7.15 | 0.41 |

feldspar mass = 37.96 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.69Ca0.20Al1.20Si2.80O8
G = -618055.49 (J) H = -519280.42 (J) S = 84.92 (J/K) V = 14.57 (cc) Cp = 46.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.35 | 20.03 | 10.63 |

quartz mass = 20.78 (gm) density = 2.56 (gm/cc)
SiO2
G = -340262.97 (J) H = -289238.73 (J) S = 43.87 (J/K) V = 8.12 (cc) Cp = 24.44 (J/K)

rhm-oxide mass = 0.38 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe'"0.17Al0.11Ti0.86O3
G = -3736.01 (J) H = -2897.78 (J) S = 0.72 (J/K) V = 0.08 (cc) Cp = 0.36 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.20 | 8.39 | 72.71 | 4.13 | 5.57 |

Total solids mass = 68.51 (gm) density = 2.71 (gm/cc)
G = -1084266.72 (J) H = -911467.74 (J) S = 148.56 (J/K) V = 25.32 (cc) Cp = 81.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1590262.47 (J) H = -1324259.12 (J) S = 228.69 (J/K) V = 38.25 (cc) Cp = 123.27 (J/K)

Oxygen delta moles = -0.00126452 delta grams = -0.0404631
G = 330.09 (J) H = -35.96 (J) S = -0.31 (J/K) V = -122.29 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8a2

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 29.77 (gm) density = 2.43 (gm/cc) viscosity = 5.93 (log 10 poise) (analysis in wt %)
G = -478641.13 (J) H = -391158.91 (J) S = 75.86 (J/K) V = 12.26 (cc) Cp = 39.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.13 | 0.66 | 13.31 | 0.28 | 0.00 | 1.06 | 0.31 | 0.16 | 0.00 | 0.00 | 1.92 | 3.00 | 5.46 | 0.34 | 3.37 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.40 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.60Mg0.23)3Al2Si3O12
G = -45904.96 (J) H = -38144.68 (J) S = 6.73 (J/K) V = 0.86 (cc) Cp = 3.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.29 | 16.85 | 22.87 |

orthopyroxene mass = 6.39 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.85Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -82394.94 (J) H = -67381.83 (J) S = 13.02 (J/K) V = 1.79 (cc) Cp = 7.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.34 | 96.16 | 103.83 | 4.85 | -4.61 | 6.70 | 0.41 |

feldspar mass = 38.54 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.69Ca0.19Al1.19Si2.81O8
G = -626408.95 (J) H = -527426.96 (J) S = 85.84 (J/K) V = 14.80 (cc) Cp = 46.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.26 | 19.37 | 11.37 |

quartz mass = 21.43 (gm) density = 2.56 (gm/cc)
SiO2
G = -350400.48 (J) H = -298491.51 (J) S = 45.01 (J/K) V = 8.37 (cc) Cp = 25.18 (J/K)

rhm-oxide mass = 0.43 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.09Fe"'0.16Al0.11Ti0.87O3
G = -4201.69 (J) H = -3270.59 (J) S = 0.81 (J/K) V = 0.09 (cc) Cp = 0.40 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.44 | 8.08 | 72.78 | 4.33 | 5.37 |

Total solids mass = 70.19 (gm) density = 2.71 (gm/cc)
G = -1109311.01 (J) H = -934715.56 (J) S = 151.41 (J/K) V = 25.91 (cc) Cp = 83.16 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1587952.15 (J) H = -1325874.47 (J) S = 227.27 (J/K) V = 38.17 (cc) Cp = 122.91 (J/K)

Oxygen delta moles = -0.00132207 delta grams = -0.0423047
G = 341.83 (J) H = -37.13 (J) S = -0.33 (J/K) V = -126.76 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 870.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.13 COH = 1.22 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 28.15 (gm) density = 2.42 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -452455.77 (J) H = -370383.29 (J) S = 71.80 (J/K) V = 11.63 (cc) Cp = 37.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.11 | 0.63 | 13.16 | 0.26 | 0.00 | 0.96 | 0.32 | 0.16 | 0.00 | 0.00 | 1.93 | 3.03 | 5.54 | 0.36 | 3.56 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.32 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.60Mg0.23)3Al2Si3O12
G = -58209.53 (J) H = -48502.31 (J) S = 8.49 (J/K) V = 1.09 (cc) Cp = 4.67 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.68 | 17.39 | 22.93 |

orthopyroxene mass = 5.86 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.02Mg0.87Fe"'0.02Ti0.00Al0.11Si1.94O6
G = -75840.90 (J) H = -62236.01 (J) S = 11.90 (J/K) V = 1.64 (cc) Cp = 6.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.91 | 96.03 | 101.97 | 4.61 | -4.39 | 6.27 | 0.41 |

feldspar mass = 39.11 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.69Ca0.19Al1.19Si2.81O8
G = -634492.16 (J) H = -535375.41 (J) S = 86.70 (J/K) V = 15.02 (cc) Cp = 47.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.12 | 18.71 | 12.17 |

quartz mass = 22.05 (gm) density = 2.56 (gm/cc)
SiO2
G = -360040.44 (J) H = -307355.84 (J) S = 46.09 (J/K) V = 8.61 (cc) Cp = 25.88 (J/K)

rhm-oxide mass = 0.47 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.10Fe'"0.16Al0.10Ti0.87O3
G = -4620.56 (J) H = -3609.48 (J) S = 0.88 (J/K) V = 0.10 (cc) Cp = 0.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.70 | 7.76 | 72.83 | 4.53 | 5.18 |

Total solids mass = 71.80 (gm) density = 2.71 (gm/cc)
G = -1133203.59 (J) H = -957079.04 (J) S = 154.07 (J/K) V = 26.47 (cc) Cp = 84.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1585659.36 (J) H = -1327462.32 (J) S = 225.86 (J/K) V = 38.09 (cc) Cp = 122.56 (J/K)

Oxygen delta moles = -0.00137328 delta grams = -0.0439433
G = 351.66 (J) H = -38.08 (J) S = -0.34 (J/K) V = -130.52 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 26.55 (gm) density = 2.42 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -426540.50 (J) H = -349733.91 (J) S = 67.78 (J/K) V = 10.99 (cc) Cp = 35.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.02 | 0.59 | 13.09 | 0.24 | 0.00 | 0.86 | 0.33 | 0.16 | 0.00 | 0.00 | 1.89 | 3.07 | 5.59 | 0.38 | 3.78 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.27 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -71071.62 (J) H = -59373.76 (J) S = 10.32 (J/K) V = 1.34 (cc) Cp = 5.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.27 | 17.47 | 23.26 |

orthopyroxene mass = 5.17 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -67095.28 (J) H = -55250.44 (J) S = 10.45 (J/K) V = 1.45 (cc) Cp = 5.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.63 | 96.05 | 100.00 | 4.46 | -4.24 | 5.95 | 0.42 |

clinopyroxene mass = 0.23 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.79Fe"0.40Mg0.53Fe'"0.06Ti0.04Al0.23Si1.86O6
G = -3357.48 (J) H = -2824.11 (J) S = 0.47 (J/K) V = 0.07 (cc) Cp = 0.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.30 | 12.31 | 40.28 | 8.54 | -0.05 | 5.80 | 8.82 |

feldspar mass = 39.55 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.69Ca0.18Al1.18Si2.82O8
G = -640493.14 (J) H = -541573.73 (J) S = 87.30 (J/K) V = 15.20 (cc) Cp = 47.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.13 | 17.77 | 13.10 |

quartz mass = 22.68 (gm) density = 2.56 (gm/cc)
SiO2
G = -369883.29 (J) H = -316428.14 (J) S = 47.17 (J/K) V = 8.86 (cc) Cp = 26.59 (J/K)

rhm-oxide mass = 0.50 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.10Fe'"0.15Al0.10Ti0.88O3
G = -4947.09 (J) H = -3878.71 (J) S = 0.94 (J/K) V = 0.11 (cc) Cp = 0.47 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.00 | 7.43 | 72.78 | 4.73 | 5.06 |

Total solids mass = 73.41 (gm) density = 2.72 (gm/cc)
G = -1156847.91 (J) H = -979328.88 (J) S = 156.66 (J/K) V = 27.02 (cc) Cp = 86.72 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1583388.41 (J) H = -1329062.79 (J) S = 224.44 (J/K) V = 38.01 (cc) Cp = 122.21 (J/K)

Oxygen delta moles = -0.00140993 delta grams = -0.0451161
G = 357.54 (J) H = -38.60 (J) S = -0.35 (J/K) V = -132.83 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 24.97 (gm) density = 2.41 (gm/cc) viscosity = 5.74 (log 10 poise) (analysis in wt %)
G = -401134.62 (J) H = -329403.64 (J) S = 63.87 (J/K) V = 10.36 (cc) Cp = 33.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.90 | 0.55 | 13.04 | 0.22 | 0.00 | 0.78 | 0.35 | 0.16 | 0.00 | 0.00 | 1.85 | 3.12 | 5.62 | 0.40 | 4.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.20 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -83634.07 (J) H = -70047.07 (J) S = 12.10 (J/K) V = 1.57 (cc) Cp = 6.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.92 | 17.38 | 23.70 |

orthopyroxene mass = 4.44 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.92Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -57902.69 (J) H = -47846.39 (J) S = 8.95 (J/K) V = 1.25 (cc) Cp = 5.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.34 | 96.11 | 97.95 | 4.34 | -4.13 | 5.67 | 0.42 |

clinopyroxene mass = 0.53 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.79Fe"0.38Mg0.55Fe'"0.05Ti0.04Al0.23Si1.86O6
G = -7678.36 (J) H = -6479.07 (J) S = 1.07 (J/K) V = 0.16 (cc) Cp = 0.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.98 | 11.68 | 38.37 | 8.64 | 0.01 | 5.36 | 8.95 |

feldspar mass = 39.97 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.69Ca0.17Al1.17Si2.83O8
G = -646031.66 (J) H = -547397.71 (J) S = 87.82 (J/K) V = 15.37 (cc) Cp = 48.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.13 | 16.76 | 14.11 |

quartz mass = 23.30 (gm) density = 2.56 (gm/cc)
SiO2
G = -379533.97 (J) H = -325370.75 (J) S = 48.22 (J/K) V = 9.10 (cc) Cp = 27.29 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.10Fe'"0.14Al0.10Ti0.88O3
G = -5219.74 (J) H = -4107.56 (J) S = 0.99 (J/K) V = 0.11 (cc) Cp = 0.49 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.32 | 7.10 | 72.69 | 4.93 | 4.96 |

Total solids mass = 74.98 (gm) density = 2.72 (gm/cc)
G = -1180000.49 (J) H = -1001248.54 (J) S = 159.15 (J/K) V = 27.57 (cc) Cp = 88.45 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1581135.11 (J) H = -1330652.18 (J) S = 223.02 (J/K) V = 37.93 (cc) Cp = 121.88 (J/K)

Oxygen delta moles = -0.00144022 delta grams = -0.0460853
G = 361.66 (J) H = -38.92 (J) S = -0.36 (J/K) V = -134.49 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 23.12 (gm) density = 2.40 (gm/cc) viscosity = 5.61 (log 10 poise) (analysis in wt %)
G = -371512.72 (J) H = -305412.36 (J) S = 59.38 (J/K) V = 9.62 (cc) Cp = 31.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.74 | 0.50 | 12.95 | 0.20 | 0.00 | 0.71 | 0.37 | 0.16 | 0.00 | 0.00 | 1.83 | 3.25 | 5.51 | 0.43 | 4.34 | 0.00 | 0.00 | 0.00 | 0.00 |

```
garnet          mass = 7.09 (gm)  density = 3.94 (gm/cc)     (analysis in mole %)
            (Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
            G = -95637.22 (J)  H = -80305.94 (J)  S = 13.77 (J/K)  V = 1.80 (cc)  Cp = 7.66 (J/K)
        almandine     grossular        pyrope
           58.50         17.27         24.23

orthopyroxene    mass = 3.76 (gm)  density = 3.55 (gm/cc)     (analysis in mole %)
            opx Na0.00Ca0.03Fe"0.96Mg0.95Fe'"0.01Ti0.00Al0.10Si1.94O6
            G = -49216.88 (J)  H = -40812.31 (J)  S = 7.55 (J/K)  V = 1.06 (cc)  Cp = 4.27 (J/K)
         diopside clinoenstatit  hedenbergite alumino-buffo     buffonite      essenite       jadeite
          -97.85         96.16         95.67          4.22         -4.02          5.39          0.42

clinopyroxene    mass = 0.78 (gm)  density = 3.39 (gm/cc)     (analysis in mole %)
            cpx Na0.09Ca0.80Fe"0.36Mg0.56Fe'"0.05Ti0.04Al0.23Si1.86O6
            G = -11292.42 (J)  H = -9558.86 (J)  S = 1.56 (J/K)  V = 0.23 (cc)  Cp = 0.87 (J/K)
         diopside clinoenstatit  hedenbergite alumino-buffo     buffonite      essenite       jadeite
           29.68         11.07         36.39          8.77          0.07          4.93          9.10

feldspar        mass = 39.10 (gm)  density = 2.60 (gm/cc)     (analysis in mole %)
            K0.14Na0.70Ca0.16Al1.16Si2.84O8
            G = -631138.60 (J)  H = -535958.43 (J)  S = 85.51 (J/K)  V = 15.04 (cc)  Cp = 47.29 (J/K)
          albite     anorthite      sanidine
           69.74         16.31         13.94

feldspar        mass = 1.55 (gm)  density = 2.55 (gm/cc)     (analysis in mole %)
            K0.61Na0.36Ca0.03Al1.03Si2.97O8
            G = -24385.78 (J)  H = -20670.78 (J)  S = 3.34 (J/K)  V = 0.61 (cc)  Cp = 1.84 (J/K)
          albite     anorthite      sanidine
           36.47          2.58         60.95

quartz          mass = 23.98 (gm)  density = 2.56 (gm/cc)
            SiO2
            G = -390177.57 (J)  H = -335200.66 (J)  S = 49.39 (J/K)  V = 9.37 (cc)  Cp = 28.06 (J/K)

rhm-oxide       mass = 0.56 (gm)  density = 4.63 (gm/cc)     (analysis in mole %)
            Mn0.05Fe"0.73Mg0.11Fe'"0.14Al0.10Ti0.88O3
            G = -5536.33 (J)  H = -4372.92 (J)  S = 1.05 (J/K)  V = 0.12 (cc)  Cp = 0.52 (J/K)
       geikielite      hematite      ilmenite   pyrophanite      corundum
           10.69          6.77         72.55          5.11          4.88

Total solids     mass = 76.83 (gm)  density = 2.72 (gm/cc)
            G = -1207384.81 (J)  H = -1026879.90 (J)  S = 162.16 (J/K)  V = 28.23 (cc)  Cp = 90.51 (J/K)

Viscosity of the System cannot be computed.

System          mass = 99.95 (gm)  density = 2.64 (gm/cc)
            G = -1578897.53 (J)  H = -1332292.27 (J)  S = 221.54 (J/K)  V = 37.85 (cc)  Cp = 121.52 (J/K)

Oxygen          delta moles = -0.00146819  delta grams = -0.0469802
            G = 365.05 (J)  H = -39.15 (J)  S = -0.36 (J/K)  V = -135.88 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8a2
```

T = 830.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -13.24  delta HM = -5.10  NNO = 0.00  QFM = -0.17  COH = 1.09
IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid  mass = 21.35 (gm)  density = 2.40 (gm/cc)  viscosity = 5.46 (log 10 poise)  (analysis in wt %)
G = -343092.69 (J)  H = -282308.17 (J)  S = 55.10 (J/K)  V = 8.91 (cc)  Cp = 28.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.53 | 0.46 | 12.84 | 0.19 | 0.00 | 0.65 | 0.40 | 0.16 | 0.00 | 0.00 | 1.83 | 3.41 | 5.36 | 0.47 | 4.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 7.90 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -106570.01 (J)  H = -89714.90 (J)  S = 15.28 (J/K)  V = 2.01 (cc)  Cp = 8.54 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.09 | 17.15 | 24.76 |

orthopyroxene  mass = 3.14 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.97Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -41260.67 (J)  H = -34333.81 (J)  S = 6.28 (J/K)  V = 0.89 (cc)  Cp = 3.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.37 | 96.21 | 93.40 | 4.10 | -3.90 | 5.13 | 0.43 |

clinopyroxene  mass = 1.00 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.34Mg0.58Fe'"0.05Ti0.05Al0.23Si1.86O6
G = -14564.70 (J)  H = -12367.14 (J)  S = 1.99 (J/K)  V = 0.30 (cc)  Cp = 1.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.24 | 10.50 | 34.46 | 8.89 | 0.13 | 4.52 | 9.25 |

feldspar  mass = 38.11 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.14Na0.70Ca0.16Al1.16Si2.84O8
G = -614394.59 (J)  H = -522900.50 (J)  S = 82.94 (J/K)  V = 14.66 (cc)  Cp = 46.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.48 | 15.98 | 13.54 |

feldspar  mass = 3.22 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.62Na0.36Ca0.02Al1.02Si2.98O8
G = -50606.74 (J)  H = -42994.04 (J)  S = 6.90 (J/K)  V = 1.27 (cc)  Cp = 3.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.97 | 2.38 | 61.65 |

quartz  mass = 24.64 (gm)  density = 2.56 (gm/cc)
SiO2
G = -400374.63 (J)  H = -344683.93 (J)  S = 50.48 (J/K)  V = 9.62 (cc)  Cp = 28.80 (J/K)

rhm-oxide  mass = 0.59 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.13Al0.10Ti0.89O3
G = -5812.12 (J)  H = -4607.68 (J)  S = 1.09 (J/K)  V = 0.13 (cc)  Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.06 | 6.45 | 72.40 | 5.28 | 4.80 |

Total solids  mass = 78.61 (gm)  density = 2.72 (gm/cc)

G = -1233583.45 (J)  H = -1051601.99 (J)  S = 164.97 (J/K)  V = 28.86 (cc)  Cp = 92.49 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.65 (gm/cc)
G = -1576676.15 (J)  H = -1333910.16 (J)  S = 220.07 (J/K)  V = 37.77 (cc)  Cp = 121.18 (J/K)

Oxygen  delta moles = -0.00149356  delta grams = -0.0477922
G = 367.66 (J)  H = -39.30 (J)  S = -0.37 (J/K)  V = -136.99 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 820.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = -0.18  COH = 1.06  IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 19.69 (gm)  density = 2.39 (gm/cc)  viscosity = 5.29 (log 10 poise)  (analysis in wt %)
G = -316561.91 (J)  H = -260681.73 (J)  S = 51.12 (J/K)  V = 8.25 (cc)  Cp = 26.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.27 | 0.42 | 12.73 | 0.18 | 0.00 | 0.60 | 0.43 | 0.16 | 0.00 | 0.00 | 1.82 | 3.59 | 5.20 | 0.51 | 5.10 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 8.64 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -116526.14 (J)  H = -98345.66 (J)  S = 16.63 (J/K)  V = 2.20 (cc)  Cp = 9.33 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.69 | 17.01 | 25.30 |

orthopyroxene  mass = 2.57 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg1.00Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -33939.08 (J)  H = -28338.16 (J)  S = 5.12 (J/K)  V = 0.73 (cc)  Cp = 2.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.95 | 96.27 | 91.17 | 3.97 | -3.78 | 4.89 | 0.44 |

clinopyroxene  mass = 1.21 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.33Mg0.59Fe'"0.04Ti0.05Al0.23Si1.87O6
G = -17625.81 (J)  H = -15011.92 (J)  S = 2.39 (J/K)  V = 0.36 (cc)  Cp = 1.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.66 | 9.97 | 32.63 | 9.02 | 0.20 | 4.12 | 9.41 |

feldspar  mass = 37.23 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.13Na0.71Ca0.16Al1.16Si2.84O8
G = -599598.94 (J)  H = -511441.77 (J)  S = 80.65 (J/K)  V = 14.32 (cc)  Cp = 45.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.21 | 15.65 | 13.14 |

feldspar  mass = 4.73 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.62Na0.35Ca0.02Al1.02Si2.98O8
G = -74211.47 (J)  H = -63190.10 (J)  S = 10.08 (J/K)  V = 1.86 (cc)  Cp = 5.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.45 | 2.19 | 62.37 |

quartz mass = 25.26 (gm) density = 2.56 (gm/cc)
SiO2
G = -409968.61 (J) H = -353682.98 (J) S = 51.49 (J/K) V = 9.87 (cc) Cp = 29.50 (J/K)

rhm-oxide mass = 0.61 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.11Fe'"0.12Al0.09Ti0.89O3
G = -6038.68 (J) H = -4804.77 (J) S = 1.13 (J/K) V = 0.13 (cc) Cp = 0.57 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.44 | 6.14 | 72.24 | 5.44 | 4.73 |

Total solids mass = 80.26 (gm) density = 2.72 (gm/cc)
G = -1257908.73 (J) H = -1074815.36 (J) S = 167.49 (J/K) V = 29.46 (cc) Cp = 94.34 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1574470.64 (J) H = -1335497.09 (J) S = 218.61 (J/K) V = 37.70 (cc) Cp = 120.87 (J/K)

Oxygen delta moles = -0.00151663 delta grams = -0.0485304
G = 369.60 (J) H = -39.38 (J) S = -0.37 (J/K) V = -137.84 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 18.13 (gm) density = 2.38 (gm/cc) viscosity = 5.11 (log 10 poise) (analysis in wt %)
G = -291583.99 (J) H = -240260.84 (J) S = 47.38 (J/K) V = 7.62 (cc) Cp = 24.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.94 | 0.38 | 12.62 | 0.17 | 0.00 | 0.56 | 0.46 | 0.16 | 0.00 | 0.00 | 1.82 | 3.77 | 5.03 | 0.55 | 5.53 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.32 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -125639.72 (J) H = -106305.24 (J) S = 17.85 (J/K) V = 2.37 (cc) Cp = 10.06 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.30 | 16.87 | 25.83 |

orthopyroxene mass = 2.05 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.89Mg1.02Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -27163.49 (J) H = -22757.34 (J) S = 4.07 (J/K) V = 0.58 (cc) Cp = 2.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.57 | 96.32 | 88.97 | 3.85 | -3.67 | 4.65 | 0.44 |

clinopyroxene mass = 1.40 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.31Mg0.61Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -20505.67 (J) H = -17516.72 (J) S = 2.76 (J/K) V = 0.42 (cc) Cp = 1.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.94 | 9.47 | 30.87 | 9.14 | 0.28 | 3.74 | 9.56 |

feldspar mass = 36.46 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.72Ca0.15Al1.15Si2.85O8
G = -586523.46 (J) H = -501398.17 (J) S = 78.59 (J/K) V = 14.02 (cc) Cp = 44.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.93 | 15.34 | 12.74 |

feldspar mass = 6.11 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -95559.19 (J) H = -81550.60 (J) S = 12.93 (J/K) V = 2.40 (cc) Cp = 7.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.89 | 2.01 | 63.10 |

quartz mass = 25.86 (gm) density = 2.56 (gm/cc)
SiO2
G = -419082.19 (J) H = -362300.53 (J) S = 52.42 (J/K) V = 10.10 (cc) Cp = 30.16 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.72Mg0.12Fe'"0.12Al0.09Ti0.89O3
G = -6222.99 (J) H = -4969.32 (J) S = 1.16 (J/K) V = 0.14 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.82 | 5.85 | 72.07 | 5.59 | 4.66 |

Total solids mass = 81.83 (gm) density = 2.73 (gm/cc)
G = -1280696.70 (J) H = -1096797.92 (J) S = 169.78 (J/K) V = 30.02 (cc) Cp = 96.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1572280.69 (J) H = -1337058.76 (J) S = 217.16 (J/K) V = 37.64 (cc) Cp = 120.59 (J/K)

Oxygen delta moles = -0.00153772 delta grams = -0.0492053
G = 370.95 (J) H = -39.38 (J) S = -0.38 (J/K) V = -138.48 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 800.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.20 COH = 0.99 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 16.64 (gm) density = 2.37 (gm/cc) viscosity = 4.90 (log 10 poise) (analysis in wt %)
G = -267848.39 (J) H = -220792.53 (J) S = 43.85 (J/K) V = 7.02 (cc) Cp = 22.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.53 | 0.34 | 12.51 | 0.16 | 0.00 | 0.51 | 0.49 | 0.16 | 0.00 | 0.00 | 1.84 | 3.98 | 4.85 | 0.60 | 6.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.94 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -134024.49 (J) H = -113684.63 (J) S = 18.95 (J/K) V = 2.53 (cc) Cp = 10.72 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.91 | 16.72 | 26.37 |

orthopyroxene mass = 1.57 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.05Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -20859.43 (J) H = -17534.08 (J) S = 3.10 (J/K) V = 0.45 (cc) Cp = 1.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.23 | 96.37 | 86.80 | 3.73 | -3.55 | 4.43 | 0.45 |

clinopyroxene mass = 1.58 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.29Mg0.62Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -23228.68 (J) H = -19900.74 (J) S = 3.10 (J/K) V = 0.47 (cc) Cp = 1.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.08 | 9.00 | 29.20 | 9.27 | 0.36 | 3.36 | 9.73 |

feldspar mass = 35.79 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -574978.91 (J) H = -492617.31 (J) S = 76.75 (J/K) V = 13.76 (cc) Cp = 43.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.64 | 15.02 | 12.34 |

feldspar mass = 7.36 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -114963.67 (J) H = -98330.99 (J) S = 15.50 (J/K) V = 2.89 (cc) Cp = 8.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.31 | 1.84 | 63.85 |

quartz mass = 26.43 (gm) density = 2.56 (gm/cc)
SiO2
G = -427831.82 (J) H = -370634.75 (J) S = 53.30 (J/K) V = 10.32 (cc) Cp = 30.79 (J/K)

rhm-oxide mass = 0.65 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.72Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -6370.67 (J) H = -5105.46 (J) S = 1.18 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.20 | 5.57 | 71.90 | 5.73 | 4.59 |

Total solids mass = 83.31 (gm) density = 2.73 (gm/cc)
G = -1302257.67 (J) H = -1117807.97 (J) S = 171.88 (J/K) V = 30.55 (cc) Cp = 97.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1570106.06 (J) H = -1338600.50 (J) S = 215.73 (J/K) V = 37.58 (cc) Cp = 120.35 (J/K)

Oxygen delta moles = -0.00155711 delta grams = -0.0498258
G = 371.79 (J) H = -39.33 (J) S = -0.38 (J/K) V = -138.93 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8a2

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95
IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 15.19 (gm) density = 2.36 (gm/cc) viscosity = 4.65 (log 10 poise) (analysis in wt %)
G = -244677.92 (J) H = -201696.73 (J) S = 40.43 (J/K) V = 6.44 (cc) Cp = 20.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.02 | 0.29 | 12.35 | 0.15 | 0.00 | 0.49 | 0.56 | 0.16 | 0.00 | 0.00 | 1.86 | 4.24 | 4.62 | 0.66 | 6.60 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.43 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.27)3Al2Si3O12
G = -140646.58 (J) H = -119590.44 (J) S = 19.81 (J/K) V = 2.65 (cc) Cp = 11.25 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.73 | 16.59 | 26.68 |

orthopyroxene mass = 1.32 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.06Fe'"0.01Ti0.00Al0.08Si1.96O6
G = -17533.27 (J) H = -14783.31 (J) S = 2.59 (J/K) V = 0.37 (cc) Cp = 1.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.61 | 96.44 | 85.30 | 3.61 | -3.44 | 4.23 | 0.45 |

clinopyroxene mass = 1.34 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.28Mg0.63Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -19738.94 (J) H = -16957.24 (J) S = 2.62 (J/K) V = 0.40 (cc) Cp = 1.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.79 | 8.60 | 27.93 | 9.26 | 0.47 | 3.04 | 9.92 |

clinopyroxene mass = 0.45 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.24Mg0.36Fe'"0.04Ti0.39Al0.72Si1.28O6
G = -6599.88 (J) H = -5687.20 (J) S = 0.86 (J/K) V = 0.13 (cc) Cp = 0.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.18 | 1.90 | 23.66 | 68.82 | 9.94 | -6.41 | 9.27 |

feldspar mass = 35.09 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -563126.82 (J) H = -483523.72 (J) S = 74.87 (J/K) V = 13.49 (cc) Cp = 42.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.40 | 14.61 | 11.99 |

feldspar mass = 8.55 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.02Al1.02Si2.98O8
G = -133314.57 (J) H = -114282.47 (J) S = 17.90 (J/K) V = 3.36 (cc) Cp = 10.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.80 | 1.68 | 64.52 |

quartz mass = 27.02 (gm) density = 2.56 (gm/cc)
SiO2
G = -436881.56 (J) H = -379260.06 (J) S = 54.20 (J/K) V = 10.55 (cc) Cp = 31.44 (J/K)

rhm-oxide mass = 0.55 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.72Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -5419.98 (J) H = -4358.18 (J) S = 1.00 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.45 | 5.36 | 71.71 | 5.96 | 4.51 |

Total solids mass = 84.76 (gm) density = 2.73 (gm/cc)

G = -1323261.59 (J)  H = -1138442.62 (J)  S = 173.84 (J/K)  V = 31.07 (cc)  Cp = 99.44 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.66 (gm/cc)
G = -1567939.51 (J)  H = -1340139.35 (J)  S = 214.27 (J/K)  V = 37.51 (cc)  Cp = 120.14 (J/K)

Oxygen  delta moles = -0.00158866  delta grams = -0.0508352
G = 375.42 (J)  H = -39.57 (J)  S = -0.39 (J/K)  V = -140.43 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 780.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = -0.23  COH = 0.92  IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 13.31 (gm)  density = 2.35 (gm/cc)  viscosity = 4.33 (log 10 poise)  (analysis in wt %)
G = -214485.55 (J)  H = -176684.53 (J)  S = 35.89 (J/K)  V = 5.68 (cc)  Cp = 18.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.39 | 0.25 | 11.95 | 0.16 | 0.00 | 0.49 | 0.63 | 0.15 | 0.00 | 0.00 | 1.93 | 4.67 | 4.32 | 0.75 | 7.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 11.55 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.58Mg0.26)3Al2Si3O12
G = -154996.61 (J)  H = -132060.14 (J)  S = 21.78 (J/K)  V = 2.93 (cc)  Cp = 12.42 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.55 | 16.76 | 25.69 |

clinopyroxene  mass = 1.45 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.82Fe"0.28Mg0.62Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -21247.52 (J)  H = -18291.44 (J)  S = 2.81 (J/K)  V = 0.43 (cc)  Cp = 1.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.76 | 8.21 | 28.28 | 8.95 | 0.71 | 2.83 | 10.27 |

clinopyroxene  mass = 0.46 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.24Mg0.35Fe'"0.03Ti0.39Al0.72Si1.28O6
G = -6662.25 (J)  H = -5752.58 (J)  S = 0.86 (J/K)  V = 0.13 (cc)  Cp = 0.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.74 | 1.79 | 24.15 | 68.73 | 10.27 | -6.78 | 9.59 |

biotite  mass = 0.70 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -11147.15 (J)  H = -9533.09 (J)  S = 1.53 (J/K)  V = 0.25 (cc)  Cp = 0.89 (J/K)

| annite | phlogopite |
|---|---|
| 3.15 | 96.85 |

feldspar  mass = 34.68 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.12Na0.74Ca0.14Al1.14Si2.86O8
G = -555890.24 (J)  H = -478344.89 (J)  S = 73.63 (J/K)  V = 13.33 (cc)  Cp = 42.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.29 | 13.96 | 11.75 |

feldspar mass = 9.12 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -142072.35 (J) H = -122061.62 (J) S = 19.00 (J/K) V = 3.58 (cc) Cp = 10.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.48 | 1.52 | 65.00 |

quartz mass = 28.10 (gm) density = 2.56 (gm/cc)
SiO2
G = -453711.98 (J) H = -394685.33 (J) S = 56.05 (J/K) V = 10.97 (cc) Cp = 32.66 (J/K)

rhm-oxide mass = 0.57 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.72Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -5586.36 (J) H = -4502.99 (J) S = 1.03 (J/K) V = 0.12 (cc) Cp = 0.52 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.95 | 5.35 | 72.34 | 6.05 | 4.32 |

Total solids mass = 86.63 (gm) density = 2.73 (gm/cc)
G = -1351314.46 (J) H = -1165232.07 (J) S = 176.69 (J/K) V = 31.76 (cc) Cp = 101.63 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.67 (gm/cc)
G = -1565800.02 (J) H = -1341916.60 (J) S = 212.58 (J/K) V = 37.43 (cc) Cp = 119.87 (J/K)

Oxygen delta moles = -0.00159826 delta grams = -0.0511425
G = 373.76 (J) H = -39.25 (J) S = -0.39 (J/K) V = -139.95 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 770.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.24 COH = 0.88 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 11.69 (gm) density = 2.33 (gm/cc) viscosity = 3.94 (log 10 poise) (analysis in wt %)
G = -188372.41 (J) H = -154945.81 (J) S = 32.04 (J/K) V = 5.02 (cc) Cp = 16.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.51 | 0.20 | 11.50 | 0.17 | 0.00 | 0.52 | 0.79 | 0.13 | 0.00 | 0.00 | 2.03 | 5.18 | 3.96 | 0.85 | 8.18 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.83 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -157835.92 (J) H = -134737.40 (J) S = 22.14 (J/K) V = 3.00 (cc) Cp = 12.67 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.73 | 17.21 | 24.06 |

clinopyroxene mass = 0.18 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.82Fe"0.29Mg0.60Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -2632.13 (J) H = -2270.08 (J) S = 0.35 (J/K) V = 0.05 (cc) Cp = 0.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.95 | 7.73 | 29.31 | 8.65 | 0.99 | 2.70 | 10.67 |

clinopyroxene mass = 1.85 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.88Fe"0.25Mg0.34Fe'"0.04Ti0.40Al0.71Si1.28O6
G = -26783.71 (J) H = -23168.98 (J) S = 3.47 (J/K) V = 0.52 (cc) Cp = 2.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.74 | 1.64 | 25.20 | 68.48 | 10.60 | -7.07 | 9.89 |

biotite mass = 1.10 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -17407.66 (J) H = -14917.37 (J) S = 2.39 (J/K) V = 0.40 (cc) Cp = 1.39 (J/K)

| annite | phlogopite |
|---|---|
| 3.69 | 96.31 |

feldspar mass = 34.20 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.75Ca0.13Al1.13Si2.87O8
G = -547423.24 (J) H = -472084.96 (J) S = 72.22 (J/K) V = 13.15 (cc) Cp = 41.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.12 | 13.41 | 11.47 |

feldspar mass = 9.88 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.66Na0.33Ca0.01Al1.01Si2.99O8
G = -153548.65 (J) H = -132215.60 (J) S = 20.45 (J/K) V = 3.88 (cc) Cp = 11.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.04 | 1.37 | 65.58 |

quartz mass = 28.97 (gm) density = 2.56 (gm/cc)
SiO2
G = -467175.98 (J) H = -407235.43 (J) S = 57.46 (J/K) V = 11.31 (cc) Cp = 33.63 (J/K)

rhm-oxide mass = 0.25 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.73Mg0.11Fe'"0.11Al0.08Ti0.90O3
G = -2438.14 (J) H = -1969.49 (J) S = 0.45 (J/K) V = 0.05 (cc) Cp = 0.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.14 | 5.41 | 72.85 | 6.47 | 4.13 |

apatite mass = 0.00 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -34.13 (J) H = -29.19 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Total solids mass = 88.26 (gm) density = 2.73 (gm/cc)
G = -1375279.57 (J) H = -1188628.49 (J) S = 178.93 (J/K) V = 32.36 (cc) Cp = 103.61 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.67 (gm/cc)
G = -1563651.98 (J) H = -1343574.30 (J) S = 210.97 (J/K) V = 37.38 (cc) Cp = 119.73 (J/K)

Oxygen delta moles = -0.00165617 delta grams = -0.0529956
G = 383.25 (J) H = -40.09 (J) S = -0.41 (J/K) V = -143.64 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 760.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.25 COH = 0.84

IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.30 (gm) density = 2.31 (gm/cc) viscosity = 3.55 (log 10 poise) (analysis in wt %)
G = -166195.98 (J) H = -136484.27 (J) S = 28.76 (J/K) V = 4.45 (cc) Cp = 14.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.24 | 0.17 | 11.39 | 0.17 | 0.00 | 0.51 | 0.92 | 0.11 | 0.00 | 0.00 | 2.14 | 5.51 | 3.67 | 0.97 | 9.20 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.80 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -156760.57 (J) H = -134096.36 (J) S = 21.94 (J/K) V = 2.98 (cc) Cp = 12.60 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.49 | 17.47 | 23.04 |

clinopyroxene mass = 2.07 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.33Fe'"0.03Ti0.41Al0.73Si1.26O6
G = -29993.54 (J) H = -26005.56 (J) S = 3.86 (J/K) V = 0.58 (cc) Cp = 2.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.98 | 1.47 | 25.53 | 70.83 | 10.56 | -7.27 | 9.85 |

biotite mass = 1.29 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -20355.32 (J) H = -17481.15 (J) S = 2.78 (J/K) V = 0.47 (cc) Cp = 1.62 (J/K)

| annite | phlogopite |
|---|---|
| 3.96 | 96.04 |

feldspar mass = 34.20 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.76Ca0.13Al1.13Si2.87O8
G = -546847.66 (J) H = -472641.91 (J) S = 71.82 (J/K) V = 13.14 (cc) Cp = 41.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.66 | 13.39 | 10.95 |

feldspar mass = 10.56 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -163813.08 (J) H = -141370.01 (J) S = 21.72 (J/K) V = 4.14 (cc) Cp = 12.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.13 | 1.25 | 66.62 |

quartz mass = 29.54 (gm) density = 2.60 (gm/cc)
SiO2
G = -475718.00 (J) H = -416305.67 (J) S = 57.51 (J/K) V = 11.36 (cc) Cp = 39.79 (J/K)

rhm-oxide mass = 0.19 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.74Mg0.11Fe'"0.10Al0.08Ti0.91O3
G = -1850.48 (J) H = -1498.93 (J) S = 0.34 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.63 | 5.24 | 73.53 | 6.51 | 4.08 |

Total solids mass = 89.64 (gm) density = 2.74 (gm/cc)
G = -1395338.64 (J) H = -1209399.59 (J) S = 179.97 (J/K) V = 32.71 (cc) Cp = 110.93 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.69 (gm/cc)
G = -1561534.63 (J) H = -1345883.86 (J) S = 208.73 (J/K) V = 37.17 (cc) Cp = 125.26 (J/K)

Oxygen delta moles = -0.00167951 delta grams = -0.0537422
G = 384.53 (J) H = -40.07 (J) S = -0.41 (J/K) V = -144.27 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 8.80 (gm) density = 2.29 (gm/cc) viscosity = 3.04 (log 10 poise) (analysis in wt %)
G = -142340.70 (J) H = -116500.53 (J) S = 25.26 (J/K) V = 3.84 (cc) Cp = 12.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.24 | 0.13 | 11.36 | 0.18 | 0.00 | 0.50 | 1.08 | 0.10 | 0.00 | 0.00 | 2.30 | 5.98 | 3.30 | 1.14 | 10.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.72 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -155074.05 (J) H = -132931.43 (J) S = 21.64 (J/K) V = 2.96 (cc) Cp = 12.48 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.17 | 17.65 | 22.18 |

clinopyroxene mass = 2.11 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.31Fe'"0.03Ti0.42Al0.76Si1.24O6
G = -30455.40 (J) H = -26468.76 (J) S = 3.90 (J/K) V = 0.59 (cc) Cp = 2.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.18 | 1.33 | 25.72 | 73.36 | 10.42 | -7.40 | 9.75 |

biotite mass = 1.43 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -22567.57 (J) H = -19423.58 (J) S = 3.07 (J/K) V = 0.52 (cc) Cp = 1.80 (J/K)

| annite | phlogopite |
|---|---|
| 4.16 | 95.84 |

feldspar mass = 34.31 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.76Ca0.13Al1.13Si2.87O8
G = -548106.93 (J) H = -474792.67 (J) S = 71.66 (J/K) V = 13.18 (cc) Cp = 42.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.12 | 13.47 | 10.41 |

feldspar mass = 11.26 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -174437.27 (J) H = -150875.85 (J) S = 23.03 (J/K) V = 4.42 (cc) Cp = 13.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.13 | 1.15 | 67.72 |

quartz mass = 30.13 (gm) density = 2.60 (gm/cc)

SiO2
G = -484775.11 (J)  H = -425147.62 (J)  S = 58.28 (J/K)  V = 11.57 (cc)  Cp = 40.25 (J/K)

rhm-oxide  mass = 0.17 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.06Fe"0.74Mg0.10Fe'"0.10Al0.08Ti0.91O3
G = -1689.59 (J)  H = -1372.60 (J)  S = 0.31 (J/K)  V = 0.04 (cc)  Cp = 0.16 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.19 | 5.01 | 74.29 | 6.41 | 4.09 |

Total solids  mass = 91.14 (gm)  density = 2.74 (gm/cc)
G = -1417105.92 (J)  H = -1231012.49 (J)  S = 181.88 (J/K)  V = 33.27 (cc)  Cp = 112.73 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.69 (gm/cc)
G = -1559446.62 (J)  H = -1347513.02 (J)  S = 207.14 (J/K)  V = 37.11 (cc)  Cp = 125.13 (J/K)

Oxygen  delta moles = -0.00169605  delta grams = -0.0542716
G = 384.17 (J)  H = -39.87 (J)  S = -0.41 (J/K)  V = -144.28 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 740.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = -0.28  COH = 0.76
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 7.19 (gm)  density = 2.25 (gm/cc)  viscosity = 2.33 (log 10 poise)  (analysis in wt %)
G = -116794.84 (J)  H = -94986.22 (J)  S = 21.53 (J/K)  V = 3.19 (cc)  Cp = 10.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.06 | 0.10 | 11.29 | 0.18 | 0.00 | 0.51 | 1.33 | 0.09 | 0.00 | 0.00 | 2.55 | 6.67 | 2.80 | 1.39 | 13.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 11.65 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -153561.41 (J)  H = -131911.37 (J)  S = 21.37 (J/K)  V = 2.94 (cc)  Cp = 12.37 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.82 | 17.74 | 21.44 |

clinopyroxene  mass = 2.15 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.26Mg0.30Fe'"0.03Ti0.43Al0.78Si1.22O6
G = -31050.84 (J)  H = -27049.94 (J)  S = 3.95 (J/K)  V = 0.60 (cc)  Cp = 2.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.01 | 1.21 | 25.86 | 75.54 | 10.27 | -7.52 | 9.66 |

biotite  mass = 1.55 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -24389.96 (J)  H = -21038.66 (J)  S = 3.31 (J/K)  V = 0.56 (cc)  Cp = 1.95 (J/K)

| annite | phlogopite |
|---|---|
| 4.30 | 95.70 |

feldspar  mass = 34.50 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.10Na0.77Ca0.14Al1.14Si2.86O8
G = -550557.88 (J) H = -477984.44 (J) S = 71.63 (J/K) V = 13.24 (cc) Cp = 43.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.56 | 13.54 | 9.90 |

feldspar mass = 11.96 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -184939.62 (J) H = -160317.33 (J) S = 24.30 (J/K) V = 4.69 (cc) Cp = 14.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.14 | 1.05 | 68.81 |

quartz mass = 30.78 (gm) density = 2.61 (gm/cc)
SiO2
G = -494571.95 (J) H = -434669.16 (J) S = 59.13 (J/K) V = 11.80 (cc) Cp = 40.77 (J/K)

rhm-oxide mass = 0.16 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.75Mg0.10Fe'"0.10Al0.08Ti0.91O3
G = -1508.45 (J) H = -1229.13 (J) S = 0.28 (J/K) V = 0.03 (cc) Cp = 0.14 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.79 | 4.77 | 75.14 | 6.18 | 4.12 |

Total solids mass = 92.75 (gm) density = 2.74 (gm/cc)
G = -1440580.10 (J) H = -1254200.03 (J) S = 183.96 (J/K) V = 33.87 (cc) Cp = 114.80 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.70 (gm/cc)
G = -1557374.94 (J) H = -1349186.25 (J) S = 205.49 (J/K) V = 37.06 (cc) Cp = 125.14 (J/K)

Oxygen delta moles = -0.00171236 delta grams = -0.0547935
G = 383.69 (J) H = -39.66 (J) S = -0.42 (J/K) V = -144.24 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8a2

T = 730.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.29 COH = 0.72 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 5.64 (gm) density = 2.20 (gm/cc) viscosity = 1.45 (log 10 poise) (analysis in wt %)
G = -92145.19 (J) H = -74172.46 (J) S = 17.92 (J/K) V = 2.56 (cc) Cp = 8.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.25 | 0.06 | 11.11 | 0.20 | 0.00 | 0.53 | 1.71 | 0.07 | 0.00 | 0.00 | 2.94 | 7.61 | 2.21 | 1.78 | 16.54 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.59 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -152216.95 (J) H = -131031.52 (J) S = 21.12 (J/K) V = 2.92 (cc) Cp = 12.28 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.43 | 17.74 | 20.83 |

clinopyroxene mass = 2.20 (gm) density = 3.60 (gm/cc) (analysis in mole %)

cpx Na0.10Ca0.89Fe"0.26Mg0.29Fe'"0.02Ti0.44Al0.79Si1.20O6
G = -31718.82 (J) H = -27696.53 (J) S = 4.01 (J/K) V = 0.61 (cc) Cp = 2.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -16.54 | 1.11 | 25.94 | 77.42 | 10.12 | -7.63 | 9.58 |

biotite mass = 1.65 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -25868.02 (J) H = -22363.66 (J) S = 3.49 (J/K) V = 0.59 (cc) Cp = 2.07 (J/K)

| annite | phlogopite |
|---|---|
| 4.38 | 95.62 |

feldspar mass = 34.79 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.77Ca0.14Al1.14Si2.86O8
G = -554570.19 (J) H = -482546.35 (J) S = 71.80 (J/K) V = 13.35 (cc) Cp = 43.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.99 | 13.60 | 9.41 |

feldspar mass = 12.55 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -193588.32 (J) H = -168189.22 (J) S = 25.32 (J/K) V = 4.92 (cc) Cp = 14.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.18 | 0.96 | 69.85 |

quartz mass = 31.40 (gm) density = 2.61 (gm/cc)
SiO2
G = -503908.14 (J) H = -443817.00 (J) S = 59.90 (J/K) V = 12.02 (cc) Cp = 41.25 (J/K)

rhm-oxide mass = 0.14 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.76Mg0.09Fe'"0.09Al0.08Ti0.91O3
G = -1304.49 (J) H = -1066.18 (J) S = 0.24 (J/K) V = 0.03 (cc) Cp = 0.12 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.44 | 4.51 | 76.08 | 5.82 | 4.15 |

Total solids mass = 94.31 (gm) density = 2.74 (gm/cc)
G = -1463174.94 (J) H = -1276710.45 (J) S = 185.88 (J/K) V = 34.44 (cc) Cp = 116.96 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1555320.13 (J) H = -1350882.92 (J) S = 203.80 (J/K) V = 37.01 (cc) Cp = 125.32 (J/K)

Oxygen delta moles = -0.00172856 delta grams = -0.0553119
G = 383.10 (J) H = -39.43 (J) S = -0.42 (J/K) V = -144.17 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.07 (log 10 poise)  (analysis in wt %)
G = -1699316.33 (J)  H = -1255505.18 (J)  S = 282.12 (J/K)  V = 40.88 (cc)  Cp = 143.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.75 | 0.00 | 3.76 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.07 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1699316.33 (J)  H = -1255505.18 (J)  S = 282.12 (J/K)  V = 40.88 (cc)  Cp = 143.26 (J/K)

Oxygen  delta moles = -2.18575e-16  delta grams = -6.99414e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.13 (log 10 poise)  (analysis in wt %)
G = -1696501.24 (J)  H = -1256939.02 (J)  S = 281.20 (J/K)  V = 40.85 (cc)  Cp = 143.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.75 | 0.00 | 3.75 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1696501.24 (J)  H = -1256939.02 (J)  S = 281.20 (J/K)  V = 40.85 (cc)  Cp = 143.25 (J/K)

Oxygen  delta moles = 2.77408e-06  delta grams = 8.87671e-05
G = -1.01 (J)  H = 0.12 (J)  S = 0.00 (J/K)  V = 0.36 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.19 (log 10 poise)  (analysis in wt %)
G = -1693695.48 (J)  H = -1258372.94 (J)  S = 280.28 (J/K)  V = 40.82 (cc)  Cp = 143.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.75 | 0.00 | 3.75 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.19 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1693695.48 (J)  H = -1258372.94 (J)  S = 280.28 (J/K)  V = 40.82 (cc)  Cp = 143.25 (J/K)

Oxygen  delta moles = 5.86337e-06  delta grams = 0.000187621
G = -2.11 (J)  H = 0.25 (J)  S = 0.00 (J/K)  V = 0.76 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -1690899.12 (J)  H = -1259806.94 (J)  S = 279.36 (J/K)  V = 40.79 (cc)  Cp = 143.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.75 | 0.00 | 3.75 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1690899.12 (J)  H = -1259806.94 (J)  S = 279.36 (J/K)  V = 40.79 (cc)  Cp = 143.24 (J/K)

Oxygen  delta moles = 9.27678e-06  delta grams = 0.000296846
G = -3.32 (J)  H = 0.39 (J)  S = 0.00 (J/K)  V = 1.19 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1688112.22 (J)  H = -1261241.03 (J)  S = 278.43 (J/K)  V = 40.77 (cc)  Cp = 143.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.76 | 0.00 | 3.75 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1688112.22 (J)  H = -1261241.03 (J)  S = 278.43 (J/K)  V = 40.77 (cc)  Cp = 143.23 (J/K)

Oxygen  delta moles = 1.30236e-05  delta grams = 0.000416738
G = -4.62 (J)  H = 0.54 (J)  S = 0.00 (J/K)  V = 1.66 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1685334.84 (J)  H = -1262675.20 (J)  S = 277.49 (J/K)  V = 40.74 (cc)  Cp = 143.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.76 | 0.00 | 3.75 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1685334.84 (J)  H = -1262675.20 (J)  S = 277.49 (J/K)  V = 40.74 (cc)  Cp = 143.23 (J/K)

Oxygen  delta moles = 1.71134e-05  delta grams = 0.000547607
G = -6.03 (J)  H = 0.71 (J)  S = 0.00 (J/K)  V = 2.17 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.43 (log 10 poise) (analysis in wt %)
G = -1682567.05 (J) H = -1264109.48 (J) S = 276.55 (J/K) V = 40.71 (cc) Cp = 143.22 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.76 0.00 3.75 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1682567.05 (J) H = -1264109.48 (J) S = 276.55 (J/K) V = 40.71 (cc) Cp = 143.22 (J/K)

Oxygen delta moles = 2.15562e-05 delta grams = 0.000689774
G = -7.54 (J) H = 0.89 (J) S = 0.01 (J/K) V = 2.71 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.49 (log 10 poise) (analysis in wt %)
G = -1679808.91 (J) H = -1265543.87 (J) S = 275.60 (J/K) V = 40.68 (cc) Cp = 143.21 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.76 0.00 3.75 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.49 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1679808.91 (J) H = -1265543.87 (J) S = 275.60 (J/K) V = 40.68 (cc) Cp = 143.21 (J/K)

Oxygen delta moles = 2.63627e-05 delta grams = 0.000843575
G = -9.16 (J) H = 1.07 (J) S = 0.01 (J/K) V = 3.29 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.55 (log 10 poise) (analysis in wt %)
G = -1677060.51 (J) H = -1266978.37 (J) S = 274.64 (J/K) V = 40.65 (cc) Cp = 143.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.76 | 0.00 | 3.75 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.55 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1677060.51 (J) H = -1266978.37 (J) S = 274.64 (J/K) V = 40.65 (cc) Cp = 143.20 (J/K)

Oxygen delta moles = 3.15437e-05 delta grams = 0.00100936
G = -10.87 (J) H = 1.27 (J) S = 0.01 (J/K) V = 3.92 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1674321.89 (J) H = -1268412.99 (J) S = 273.68 (J/K) V = 40.62 (cc) Cp = 143.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.76 | 0.00 | 3.74 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1674321.89 (J) H = -1268412.99 (J) S = 273.68 (J/K) V = 40.62 (cc) Cp = 143.20 (J/K)

Oxygen delta moles = 3.71107e-05 delta grams = 0.0011875
G = -12.70 (J) H = 1.48 (J) S = 0.01 (J/K) V = 4.58 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1671593.02 (J) H = -1269795.45 (J) S = 272.75 (J/K) V = 40.59 (cc) Cp = 135.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.77 | 0.00 | 3.74 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1671593.02 (J) H = -1269795.45 (J) S = 272.75 (J/K) V = 40.59 (cc) Cp = 135.55 (J/K)

Oxygen delta moles = 4.30756e-05 delta grams = 0.00137837
G = -14.63 (J) H = 1.71 (J) S = 0.01 (J/K) V = 5.28 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1668873.59 (J) H = -1271153.86 (J) S = 271.82 (J/K) V = 40.56 (cc) Cp = 135.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.77 | 0.00 | 3.74 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1668873.59 (J) H = -1271153.86 (J) S = 271.82 (J/K) V = 40.56 (cc) Cp = 135.53 (J/K)

Oxygen delta moles = 4.94509e-05 delta grams = 0.00158237
G = -16.66 (J) H = 1.94 (J) S = 0.01 (J/K) V = 6.02 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.81 (log 10 poise) (analysis in wt %)
G = -1666163.64 (J) H = -1272512.22 (J) S = 270.90 (J/K) V = 40.53 (cc) Cp = 135.50 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.77 0.00 3.74 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.81 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1666163.64 (J) H = -1272512.22 (J) S = 270.90 (J/K) V = 40.53 (cc) Cp = 135.50 (J/K)

Oxygen delta moles = 5.62495e-05 delta grams = 0.00179992
G = -18.81 (J) H = 2.19 (J) S = 0.01 (J/K) V = 6.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1663463.25 (J) H = -1273870.52 (J) S = 269.96 (J/K) V = 40.50 (cc) Cp = 135.47 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.77 0.00 3.74 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1663463.25 (J) H = -1273870.52 (J) S = 269.96 (J/K) V = 40.50 (cc) Cp = 135.47 (J/K)

Oxygen delta moles = 6.34852e-05 delta grams = 0.00203145
G = -21.07 (J) H = 2.44 (J) S = 0.02 (J/K) V = 7.62 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1660772.48 (J) H = -1275228.78 (J) S = 269.02 (J/K) V = 40.47 (cc) Cp = 135.45 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

69.25 0.50 14.47 0.77 0.00 3.73 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1660772.48 (J) H = -1275228.78 (J) S = 269.02 (J/K) V = 40.47 (cc) Cp = 135.45 (J/K)

Oxygen delta moles = 7.11721e-05 delta grams = 0.00227742
G = -23.44 (J) H = 2.71 (J) S = 0.02 (J/K) V = 8.48 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 99.57 (gm) density = 2.47 (gm/cc) viscosity = 5.04 (log 10 poise) (analysis in wt %)
G = -1651495.36 (J) H = -1271611.10 (J) S = 266.93 (J/K) V = 40.30 (cc) Cp = 134.75 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.32 0.50 14.53 0.77 0.00 3.68 0.01 1.61 0.00 0.00 2.42 3.94 2.12 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.43 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.53Mg1.38Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -6581.27 (J) H = -5130.96 (J) S = 1.02 (J/K) V = 0.13 (cc) Cp = 0.53 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-56.03 97.12 52.60 3.81 -3.58 5.80 0.28

Total solids mass = 0.43 (gm) density = 3.33 (gm/cc)
G = -6581.27 (J) H = -5130.96 (J) S = 1.02 (J/K) V = 0.13 (cc) Cp = 0.53 (J/K)

Viscosity of the System: 5.05 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1658076.63 (J) H = -1276742.06 (J) S = 267.95 (J/K) V = 40.43 (cc) Cp = 135.28 (J/K)

Oxygen delta moles = 5.1481e-05 delta grams = 0.00164733
G = -16.82 (J) H = 1.95 (J) S = 0.01 (J/K) V = 6.09 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1140.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.26 COH = 2.13 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 99.09 (gm) density = 2.47 (gm/cc) viscosity = 5.14 (log 10 poise) (analysis in wt %)
G = -1641521.83 (J) H = -1267441.47 (J) S = 264.71 (J/K) V = 40.10 (cc) Cp = 133.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.40 | 0.51 | 14.59 | 0.76 | 0.00 | 3.62 | 0.01 | 1.49 | 0.00 | 0.00 | 2.43 | 3.96 | 2.13 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.92 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.55Mg1.36Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -13866.62 (J) H = -10828.42 (J) S = 2.15 (J/K) V = 0.27 (cc) Cp = 1.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.98 | 96.99 | 54.54 | 3.91 | -3.68 | 5.93 | 0.29 |

Total solids mass = 0.92 (gm) density = 3.34 (gm/cc)
G = -13866.62 (J) H = -10828.42 (J) S = 2.15 (J/K) V = 0.27 (cc) Cp = 1.12 (J/K)

Viscosity of the System: 5.15 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1655388.45 (J) H = -1278269.89 (J) S = 266.86 (J/K) V = 40.38 (cc) Cp = 135.09 (J/K)

Oxygen delta moles = 2.5973e-05 delta grams = 0.000831104
G = -8.42 (J) H = 0.97 (J) S = 0.01 (J/K) V = 3.05 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 98.61 (gm) density = 2.47 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -1631804.57 (J) H = -1263438.46 (J) S = 262.53 (J/K) V = 39.91 (cc) Cp = 133.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.48 | 0.51 | 14.64 | 0.75 | 0.00 | 3.55 | 0.01 | 1.39 | 0.00 | 0.00 | 2.44 | 3.97 | 2.14 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.39 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.34Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -20905.47 (J) H = -16351.39 (J) S = 3.25 (J/K) V = 0.41 (cc) Cp = 1.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.99 | 96.86 | 56.52 | 4.02 | -3.79 | 6.08 | 0.31 |

Total solids mass = 1.39 (gm) density = 3.35 (gm/cc)
G = -20905.47 (J) H = -16351.39 (J) S = 3.25 (J/K) V = 0.41 (cc) Cp = 1.70 (J/K)

Viscosity of the System: 5.26 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1652710.04 (J) H = -1279789.85 (J) S = 265.77 (J/K) V = 40.33 (cc) Cp = 134.91 (J/K)

Oxygen delta moles = -1.59479e-06 delta grams = -5.10314e-05

G = 0.51 (J)  H = -0.06 (J)  S = -0.00 (J/K)  V = -0.19 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1120.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.53  delta HM = -4.90  NNO = 0.00  QFM = 0.25  COH = 2.09  IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.15 (gm)  density = 2.47 (gm/cc)  viscosity = 5.34 (log 10 poise)  (analysis in wt %)
G = -1622324.13 (J)  H = -1259588.41 (J)  S = 260.37 (J/K)  V = 39.73 (cc)  Cp = 132.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.56 | 0.51 | 14.70 | 0.74 | 0.00 | 3.48 | 0.01 | 1.29 | 0.00 | 0.00 | 2.44 | 3.99 | 2.15 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.85 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.59Mg1.32Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -27717.25 (J)  H = -21714.06 (J)  S = 4.31 (J/K)  V = 0.55 (cc)  Cp = 2.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.05 | 96.73 | 58.55 | 4.14 | -3.90 | 6.23 | 0.32 |

Total solids  mass = 1.85 (gm)  density = 3.36 (gm/cc)
G = -27717.25 (J)  H = -21714.06 (J)  S = 4.31 (J/K)  V = 0.55 (cc)  Cp = 2.26 (J/K)

Viscosity of the System: 5.36 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1650041.38 (J)  H = -1281302.47 (J)  S = 264.68 (J/K)  V = 40.28 (cc)  Cp = 134.73 (J/K)

Oxygen  delta moles = -3.13461e-05  delta grams = -0.00100304
G = 10.00 (J)  H = -1.15 (J)  S = -0.01 (J/K)  V = -3.63 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1110.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.24  COH = 2.07  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.69 (gm)  density = 2.47 (gm/cc)  viscosity = 5.44 (log 10 poise)  (analysis in wt %)
G = -1613063.04 (J)  H = -1255879.02 (J)  S = 258.24 (J/K)  V = 39.54 (cc)  Cp = 131.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.65 | 0.51 | 14.76 | 0.73 | 0.00 | 3.40 | 0.01 | 1.19 | 0.00 | 0.00 | 2.45 | 4.01 | 2.16 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.31 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.61Mg1.29Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -34319.40 (J)  H = -26929.24 (J)  S = 5.34 (J/K)  V = 0.69 (cc)  Cp = 2.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.15 | 96.59 | 60.61 | 4.26 | -4.03 | 6.39 | 0.33 |

Total solids mass = 2.31 (gm) density = 3.37 (gm/cc)
G = -34319.40 (J) H = -26929.24 (J) S = 5.34 (J/K) V = 0.69 (cc) Cp = 2.80 (J/K)

Viscosity of the System: 5.47 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1647382.44 (J) H = -1282808.25 (J) S = 263.58 (J/K) V = 40.23 (cc) Cp = 134.56 (J/K)

Oxygen delta moles = -6.33916e-05 delta grams = -0.00202845
G = 20.06 (J) H = -2.30 (J) S = -0.02 (J/K) V = -7.29 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1100.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.05 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 97.24 (gm) density = 2.47 (gm/cc) viscosity = 5.54 (log 10 poise) (analysis in wt %)
G = -1604005.99 (J) H = -1252299.36 (J) S = 256.13 (J/K) V = 39.37 (cc) Cp = 131.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.73 | 0.52 | 14.81 | 0.72 | 0.00 | 3.31 | 0.01 | 1.10 | 0.00 | 0.00 | 2.46 | 4.03 | 2.17 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.76 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.63Mg1.27Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -40727.22 (J) H = -32008.24 (J) S = 6.35 (J/K) V = 0.82 (cc) Cp = 3.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.29 | 96.46 | 62.70 | 4.39 | -4.15 | 6.55 | 0.34 |

Total solids mass = 2.76 (gm) density = 3.38 (gm/cc)
G = -40727.22 (J) H = -32008.24 (J) S = 6.35 (J/K) V = 0.82 (cc) Cp = 3.33 (J/K)

Viscosity of the System: 5.58 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1644733.21 (J) H = -1284307.61 (J) S = 262.48 (J/K) V = 40.18 (cc) Cp = 134.38 (J/K)

Oxygen delta moles = -9.78248e-05 delta grams = -0.00313028
G = 30.71 (J) H = -3.52 (J) S = -0.02 (J/K) V = -11.17 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 96.79 (gm) density = 2.47 (gm/cc) viscosity = 5.65 (log 10 poise) (analysis in wt %)
G = -1595139.83 (J) H = -1248840.01 (J) S = 254.04 (J/K) V = 39.19 (cc) Cp = 130.36 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.82 0.52 14.86 0.70 0.00 3.23 0.01 1.02 0.00 0.00 2.46 4.05 2.18 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.20 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.65Mg1.24Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -46953.87 (J) H = -36960.87 (J) S = 7.33 (J/K) V = 0.94 (cc) Cp = 3.85 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-68.46 96.33 64.82 4.52 -4.29 6.73 0.35

Total solids mass = 3.20 (gm) density = 3.39 (gm/cc)
G = -46953.87 (J) H = -36960.87 (J) S = 7.33 (J/K) V = 0.94 (cc) Cp = 3.85 (J/K)

Viscosity of the System: 5.69 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1642093.70 (J) H = -1285800.88 (J) S = 261.37 (J/K) V = 40.14 (cc) Cp = 134.21 (J/K)

Oxygen delta moles = -0.000134718 delta grams = -0.00431082
G = 41.95 (J) H = -4.80 (J) S = -0.03 (J/K) V = -15.27 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1080.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.22 COH = 2.01 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 96.36 (gm) density = 2.47 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -1586453.66 (J) H = -1245493.05 (J) S = 251.98 (J/K) V = 39.02 (cc) Cp = 129.68 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.91 0.52 14.92 0.69 0.00 3.14 0.01 0.94 0.00 0.00 2.47 4.07 2.19 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.64 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.67Mg1.22Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -53010.28 (J) H = -41795.30 (J) S = 8.29 (J/K) V = 1.07 (cc) Cp = 4.36 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-70.66 96.20 66.95 4.67 -4.44 6.91 0.36

Total solids mass = 3.64 (gm) density = 3.40 (gm/cc)
G = -53010.28 (J) H = -41795.30 (J) S = 8.29 (J/K) V = 1.07 (cc) Cp = 4.36 (J/K)

Viscosity of the System: 5.80 (log 10 poise)

System mass = 99.99 (gm) density = 2.49 (gm/cc)
G = -1639463.94 (J) H = -1287288.35 (J) S = 260.26 (J/K) V = 40.09 (cc) Cp = 134.04 (J/K)

Oxygen delta moles = -0.000174119 delta grams = -0.00557161
G = 53.78 (J) H = -6.14 (J) S = -0.04 (J/K) V = -19.59 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1070.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.22  COH = 1.99  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.92 (gm)  density = 2.47 (gm/cc)  viscosity = 5.86 (log 10 poise)  (analysis in wt %)
G = -1577938.89 (J)  H = -1242252.16 (J)  S = 249.92 (J/K)  V = 38.85 (cc)  Cp = 129.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.00 | 0.52 | 14.97 | 0.67 | 0.00 | 3.04 | 0.01 | 0.87 | 0.00 | 0.00 | 2.48 | 4.08 | 2.20 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.07 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.69Mg1.19Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -58905.09 (J)  H = -46518.07 (J)  S = 9.22 (J/K)  V = 1.19 (cc)  Cp = 4.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.87 | 96.08 | 69.09 | 4.82 | -4.59 | 7.10 | 0.37 |

Total solids  mass = 4.07 (gm)  density = 3.41 (gm/cc)
G = -58905.09 (J)  H = -46518.07 (J)  S = 9.22 (J/K)  V = 1.19 (cc)  Cp = 4.86 (J/K)

Viscosity of the System: 5.92 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.50 (gm/cc)
G = -1636843.98 (J)  H = -1288770.23 (J)  S = 259.15 (J/K)  V = 40.04 (cc)  Cp = 133.87 (J/K)

Oxygen  delta moles = -0.000216047  delta grams = -0.00691324
G = 66.18 (J)  H = -7.54 (J)  S = -0.05 (J/K)  V = -24.13 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1060.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.21  COH = 1.97  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.24 (gm)  density = 2.47 (gm/cc)  viscosity = 5.97 (log 10 poise)  (analysis in wt %)
G = -1532209.39 (J)  H = -1209489.53 (J)  S = 242.07 (J/K)  V = 37.80 (cc)  Cp = 125.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.33 | 0.54 | 14.83 | 0.66 | 0.00 | 2.97 | 0.01 | 0.79 | 0.00 | 0.00 | 2.41 | 4.02 | 2.25 | 0.11 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.65 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.72Mg1.16Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -66749.54 (J)  H = -52778.51 (J)  S = 10.48 (J/K)  V = 1.36 (cc)  Cp = 5.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.02 | 96.13 | 72.08 | 4.88 | -4.65 | 7.20 | 0.37 |

feldspar  mass = 2.10 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.03Na0.69Ca0.28Al1.28Si2.72O8
G = -35260.40 (J) H = -28560.69 (J) S = 5.03 (J/K) V = 0.80 (cc) Cp = 2.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.76 | 28.42 | 2.82 |

Total solids mass = 6.75 (gm) density = 3.12 (gm/cc)
G = -102009.94 (J) H = -81339.21 (J) S = 15.51 (J/K) V = 2.16 (cc) Cp = 8.10 (J/K)

Viscosity of the System: 6.07 (log 10 poise)

System mass = 99.99 (gm) density = 2.50 (gm/cc)
G = -1634219.32 (J) H = -1290828.73 (J) S = 257.58 (J/K) V = 39.97 (cc) Cp = 133.29 (J/K)

Oxygen delta moles = -0.00029007 delta grams = -0.0092819
G = 88.12 (J) H = -10.01 (J) S = -0.07 (J/K) V = -32.15 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1050.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.95 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 89.64 (gm) density = 2.46 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -1471457.05 (J) H = -1164620.66 (J) S = 231.90 (J/K) V = 36.40 (cc) Cp = 120.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.78 | 0.56 | 14.60 | 0.65 | 0.00 | 2.90 | 0.01 | 0.72 | 0.00 | 0.00 | 2.31 | 3.91 | 2.33 | 0.11 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.28 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.75Mg1.13Fe'"0.03Ti0.00Al0.13Si1.93O6
G = -75075.38 (J) H = -59427.10 (J) S = 11.83 (J/K) V = 1.54 (cc) Cp = 6.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.57 | 96.26 | 75.44 | 4.89 | -4.65 | 7.26 | 0.37 |

feldspar mass = 5.06 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.69Ca0.28Al1.28Si2.72O8
G = -85070.40 (J) H = -69057.89 (J) S = 12.10 (J/K) V = 1.95 (cc) Cp = 6.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.45 | 27.59 | 2.96 |

Total solids mass = 10.35 (gm) density = 2.97 (gm/cc)
G = -160145.79 (J) H = -128484.99 (J) S = 23.93 (J/K) V = 3.48 (cc) Cp = 12.44 (J/K)

Viscosity of the System: 6.25 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1631602.83 (J) H = -1293105.65 (J) S = 255.83 (J/K) V = 39.88 (cc) Cp = 132.54 (J/K)

Oxygen delta moles = -0.000381208 delta grams = -0.0121982
G = 114.83 (J) H = -13.02 (J) S = -0.10 (J/K) V = -41.94 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1040.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.20  COH = 1.93  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 86.27 (gm)  density = 2.46 (gm/cc)  viscosity = 6.20 (log 10 poise)  (analysis in wt %)
G = -1414834.28 (J)  H = -1122806.73 (J)  S = 222.39 (J/K)  V = 35.08 (cc)  Cp = 115.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.22 | 0.58 | 14.39 | 0.63 | 0.00 | 2.81 | 0.01 | 0.65 | 0.00 | 0.00 | 2.23 | 3.80 | 2.40 | 0.12 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.88 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.79Mg1.10Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -82796.94 (J)  H = -65616.14 (J)  S = 13.08 (J/K)  V = 1.70 (cc)  Cp = 6.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.00 | 96.40 | 78.69 | 4.90 | -4.67 | 7.32 | 0.36 |

feldspar  mass = 7.83 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.03Na0.70Ca0.27Al1.27Si2.73O8
G = -131371.57 (J)  H = -106879.32 (J)  S = 18.65 (J/K)  V = 3.01 (cc)  Cp = 9.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.05 | 26.85 | 3.10 |

Total solids  mass = 13.71 (gm)  density = 2.91 (gm/cc)
G = -214168.51 (J)  H = -172495.47 (J)  S = 31.74 (J/K)  V = 4.71 (cc)  Cp = 16.49 (J/K)

Viscosity of the System: 6.44 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.51 (gm/cc)
G = -1629002.80 (J)  H = -1295302.20 (J)  S = 254.12 (J/K)  V = 39.79 (cc)  Cp = 131.84 (J/K)

Oxygen  delta moles = -0.000474  delta grams = -0.0151674
G = 141.59 (J)  H = -16.02 (J)  S = -0.12 (J/K)  V = -51.75 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1030.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.19  COH = 1.91  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 80.49 (gm)  density = 2.46 (gm/cc)  viscosity = 6.24 (log 10 poise)  (analysis in wt %)
G = -1318229.78 (J)  H = -1048381.18 (J)  S = 207.07 (J/K)  V = 32.77 (cc)  Cp = 107.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.25 | 0.62 | 14.35 | 0.63 | 0.00 | 2.77 | 0.01 | 0.59 | 0.00 | 0.00 | 2.15 | 3.72 | 2.54 | 0.12 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.55 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)

opx Na0.00Ca0.03Fe"0.82Mg1.07Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -91298.31 (J) H = -72435.80 (J) S = 14.47 (J/K) V = 1.89 (cc) Cp = 7.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.64 | 96.54 | 82.00 | 5.01 | -4.76 | 7.51 | 0.35 |

feldspar mass = 11.34 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.26Al1.26Si2.74O8
G = -190015.75 (J) H = -154935.44 (J) S = 26.92 (J/K) V = 4.36 (cc) Cp = 13.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.34 | 26.34 | 3.32 |

quartz mass = 1.60 (gm) density = 2.55 (gm/cc)
SiO2
G = -26871.91 (J) H = -22179.58 (J) S = 3.60 (J/K) V = 0.63 (cc) Cp = 1.91 (J/K)

Total solids mass = 19.49 (gm) density = 2.84 (gm/cc)
G = -308185.96 (J) H = -249550.82 (J) S = 44.99 (J/K) V = 6.88 (cc) Cp = 23.55 (J/K)

Viscosity of the System: 6.61 (log 10 poise)

System mass = 99.98 (gm) density = 2.52 (gm/cc)
G = -1626415.74 (J) H = -1297931.99 (J) S = 252.07 (J/K) V = 39.64 (cc) Cp = 131.08 (J/K)

Oxygen delta moles = -0.000576889 delta grams = -0.0184598
G = 170.86 (J) H = -19.29 (J) S = -0.15 (J/K) V = -62.50 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1020.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.89 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 74.60 (gm) density = 2.45 (gm/cc) viscosity = 6.26 (log 10 poise) (analysis in wt %)
G = -1220194.67 (J) H = -972357.64 (J) S = 191.65 (J/K) V = 30.41 (cc) Cp = 99.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.15 | 0.67 | 14.37 | 0.62 | 0.00 | 2.72 | 0.01 | 0.54 | 0.00 | 0.00 | 2.09 | 3.63 | 2.71 | 0.13 | 1.35 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.19 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.03Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -99302.36 (J) H = -78883.53 (J) S = 15.79 (J/K) V = 2.06 (cc) Cp = 8.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.13 | 96.67 | 85.12 | 5.14 | -4.88 | 7.73 | 0.35 |

feldspar mass = 14.73 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.70Ca0.26Al1.26Si2.74O8
G = -246300.21 (J) H = -201278.68 (J) S = 34.82 (J/K) V = 5.66 (cc) Cp = 18.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.50 | 25.93 | 3.57 |

quartz mass = 3.47 (gm) density = 2.55 (gm/cc)

SiO2
G = -58052.72 (J)  H = -48021.08 (J)  S = 7.76 (J/K)  V = 1.36 (cc)  Cp = 4.12 (J/K)

Total solids  mass = 25.38 (gm)  density = 2.79 (gm/cc)
G = -403655.29 (J)  H = -328183.30 (J)  S = 58.36 (J/K)  V = 9.08 (cc)  Cp = 30.62 (J/K)

Viscosity of the System: 6.80 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.53 (gm/cc)
G = -1623849.96 (J)  H = -1300540.94 (J)  S = 250.02 (J/K)  V = 39.49 (cc)  Cp = 130.25 (J/K)

Oxygen  delta moles = -0.000679445  delta grams = -0.0217414
G = 199.52 (J)  H = -22.48 (J)  S = -0.17 (J/K)  V = -73.05 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1010.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.18  COH = 1.86
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 69.38 (gm)  density = 2.45 (gm/cc)  viscosity = 6.28 (log 10 poise)  (analysis in wt %)
G = -1133531.90 (J)  H = -905135.16 (J)  S = 178.00 (J/K)  V = 28.32 (cc)  Cp = 92.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.06 | 0.72 | 14.40 | 0.61 | 0.00 | 2.66 | 0.01 | 0.49 | 0.00 | 0.00 | 2.03 | 3.55 | 2.87 | 0.14 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 7.77 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.88Mg1.00Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -106449.43 (J)  H = -84677.56 (J)  S = 16.97 (J/K)  V = 2.22 (cc)  Cp = 9.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.33 | 96.80 | 87.97 | 5.28 | -4.99 | 7.94 | 0.34 |

feldspar  mass = 17.72 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.04Na0.71Ca0.26Al1.26Si2.74O8
G = -295957.90 (J)  H = -242401.57 (J)  S = 41.74 (J/K)  V = 6.81 (cc)  Cp = 21.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.62 | 25.56 | 3.82 |

quartz  mass = 5.11 (gm)  density = 2.55 (gm/cc)
SiO2
G = -85367.21 (J)  H = -70770.57 (J)  S = 11.38 (J/K)  V = 2.00 (cc)  Cp = 6.07 (J/K)

Total solids  mass = 30.60 (gm)  density = 2.77 (gm/cc)
G = -487774.54 (J)  H = -397849.71 (J)  S = 70.08 (J/K)  V = 11.04 (cc)  Cp = 36.88 (J/K)

Viscosity of the System: 6.99 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.54 (gm/cc)
G = -1621306.44 (J)  H = -1302984.86 (J)  S = 248.08 (J/K)  V = 39.35 (cc)  Cp = 129.50 (J/K)

Oxygen  delta moles = -0.000777845  delta grams = -0.0248901

G = 226.45 (J)  H = -25.45 (J)  S = -0.20 (J/K)  V = -82.98 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 1000.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.17  COH = 1.84 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 64.72 (gm)  density = 2.45 (gm/cc)  viscosity = 6.30 (log 10 poise)  (analysis in wt %)
G = -1056491.06 (J)  H = -845355.26 (J)  S = 165.84 (J/K)  V = 26.45 (cc)  Cp = 86.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.98 | 0.77 | 14.43 | 0.60 | 0.00 | 2.58 | 0.02 | 0.45 | 0.00 | 0.00 | 1.97 | 3.46 | 3.04 | 0.16 | 1.55 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.30 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.98Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -112831.26 (J)  H = -89890.47 (J)  S = 18.02 (J/K)  V = 2.36 (cc)  Cp = 9.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.24 | 96.92 | 90.55 | 5.41 | -5.11 | 8.13 | 0.33 |

feldspar  mass = 20.39 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -339995.58 (J)  H = -279094.72 (J)  S = 47.83 (J/K)  V = 7.84 (cc)  Cp = 25.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.71 | 25.22 | 4.06 |

quartz  mass = 6.56 (gm)  density = 2.55 (gm/cc)
SiO2
G = -109466.45 (J)  H = -90947.90 (J)  S = 14.55 (J/K)  V = 2.57 (cc)  Cp = 7.79 (J/K)

Total solids  mass = 35.25 (gm)  density = 2.76 (gm/cc)
G = -562293.28 (J)  H = -459933.09 (J)  S = 80.40 (J/K)  V = 12.77 (cc)  Cp = 42.43 (J/K)

Viscosity of the System: 7.21 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.55 (gm/cc)
G = -1618784.35 (J)  H = -1305288.35 (J)  S = 246.24 (J/K)  V = 39.22 (cc)  Cp = 128.83 (J/K)

Oxygen  delta moles = -0.000871685  delta grams = -0.0278929
G = 251.57 (J)  H = -28.21 (J)  S = -0.22 (J/K)  V = -92.27 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 990.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.16  COH = 1.82  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 60.56 (gm)  density = 2.44 (gm/cc)  viscosity = 6.32 (log 10 poise)  (analysis in wt %)
G = -987665.00 (J)  H = -791926.56 (J)  S = 154.96 (J/K)  V = 24.79 (cc)  Cp = 80.84 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.89 0.82 14.47 0.58 0.00 2.48 0.02 0.42 0.00 0.00 1.92 3.38 3.20 0.17 1.66 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.78 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.95Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -118522.56 (J) H = -94580.76 (J) S = 18.95 (J/K) V = 2.49 (cc) Cp = 10.13 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-98.86 97.03 92.87 5.54 -5.21 8.31 0.32

feldspar mass = 22.78 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -379226.36 (J) H = -311996.56 (J) S = 53.22 (J/K) V = 8.76 (cc) Cp = 27.93 (J/K)
albite anorthite sanidine
70.78 24.92 4.31

quartz mass = 7.85 (gm) density = 2.55 (gm/cc)
SiO2
G = -130869.01 (J) H = -108967.31 (J) S = 17.34 (J/K) V = 3.07 (cc) Cp = 9.31 (J/K)

Total solids mass = 39.41 (gm) density = 2.75 (gm/cc)
G = -628617.93 (J) H = -515544.64 (J) S = 89.52 (J/K) V = 14.33 (cc) Cp = 47.38 (J/K)

Viscosity of the System: 7.46 (log 10 poise)

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1616282.92 (J) H = -1307471.19 (J) S = 244.48 (J/K) V = 39.11 (cc) Cp = 128.22 (J/K)

Oxygen delta moles = -0.000960673 delta grams = -0.0307404
G = 274.83 (J) H = -30.75 (J) S = -0.24 (J/K) V = -100.89 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 980.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.15 COH = 1.80 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 56.81 (gm) density = 2.44 (gm/cc) viscosity = 6.34 (log 10 poise) (analysis in wt %)
G = -925902.45 (J) H = -743956.72 (J) S = 145.19 (J/K) V = 23.29 (cc) Cp = 75.84 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.81 0.87 14.52 0.56 0.00 2.37 0.02 0.38 0.00 0.00 1.87 3.29 3.36 0.18 1.77 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.21 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.95Mg0.93Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -123587.96 (J) H = -98798.41 (J) S = 19.78 (J/K) V = 2.61 (cc) Cp = 10.60 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.21 97.14 94.95 5.66 -5.32 8.46 0.32

feldspar mass = 24.93 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.05Na0.71Ca0.25Al1.25Si2.75O8
G = -414317.83 (J) H = -341631.33 (J) S = 58.00 (J/K) V = 9.58 (cc) Cp = 30.53 (J/K)
albite anorthite sanidine
70.81 24.64 4.55

quartz mass = 9.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -149993.25 (J) H = -125163.18 (J) S = 19.81 (J/K) V = 3.53 (cc) Cp = 10.68 (J/K)

Total solids mass = 43.15 (gm) density = 2.75 (gm/cc)
G = -687899.04 (J) H = -565592.93 (J) S = 97.60 (J/K) V = 15.72 (cc) Cp = 51.81 (J/K)

Viscosity of the System: 7.76 (log 10 poise)

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1613801.49 (J) H = -1309549.65 (J) S = 242.79 (J/K) V = 39.01 (cc) Cp = 127.65 (J/K)

Oxygen delta moles = -0.00104465 delta grams = -0.0334275
G = 296.22 (J) H = -33.06 (J) S = -0.26 (J/K) V = -108.84 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 970.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.15 COH = 1.77 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 53.44 (gm) density = 2.44 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -870247.96 (J) H = -700705.71 (J) S = 136.38 (J/K) V = 21.93 (cc) Cp = 71.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.71 | 0.93 | 14.56 | 0.54 | 0.00 | 2.26 | 0.02 | 0.35 | 0.00 | 0.00 | 1.83 | 3.19 | 3.53 | 0.19 | 1.88 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.61 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.97Mg0.91Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -128085.96 (J) H = -102588.13 (J) S = 20.51 (J/K) V = 2.71 (cc) Cp = 11.02 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.30 97.24 96.79 5.78 -5.42 8.59 0.31

feldspar mass = 26.86 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -445825.33 (J) H = -368435.25 (J) S = 62.25 (J/K) V = 10.33 (cc) Cp = 32.87 (J/K)
albite anorthite sanidine
70.83 24.38 4.79

quartz mass = 10.06 (gm) density = 2.55 (gm/cc)
SiO2
G = -167180.14 (J) H = -139808.22 (J) S = 22.02 (J/K) V = 3.94 (cc) Cp = 11.91 (J/K)

Total solids mass = 46.53 (gm) density = 2.74 (gm/cc)
G = -741091.42 (J) H = -610831.60 (J) S = 104.78 (J/K) V = 16.98 (cc) Cp = 55.80 (J/K)

Viscosity of the System: 8.14 (log 10 poise)

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1611339.39 (J) H = -1311537.31 (J) S = 241.16 (J/K) V = 38.91 (cc) Cp = 127.14 (J/K)

Oxygen delta moles = -0.00112358 delta grams = -0.0359531
G = 315.78 (J) H = -35.16 (J) S = -0.28 (J/K) V = -116.13 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 50.38 (gm) density = 2.43 (gm/cc) viscosity = 6.37 (log 10 poise) (analysis in wt %)
G = -819899.72 (J) H = -661552.85 (J) S = 128.41 (J/K) V = 20.71 (cc) Cp = 67.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.62 | 0.98 | 14.61 | 0.52 | 0.00 | 2.15 | 0.02 | 0.33 | 0.00 | 0.00 | 1.79 | 3.10 | 3.69 | 0.20 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.96 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.98Mg0.90Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -132070.80 (J) H = -105990.99 (J) S = 21.15 (J/K) V = 2.81 (cc) Cp = 11.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.16 | 97.34 | 98.43 | 5.91 | -5.51 | 8.70 | 0.30 |

feldspar mass = 28.62 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -474215.46 (J) H = -392775.03 (J) S = 66.04 (J/K) V = 11.00 (cc) Cp = 34.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.82 | 24.15 | 5.03 |

quartz mass = 11.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -182710.02 (J) H = -153126.79 (J) S = 23.99 (J/K) V = 4.31 (cc) Cp = 13.02 (J/K)

Total solids mass = 49.58 (gm) density = 2.74 (gm/cc)
G = -788996.28 (J) H = -651892.81 (J) S = 111.18 (J/K) V = 18.11 (cc) Cp = 59.40 (J/K)

Viscosity of the System: 8.72 (log 10 poise)

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1608896.00 (J) H = -1313445.66 (J) S = 239.59 (J/K) V = 38.82 (cc) Cp = 126.66 (J/K)

Oxygen delta moles = -0.00119752 delta grams = -0.0383193
G = 333.56 (J) H = -37.04 (J) S = -0.30 (J/K) V = -122.78 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW

= 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 47.35 (gm) density = 2.43 (gm/cc) viscosity = 6.39 (log 10 poise) (analysis in wt %)
G = -770365.84 (J) H = -622906.43 (J) S = 120.56 (J/K) V = 19.50 (cc) Cp = 63.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.59 | 0.95 | 14.69 | 0.49 | 0.00 | 2.01 | 0.02 | 0.31 | 0.00 | 0.00 | 1.75 | 3.01 | 3.86 | 0.21 | 2.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.21 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.89Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -134868.40 (J) H = -108478.65 (J) S = 21.58 (J/K) V = 2.87 (cc) Cp = 11.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.42 | 97.42 | 99.56 | 5.99 | -5.61 | 8.77 | 0.30 |

feldspar mass = 30.32 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -501624.37 (J) H = -416406.44 (J) S = 69.67 (J/K) V = 11.65 (cc) Cp = 37.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.73 | 23.97 | 5.30 |

quartz mass = 11.98 (gm) density = 2.55 (gm/cc)
SiO2
G = -198577.25 (J) H = -166784.89 (J) S = 25.99 (J/K) V = 4.69 (cc) Cp = 14.16 (J/K)

rhm-oxide mass = 0.10 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.72Mg0.10Fe'"0.20Al0.14Ti0.83O3
G = -1045.84 (J) H = -797.14 (J) S = 0.20 (J/K) V = 0.02 (cc) Cp = 0.10 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.46 | 10.10 | 72.25 | 0.27 | 6.94 |

Total solids mass = 52.61 (gm) density = 2.73 (gm/cc)
G = -836115.86 (J) H = -692467.12 (J) S = 117.44 (J/K) V = 19.24 (cc) Cp = 62.94 (J/K)

Viscosity of the System: 10.71 (log 10 poise)

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1606481.69 (J) H = -1315373.56 (J) S = 238.00 (J/K) V = 38.74 (cc) Cp = 126.17 (J/K)

Oxygen delta moles = -0.0012467 delta grams = -0.0398928
G = 344.13 (J) H = -38.12 (J) S = -0.31 (J/K) V = -126.78 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 44.57 (gm) density = 2.42 (gm/cc) viscosity = 6.40 (log 10 poise) (analysis in wt %)
G = -724974.11 (J) H = -587443.79 (J) S = 113.37 (J/K) V = 18.40 (cc) Cp = 59.53 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.56 0.89 14.77 0.46 0.00 1.87 0.02 0.29 0.00 0.00 1.71 2.92 4.03 0.23 2.26 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.42 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.88Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -137149.82 (J) H = -110571.11 (J) S = 21.91 (J/K) V = 2.93 (cc) Cp = 11.88 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.46 97.50 100.49 6.07 -5.71 8.82 0.29

feldspar mass = 31.88 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -526601.42 (J) H = -438116.91 (J) S = 72.94 (J/K) V = 12.25 (cc) Cp = 38.89 (J/K)
albite anorthite sanidine
70.61 23.80 5.59

quartz mass = 12.88 (gm) density = 2.55 (gm/cc)
SiO2
G = -213225.88 (J) H = -179474.65 (J) S = 27.82 (J/K) V = 5.04 (cc) Cp = 15.21 (J/K)

rhm-oxide mass = 0.21 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe'"0.20Al0.14Ti0.83O3
G = -2135.11 (J) H = -1632.40 (J) S = 0.41 (J/K) V = 0.05 (cc) Cp = 0.21 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.27 9.98 72.62 0.28 6.85

Total solids mass = 55.39 (gm) density = 2.73 (gm/cc)
G = -879112.23 (J) H = -729795.06 (J) S = 123.08 (J/K) V = 20.27 (cc) Cp = 66.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1604086.34 (J) H = -1317238.85 (J) S = 236.45 (J/K) V = 38.66 (cc) Cp = 125.71 (J/K)

Oxygen delta moles = -0.00128995 delta grams = -0.0412769
G = 352.83 (J) H = -38.98 (J) S = -0.32 (J/K) V = -130.11 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 42.05 (gm) density = 2.42 (gm/cc) viscosity = 6.42 (log 10 poise) (analysis in wt %)
G = -683848.52 (J) H = -555282.92 (J) S = 106.86 (J/K) V = 17.40 (cc) Cp = 56.19 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.51 0.85 14.85 0.43 0.00 1.74 0.02 0.27 0.00 0.00 1.68 2.83 4.20 0.24 2.39 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.61 (gm) density = 3.56 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.01Mg0.87Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -139111.36 (J) H = -112420.12 (J) S = 22.18 (J/K) V = 2.98 (cc) Cp = 12.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.37 | 97.57 | 101.30 | 6.15 | -5.80 | 8.86 | 0.29 |

feldspar mass = 33.29 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.70Ca0.24Al1.24Si2.76O8
G = -549161.69 (J) H = -457905.45 (J) S = 75.85 (J/K) V = 12.79 (cc) Cp = 40.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.49 | 23.64 | 5.88 |

quartz mass = 13.70 (gm) density = 2.55 (gm/cc)
SiO2
G = -226511.43 (J) H = -191067.52 (J) S = 29.46 (J/K) V = 5.36 (cc) Cp = 16.17 (J/K)

rhm-oxide mass = 0.31 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe'"0.20Al0.14Ti0.83O3
G = -3074.17 (J) H = -2357.70 (J) S = 0.60 (J/K) V = 0.07 (cc) Cp = 0.30 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.10 | 9.85 | 73.00 | 0.30 | 6.76 |

Total solids mass = 57.91 (gm) density = 2.73 (gm/cc)
G = -917858.66 (J) H = -763750.79 (J) S = 128.09 (J/K) V = 21.20 (cc) Cp = 69.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1601707.18 (J) H = -1319033.72 (J) S = 234.94 (J/K) V = 38.59 (cc) Cp = 125.29 (J/K)

Oxygen delta moles = -0.00133153 delta grams = -0.0426072
G = 360.87 (J) H = -39.76 (J) S = -0.33 (J/K) V = -133.20 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 39.76 (gm) density = 2.41 (gm/cc) viscosity = 6.43 (log 10 poise) (analysis in wt %)
G = -646390.51 (J) H = -525959.05 (J) S = 100.94 (J/K) V = 16.48 (cc) Cp = 53.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.45 | 0.80 | 14.93 | 0.41 | 0.00 | 1.61 | 0.02 | 0.25 | 0.00 | 0.00 | 1.64 | 2.75 | 4.36 | 0.25 | 2.53 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.77 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.02Mg0.86Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -140795.77 (J) H = -114057.86 (J) S = 22.41 (J/K) V = 3.02 (cc) Cp = 12.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.18 | 97.64 | 102.01 | 6.24 | -5.90 | 8.90 | 0.28 |

feldspar mass = 34.59 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -569638.88 (J) H = -476037.45 (J) S = 78.45 (J/K) V = 13.29 (cc) Cp = 42.11 (J/K)
albite anorthite sanidine
70.35 23.48 6.17

quartz mass = 14.45 (gm) density = 2.55 (gm/cc)
SiO2
G = -238630.89 (J) H = -201722.56 (J) S = 30.93 (J/K) V = 5.66 (cc) Cp = 17.04 (J/K)

rhm-oxide mass = 0.39 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe'"0.19Al0.13Ti0.84O3
G = -3887.73 (J) H = -2991.05 (J) S = 0.75 (J/K) V = 0.08 (cc) Cp = 0.37 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.94 9.70 73.36 0.32 6.68

Total solids mass = 60.20 (gm) density = 2.73 (gm/cc)
G = -952953.27 (J) H = -794808.92 (J) S = 132.54 (J/K) V = 22.05 (cc) Cp = 71.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1599343.78 (J) H = -1320767.97 (J) S = 233.48 (J/K) V = 38.53 (cc) Cp = 124.90 (J/K)

Oxygen delta moles = -0.00137144 delta grams = -0.0438846
G = 368.26 (J) H = -40.46 (J) S = -0.34 (J/K) V = -136.05 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 37.66 (gm) density = 2.41 (gm/cc) viscosity = 6.44 (log 10 poise) (analysis in wt %)
G = -612102.23 (J) H = -499085.55 (J) S = 95.52 (J/K) V = 15.64 (cc) Cp = 50.36 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.37 0.75 15.02 0.38 0.00 1.49 0.02 0.24 0.00 0.00 1.61 2.66 4.52 0.27 2.67 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.91 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.86Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -142240.37 (J) H = -115512.40 (J) S = 22.59 (J/K) V = 3.05 (cc) Cp = 12.38 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-109.89 97.72 102.63 6.33 -6.00 8.94 0.27

feldspar mass = 35.78 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -588310.97 (J) H = -492734.06 (J) S = 80.78 (J/K) V = 13.74 (cc) Cp = 43.51 (J/K)
albite anorthite sanidine
70.20 23.34 6.46

quartz mass = 15.14 (gm) density = 2.55 (gm/cc)

SiO2
G = -249746.55 (J)  H = -211570.86 (J)  S = 32.27 (J/K)  V = 5.93 (cc)  Cp = 17.84 (J/K)

rhm-oxide  mass = 0.46 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.00Fe"0.74Mg0.10Fe'''0.19Al0.13Ti0.84O3
G = -4595.65 (J)  H = -3546.92 (J)  S = 0.89 (J/K)  V = 0.10 (cc)  Cp = 0.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.80 | 9.54 | 73.73 | 0.33 | 6.60 |

Total solids  mass = 62.29 (gm)  density = 2.73 (gm/cc)
G = -984893.53 (J)  H = -823364.25 (J)  S = 136.52 (J/K)  V = 22.83 (cc)  Cp = 74.17 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.60 (gm/cc)
G = -1596995.76 (J)  H = -1322449.80 (J)  S = 232.05 (J/K)  V = 38.47 (cc)  Cp = 124.53 (J/K)

Oxygen  delta moles = -0.00140975  delta grams = -0.0451103
G = 375.03 (J)  H = -41.09 (J)  S = -0.35 (J/K)  V = -138.68 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 900.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = 0.09  COH = 1.60  IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid  mass = 35.73 (gm)  density = 2.40 (gm/cc)  viscosity = 6.44 (log 10 poise)  (analysis in wt %)
G = -580566.25 (J)  H = -474338.08 (J)  S = 90.55 (J/K)  V = 14.87 (cc)  Cp = 47.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.27 | 0.71 | 15.11 | 0.36 | 0.00 | 1.38 | 0.03 | 0.22 | 0.00 | 0.00 | 1.58 | 2.57 | 4.68 | 0.28 | 2.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.04 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.85Fe'''0.03Ti0.00Al0.16Si1.91O6
G = -143477.69 (J)  H = -116808.26 (J)  S = 22.73 (J/K)  V = 3.09 (cc)  Cp = 12.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.52 | 97.79 | 103.18 | 6.42 | -6.11 | 8.98 | 0.27 |

feldspar  mass = 36.87 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -605411.52 (J)  H = -508181.21 (J)  S = 82.88 (J/K)  V = 14.16 (cc)  Cp = 44.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.05 | 23.20 | 6.75 |

quartz  mass = 15.78 (gm)  density = 2.55 (gm/cc)
SiO2
G = -259993.29 (J)  H = -220721.45 (J)  S = 33.48 (J/K)  V = 6.18 (cc)  Cp = 18.58 (J/K)

rhm-oxide  mass = 0.53 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.00Fe"0.74Mg0.10Fe'''0.19Al0.13Ti0.84O3
G = -5214.03 (J)  H = -4037.04 (J)  S = 1.00 (J/K)  V = 0.11 (cc)  Cp = 0.50 (J/K)

geikielite hematite ilmenite pyrophanite corundum
9.67 9.37 74.08 0.35 6.53

Total solids mass = 64.22 (gm) density = 2.73 (gm/cc)
G = -1014096.52 (J) H = -849747.96 (J) S = 140.09 (J/K) V = 23.54 (cc) Cp = 76.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1594662.78 (J) H = -1324086.04 (J) S = 230.64 (J/K) V = 38.41 (cc) Cp = 124.19 (J/K)

Oxygen delta moles = -0.00144649 delta grams = -0.046286
G = 381.20 (J) H = -41.65 (J) S = -0.36 (J/K) V = -141.09 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 33.96 (gm) density = 2.40 (gm/cc) viscosity = 6.44 (log 10 poise) (analysis in wt %)
G = -551429.86 (J) H = -451442.43 (J) S = 85.96 (J/K) V = 14.15 (cc) Cp = 45.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.16 | 0.67 | 15.21 | 0.33 | 0.00 | 1.28 | 0.03 | 0.21 | 0.00 | 0.00 | 1.55 | 2.48 | 4.83 | 0.30 | 2.96 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.14 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.85Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -144536.02 (J) H = -117966.78 (J) S = 22.84 (J/K) V = 3.11 (cc) Cp = 12.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.08 | 97.86 | 103.65 | 6.51 | -6.21 | 9.01 | 0.26 |

feldspar mass = 37.89 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -621138.41 (J) H = -522536.50 (J) S = 84.77 (J/K) V = 14.55 (cc) Cp = 46.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.88 | 23.07 | 7.05 |

quartz mass = 16.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -269484.24 (J) H = -229265.76 (J) S = 34.58 (J/K) V = 6.41 (cc) Cp = 19.26 (J/K)

rhm-oxide mass = 0.58 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.74Mg0.10Fe'"0.18Al0.13Ti0.84O3
G = -5756.03 (J) H = -4471.00 (J) S = 1.10 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.55 | 9.19 | 74.44 | 0.37 | 6.46 |

Total solids mass = 66.00 (gm) density = 2.73 (gm/cc)
G = -1040914.70 (J) H = -874240.04 (J) S = 143.30 (J/K) V = 24.20 (cc) Cp = 78.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1592344.56 (J) H = -1325682.48 (J) S = 229.26 (J/K) V = 38.36 (cc) Cp = 123.86 (J/K)

Oxygen delta moles = -0.00148173 delta grams = -0.0474135
G = 386.79 (J) H = -42.14 (J) S = -0.37 (J/K) V = -143.29 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 880.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.07 COH = 1.54 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 32.30 (gm) density = 2.40 (gm/cc) viscosity = 6.44 (log 10 poise) (analysis in wt %)
G = -524392.70 (J) H = -430164.90 (J) S = 81.71 (J/K) V = 13.49 (cc) Cp = 43.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.03 | 0.63 | 15.30 | 0.31 | 0.00 | 1.18 | 0.03 | 0.20 | 0.00 | 0.00 | 1.52 | 2.40 | 4.98 | 0.31 | 3.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.24 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.84Fe"'0.03Ti0.00Al0.16Si1.91O6
G = -145439.99 (J) H = -119006.55 (J) S = 22.92 (J/K) V = 3.14 (cc) Cp = 12.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.58 | 97.93 | 104.07 | 6.61 | -6.32 | 9.05 | 0.26 |

feldspar mass = 38.83 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -635660.65 (J) H = -535934.69 (J) S = 86.48 (J/K) V = 14.91 (cc) Cp = 47.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.71 | 22.94 | 7.35 |

quartz mass = 16.94 (gm) density = 2.55 (gm/cc)
SiO2
G = -278315.01 (J) H = -237281.18 (J) S = 35.58 (J/K) V = 6.63 (cc) Cp = 19.90 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.75Mg0.09Fe"'0.18Al0.13Ti0.85O3
G = -6232.52 (J) H = -4856.68 (J) S = 1.19 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.43 | 9.01 | 74.78 | 0.39 | 6.39 |

Total solids mass = 67.65 (gm) density = 2.73 (gm/cc)
G = -1065648.17 (J) H = -897079.11 (J) S = 146.18 (J/K) V = 24.82 (cc) Cp = 80.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1590040.88 (J) H = -1327244.01 (J) S = 227.89 (J/K) V = 38.30 (cc) Cp = 123.56 (J/K)

Oxygen delta moles = -0.00151552 delta grams = -0.0484947

G = 391.85 (J)  H = -42.56 (J)  S = -0.38 (J/K)  V = -145.30 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 870.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.45  delta HM = -5.07  NNO = 0.00  QFM = 0.07  COH = 1.51  IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid  mass = 30.77 (gm)  density = 2.39 (gm/cc)  viscosity = 6.44 (log 10 poise)  (analysis in wt %)
G = -499197.10 (J)  H = -410304.74 (J)  S = 77.76 (J/K)  V = 12.87 (cc)  Cp = 41.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.88 | 0.60 | 15.40 | 0.29 | 0.00 | 1.09 | 0.03 | 0.19 | 0.00 | 0.00 | 1.50 | 2.32 | 5.12 | 0.33 | 3.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.33 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.84Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -146210.99 (J)  H = -119943.78 (J)  S = 22.98 (J/K)  V = 3.16 (cc)  Cp = 12.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.04 | 98.00 | 104.43 | 6.71 | -6.43 | 9.08 | 0.25 |

feldspar  mass = 39.72 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.70Ca0.23Al1.23Si2.77O8
G = -649123.79 (J)  H = -548491.95 (J)  S = 88.03 (J/K)  V = 15.25 (cc)  Cp = 48.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.52 | 22.82 | 7.66 |

quartz  mass = 17.46 (gm)  density = 2.55 (gm/cc)
SiO2
G = -286567.15 (J)  H = -244833.74 (J)  S = 36.51 (J/K)  V = 6.84 (cc)  Cp = 20.50 (J/K)

rhm-oxide  mass = 0.68 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.00Fe"0.75Mg0.09Fe'"0.18Al0.13Ti0.85O3
G = -6652.48 (J)  H = -5200.64 (J)  S = 1.27 (J/K)  V = 0.15 (cc)  Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.32 | 8.82 | 75.13 | 0.41 | 6.33 |

Total solids  mass = 69.18 (gm)  density = 2.72 (gm/cc)
G = -1088554.41 (J)  H = -918470.10 (J)  S = 148.79 (J/K)  V = 25.39 (cc)  Cp = 82.05 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.61 (gm/cc)
G = -1587751.50 (J)  H = -1328774.84 (J)  S = 226.55 (J/K)  V = 38.26 (cc)  Cp = 123.27 (J/K)

Oxygen  delta moles = -0.00154792  delta grams = -0.0495315
G = 396.38 (J)  H = -42.92 (J)  S = -0.38 (J/K)  V = -147.12 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 860.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.64  delta HM = -5.08  NNO = 0.00  QFM = 0.06  COH = 1.48  IW

= 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 29.33 (gm) density = 2.39 (gm/cc) viscosity = 6.43 (log 10 poise) (analysis in wt %)
G = -475620.21 (J) H = -391688.07 (J) S = 74.07 (J/K) V = 12.28 (cc) Cp = 39.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.72 | 0.56 | 15.50 | 0.27 | 0.00 | 1.00 | 0.03 | 0.18 | 0.00 | 0.00 | 1.48 | 2.23 | 5.25 | 0.34 | 3.43 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.40 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.84Fe"'0.03Ti0.00Al0.16Si1.91O6
G = -146867.63 (J) H = -120792.60 (J) S = 23.01 (J/K) V = 3.18 (cc) Cp = 12.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.45 | 98.06 | 104.75 | 6.82 | -6.55 | 9.13 | 0.24 |

feldspar mass = 40.55 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -661654.23 (J) H = -560309.31 (J) S = 89.44 (J/K) V = 15.56 (cc) Cp = 49.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.33 | 22.70 | 7.97 |

quartz mass = 17.96 (gm) density = 2.55 (gm/cc)
SiO2
G = -294310.77 (J) H = -251980.26 (J) S = 37.36 (J/K) V = 7.03 (cc) Cp = 21.06 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.75Mg0.09Fe"'0.17Al0.13Ti0.85O3
G = -7023.43 (J) H = -5508.33 (J) S = 1.34 (J/K) V = 0.15 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.22 | 8.62 | 75.47 | 0.42 | 6.27 |

Total solids mass = 70.62 (gm) density = 2.72 (gm/cc)
G = -1109856.06 (J) H = -938590.50 (J) S = 151.14 (J/K) V = 25.93 (cc) Cp = 83.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1585476.27 (J) H = -1330278.57 (J) S = 225.21 (J/K) V = 38.21 (cc) Cp = 123.00 (J/K)

Oxygen delta moles = -0.001579 delta grams = -0.050526
G = 400.42 (J) H = -43.23 (J) S = -0.39 (J/K) V = -148.76 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 850.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.05 COH = 1.46 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 27.98 (gm) density = 2.38 (gm/cc) viscosity = 6.42 (log 10 poise) (analysis in wt %)
G = -453467.76 (J) H = -374162.99 (J) S = 70.61 (J/K) V = 11.73 (cc) Cp = 37.54 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.53 0.53 15.61 0.25 0.00 0.92 0.03 0.17 0.00 0.00 1.46 2.15 5.39 0.36 3.59 0.00 0.00 0.00 0.00

orthopyroxene mass = 11.47 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.84Fe'"0.02Ti0.00Al0.16Si1.91O6
G = -147426.15 (J) H = -121565.36 (J) S = 23.03 (J/K) V = 3.19 (cc) Cp = 12.91 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-112.83 98.13 105.03 6.94 -6.68 9.17 0.24

feldspar mass = 41.33 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -673362.74 (J) H = -571475.49 (J) S = 90.72 (J/K) V = 15.86 (cc) Cp = 50.01 (J/K)
albite anorthite sanidine
69.12 22.59 8.29

quartz mass = 18.43 (gm) density = 2.55 (gm/cc)
SiO2
G = -301606.67 (J) H = -258770.12 (J) S = 38.14 (J/K) V = 7.22 (cc) Cp = 21.58 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.76Mg0.09Fe'"0.17Al0.12Ti0.85O3
G = -7351.70 (J) H = -5784.36 (J) S = 1.40 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.11 8.43 75.80 0.44 6.21

Total solids mass = 71.97 (gm) density = 2.72 (gm/cc)
G = -1129747.27 (J) H = -957595.34 (J) S = 153.28 (J/K) V = 26.43 (cc) Cp = 85.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1583215.04 (J) H = -1331758.33 (J) S = 223.89 (J/K) V = 38.17 (cc) Cp = 122.75 (J/K)

Oxygen delta moles = -0.00160882 delta grams = -0.0514802
G = 403.99 (J) H = -43.47 (J) S = -0.40 (J/K) V = -150.23 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 26.59 (gm) density = 2.38 (gm/cc) viscosity = 6.38 (log 10 poise) (analysis in wt %)
G = -430701.44 (J) H = -355997.14 (J) S = 67.11 (J/K) V = 11.17 (cc) Cp = 35.70 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.42 0.50 15.56 0.24 0.00 0.84 0.03 0.16 0.00 0.00 1.46 2.12 5.51 0.38 3.78 0.00 0.00 0.00 0.00

garnet mass = 0.73 (gm) density = 3.97 (gm/cc) (analysis in mole %)

(Ca0.11Fe"0.63Mg0.26)3Al2Si3O12
G = -9753.63 (J) H = -8174.12 (J) S = 1.42 (J/K) V = 0.18 (cc) Cp = 0.79 (J/K)
almandine grossular pyrope
63.28 11.14 25.58

orthopyroxene mass = 10.99 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.85Fe'"0.02Ti0.00Al0.16Si1.91O6
G = -141436.20 (J) H = -116974.96 (J) S = 21.97 (J/K) V = 3.06 (cc) Cp = 12.38 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-111.75 98.13 104.24 6.81 -6.56 8.89 0.24

feldspar mass = 41.86 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -680990.85 (J) H = -579194.80 (J) S = 91.45 (J/K) V = 16.07 (cc) Cp = 50.63 (J/K)
albite anorthite sanidine
69.03 22.22 8.74

quartz mass = 18.99 (gm) density = 2.55 (gm/cc)
SiO2
G = -310431.99 (J) H = -266900.69 (J) S = 39.11 (J/K) V = 7.44 (cc) Cp = 22.22 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.76Mg0.09Fe'"0.16Al0.12Ti0.86O3
G = -7638.83 (J) H = -6030.47 (J) S = 1.44 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.19 8.16 76.13 0.47 6.06

Total solids mass = 73.36 (gm) density = 2.73 (gm/cc)
G = -1150251.51 (J) H = -977275.04 (J) S = 155.39 (J/K) V = 26.92 (cc) Cp = 86.75 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1580952.95 (J) H = -1333272.18 (J) S = 222.50 (J/K) V = 38.09 (cc) Cp = 122.45 (J/K)

Oxygen delta moles = -0.00166574 delta grams = -0.0533017
G = 414.17 (J) H = -44.42 (J) S = -0.41 (J/K) V = -154.17 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 25.19 (gm) density = 2.37 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -407829.92 (J) H = -337629.36 (J) S = 63.64 (J/K) V = 10.61 (cc) Cp = 33.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.34 | 0.47 | 15.42 | 0.22 | 0.00 | 0.75 | 0.03 | 0.16 | 0.00 | 0.00 | 1.47 | 2.13 | 5.63 | 0.40 | 3.99 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.89 (gm) density = 3.97 (gm/cc) (analysis in mole %)

(Ca0.11Fe"0.63Mg0.26)3Al2Si3O12
G = -25180.28 (J) H = -21158.14 (J) S = 3.65 (J/K) V = 0.48 (cc) Cp = 2.03 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.83 | 11.49 | 25.68 |

orthopyroxene mass = 10.21 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.87Fe'"0.02Ti0.00Al0.15Si1.91O6
G = -131678.66 (J) H = -109260.60 (J) S = 20.32 (J/K) V = 2.85 (cc) Cp = 11.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.62 | 98.08 | 102.68 | 6.51 | -6.28 | 8.39 | 0.24 |

feldspar mass = 42.24 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -686070.39 (J) H = -584756.23 (J) S = 91.84 (J/K) V = 16.22 (cc) Cp = 51.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.00 | 21.70 | 9.30 |

quartz mass = 19.60 (gm) density = 2.55 (gm/cc)
SiO2
G = -320049.00 (J) H = -275744.57 (J) S = 40.16 (J/K) V = 7.68 (cc) Cp = 22.91 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.76Mg0.09Fe'"0.16Al0.12Ti0.86O3
G = -7890.36 (J) H = -6250.55 (J) S = 1.49 (J/K) V = 0.17 (cc) Cp = 0.76 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.40 | 7.83 | 76.43 | 0.50 | 5.84 |

Total solids mass = 74.75 (gm) density = 2.73 (gm/cc)
G = -1170868.70 (J) H = -997170.09 (J) S = 157.46 (J/K) V = 27.39 (cc) Cp = 88.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1578698.62 (J) H = -1334799.46 (J) S = 221.09 (J/K) V = 38.00 (cc) Cp = 122.13 (J/K)

Oxygen delta moles = -0.00173478 delta grams = -0.055511
G = 427.04 (J) H = -45.65 (J) S = -0.43 (J/K) V = -159.11 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 820.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.02 COH = 1.37 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 23.86 (gm) density = 2.37 (gm/cc) viscosity = 6.25 (log 10 poise) (analysis in wt %)
G = -385939.65 (J) H = -319997.72 (J) S = 60.32 (J/K) V = 10.07 (cc) Cp = 32.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.24 | 0.44 | 15.28 | 0.20 | 0.00 | 0.68 | 0.03 | 0.16 | 0.00 | 0.00 | 1.48 | 2.14 | 5.73 | 0.42 | 4.21 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.96 (gm) density = 3.97 (gm/cc) (analysis in mole %)

(Ca0.12Fe"0.62Mg0.26)3Al2Si3O12
G = -39546.95 (J) H = -33317.48 (J) S = 5.70 (J/K) V = 0.75 (cc) Cp = 3.19 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.35 | 11.85 | 25.80 |

orthopyroxene mass = 9.48 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.01Mg0.89Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -122641.63 (J) H = -102094.57 (J) S = 18.80 (J/K) V = 2.65 (cc) Cp = 10.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.43 | 98.03 | 101.03 | 6.22 | -6.00 | 7.91 | 0.24 |

feldspar mass = 42.62 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -691032.51 (J) H = -590235.50 (J) S = 92.21 (J/K) V = 16.36 (cc) Cp = 51.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.93 | 21.17 | 9.90 |

quartz mass = 20.19 (gm) density = 2.55 (gm/cc)
SiO2
G = -329188.25 (J) H = -284209.94 (J) S = 41.15 (J/K) V = 7.90 (cc) Cp = 23.57 (J/K)

rhm-oxide mass = 0.83 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.10Fe'"0.15Al0.11Ti0.87O3
G = -8113.48 (J) H = -6449.47 (J) S = 1.52 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.62 | 7.51 | 76.70 | 0.53 | 5.64 |

Total solids mass = 76.08 (gm) density = 2.73 (gm/cc)
G = -1190522.81 (J) H = -1016306.96 (J) S = 159.37 (J/K) V = 27.85 (cc) Cp = 89.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1576462.46 (J) H = -1336304.68 (J) S = 219.69 (J/K) V = 37.92 (cc) Cp = 121.84 (J/K)

Oxygen delta moles = -0.00179608 delta grams = -0.0574725
G = 437.70 (J) H = -46.63 (J) S = -0.44 (J/K) V = -163.24 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 22.51 (gm) density = 2.36 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -363882.06 (J) H = -302134.50 (J) S = 57.01 (J/K) V = 9.53 (cc) Cp = 30.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.10 | 0.41 | 15.14 | 0.18 | 0.00 | 0.61 | 0.03 | 0.15 | 0.00 | 0.00 | 1.50 | 2.16 | 5.80 | 0.45 | 4.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.99 (gm) density = 3.96 (gm/cc) (analysis in mole %)

(Ca0.12Fe"0.62Mg0.26)3Al2Si3O12
G = -53229.23 (J) H = -44962.70 (J) S = 7.63 (J/K) V = 1.01 (cc) Cp = 4.29 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.84 | 12.21 | 25.95 |

orthopyroxene mass = 8.79 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.99Mg0.91Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -114075.70 (J) H = -95275.46 (J) S = 17.36 (J/K) V = 2.47 (cc) Cp = 9.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.12 | 97.97 | 99.25 | 5.94 | -5.73 | 7.44 | 0.24 |

feldspar mass = 42.86 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -693838.74 (J) H = -593893.86 (J) S = 92.27 (J/K) V = 16.46 (cc) Cp = 51.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.89 | 20.69 | 10.42 |

feldspar mass = 0.17 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -2682.72 (J) H = -2291.18 (J) S = 0.36 (J/K) V = 0.07 (cc) Cp = 0.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.76 | 2.21 | 65.03 |

quartz mass = 20.77 (gm) density = 2.55 (gm/cc)
SiO2
G = -338213.06 (J) H = -292608.48 (J) S = 42.10 (J/K) V = 8.13 (cc) Cp = 24.22 (J/K)

rhm-oxide mass = 0.85 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.10Fe'"0.14Al0.11Ti0.87O3
G = -8322.23 (J) H = -6638.32 (J) S = 1.55 (J/K) V = 0.18 (cc) Cp = 0.80 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.85 | 7.19 | 76.94 | 0.56 | 5.45 |

Total solids mass = 77.44 (gm) density = 2.73 (gm/cc)
G = -1210361.68 (J) H = -1035669.99 (J) S = 161.28 (J/K) V = 28.31 (cc) Cp = 91.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1574243.73 (J) H = -1337804.49 (J) S = 218.29 (J/K) V = 37.84 (cc) Cp = 121.56 (J/K)

Oxygen delta moles = -0.00185086 delta grams = -0.0592252
G = 446.49 (J) H = -47.40 (J) S = -0.46 (J/K) V = -166.68 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 20.72 (gm) density = 2.35 (gm/cc) viscosity = 5.99 (log 10 poise) (analysis in wt %)
G = -335133.28 (J) H = -278492.14 (J) S = 52.78 (J/K) V = 8.80 (cc) Cp = 27.96 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.90 0.38 14.97 0.17 0.00 0.56 0.04 0.16 0.00 0.00 1.54 2.29 5.66 0.49 4.85 0.00 0.00 0.00 0.00

garnet mass = 5.06 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.61Mg0.26)3Al2Si3O12
G = -67550.54 (J) H = -57211.08 (J) S = 9.63 (J/K) V = 1.28 (cc) Cp = 5.44 (J/K)
almandine grossular pyrope
61.25 12.49 26.26

orthopyroxene mass = 8.06 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.97Mg0.93Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -105034.95 (J) H = -88021.23 (J) S = 15.85 (J/K) V = 2.27 (cc) Cp = 9.14 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.48 97.92 97.12 5.67 -5.47 7.00 0.24

feldspar mass = 42.04 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -679717.09 (J) H = -583099.06 (J) S = 90.03 (J/K) V = 16.14 (cc) Cp = 50.84 (J/K)
albite anorthite sanidine
69.33 20.66 10.01

feldspar mass = 1.72 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -26933.57 (J) H = -23054.23 (J) S = 3.61 (J/K) V = 0.68 (cc) Cp = 2.03 (J/K)
albite anorthite sanidine
32.08 2.06 65.87

quartz mass = 21.46 (gm) density = 2.55 (gm/cc)
SiO2
G = -349090.72 (J) H = -302645.01 (J) S = 43.28 (J/K) V = 8.40 (cc) Cp = 25.00 (J/K)

rhm-oxide mass = 0.88 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.10Fe'"0.14Al0.11Ti0.88O3
G = -8581.92 (J) H = -6869.77 (J) S = 1.60 (J/K) V = 0.19 (cc) Cp = 0.82 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.15 6.85 77.11 0.59 5.29

Total solids mass = 79.22 (gm) density = 2.74 (gm/cc)
G = -1236908.80 (J) H = -1060900.38 (J) S = 164.01 (J/K) V = 28.95 (cc) Cp = 93.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1572042.08 (J) H = -1339392.52 (J) S = 216.79 (J/K) V = 37.75 (cc) Cp = 121.24 (J/K)

Oxygen delta moles = -0.00190094 delta grams = -0.0608277
G = 453.89 (J) H = -48.02 (J) S = -0.47 (J/K) V = -169.61 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27

IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 19.05 (gm) density = 2.35 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -308231.76 (J) H = -256309.09 (J) S = 48.84 (J/K) V = 8.12 (cc) Cp = 25.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.64 | 0.34 | 14.81 | 0.16 | 0.00 | 0.52 | 0.04 | 0.16 | 0.00 | 0.00 | 1.58 | 2.43 | 5.52 | 0.53 | 5.28 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.04 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.13Fe"0.61Mg0.27)3Al2Si3O12
G = -80678.90 (J) H = -68509.86 (J) S = 11.45 (J/K) V = 1.53 (cc) Cp = 6.49 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.66 | 12.76 | 26.58 |

orthopyroxene mass = 7.40 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.95Mg0.96Fe'"0.01Ti0.00Al0.12Si1.93O6
G = -96798.03 (J) H = -81390.24 (J) S = 14.49 (J/K) V = 2.09 (cc) Cp = 8.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.85 | 97.87 | 94.96 | 5.41 | -5.22 | 6.58 | 0.25 |

feldspar mass = 41.30 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.21Al1.21Si2.79O8
G = -667091.44 (J) H = -573535.02 (J) S = 88.00 (J/K) V = 15.85 (cc) Cp = 50.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.77 | 20.60 | 9.62 |

feldspar mass = 3.12 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -48860.88 (J) H = -41916.86 (J) S = 6.53 (J/K) V = 1.23 (cc) Cp = 3.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.40 | 1.91 | 66.69 |

quartz mass = 22.12 (gm) density = 2.55 (gm/cc)
SiO2
G = -359396.63 (J) H = -312223.04 (J) S = 44.37 (J/K) V = 8.66 (cc) Cp = 25.74 (J/K)

rhm-oxide mass = 0.90 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.10Fe'"0.13Al0.10Ti0.88O3
G = -8801.04 (J) H = -7070.02 (J) S = 1.63 (J/K) V = 0.20 (cc) Cp = 0.84 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.46 | 6.51 | 77.26 | 0.62 | 5.15 |

Total solids mass = 80.89 (gm) density = 2.74 (gm/cc)
G = -1261626.92 (J) H = -1084645.04 (J) S = 166.47 (J/K) V = 29.55 (cc) Cp = 95.17 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1569858.68 (J) H = -1340954.13 (J) S = 215.31 (J/K) V = 37.67 (cc) Cp = 120.96 (J/K)

Oxygen delta moles = -0.00194469 delta grams = -0.0622277

G = 459.55 (J)  H = -48.44 (J)  S = -0.48 (J/K)  V = -171.90 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 780.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = -0.02  COH = 1.24  IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 17.47 (gm)  density = 2.34 (gm/cc)  viscosity = 5.59 (log 10 poise)  (analysis in wt %)
G = -282809.67 (J)  H = -235282.98 (J)  S = 45.13 (J/K)  V = 7.48 (cc)  Cp = 23.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.30 | 0.31 | 14.65 | 0.16 | 0.00 | 0.48 | 0.04 | 0.16 | 0.00 | 0.00 | 1.64 | 2.58 | 5.35 | 0.58 | 5.75 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 6.94 (gm)  density = 3.95 (gm/cc)  (analysis in mole %)
(Ca0.13Fe"0.60Mg0.27)3Al2Si3O12
G = -92805.56 (J)  H = -79013.58 (J)  S = 13.10 (J/K)  V = 1.75 (cc)  Cp = 7.46 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.08 | 13.02 | 26.91 |

orthopyroxene  mass = 6.80 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.93Mg0.99Fe'"0.01Ti0.00Al0.12Si1.94O6
G = -89234.97 (J)  H = -75280.12 (J)  S = 13.25 (J/K)  V = 1.92 (cc)  Cp = 7.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.22 | 97.82 | 92.79 | 5.16 | -4.98 | 6.18 | 0.25 |

feldspar  mass = 40.65 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -655737.68 (J)  H = -565017.59 (J)  S = 86.14 (J/K)  V = 15.59 (cc)  Cp = 49.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.22 | 20.53 | 9.25 |

feldspar  mass = 4.40 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.68Na0.31Ca0.02Al1.02Si2.98O8
G = -68848.03 (J)  H = -59195.36 (J)  S = 9.17 (J/K)  V = 1.73 (cc)  Cp = 5.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.73 | 1.77 | 67.50 |

quartz  mass = 22.76 (gm)  density = 2.55 (gm/cc)
SiO2
G = -369271.11 (J)  H = -321461.56 (J)  S = 45.40 (J/K)  V = 8.91 (cc)  Cp = 26.45 (J/K)

rhm-oxide  mass = 0.92 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.77Mg0.11Fe'"0.12Al0.10Ti0.89O3
G = -8985.85 (J)  H = -7243.79 (J)  S = 1.65 (J/K)  V = 0.20 (cc)  Cp = 0.86 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.77 | 6.20 | 77.38 | 0.65 | 5.01 |

Total solids  mass = 82.47 (gm)  density = 2.74 (gm/cc)
G = -1284883.20 (J)  H = -1107212.01 (J)  S = 168.70 (J/K)  V = 30.11 (cc)  Cp = 96.99 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1567692.87 (J) H = -1342494.99 (J) S = 213.83 (J/K) V = 37.59 (cc) Cp = 120.72 (J/K)

Oxygen delta moles = -0.00198313 delta grams = -0.0634577
G = 463.77 (J) H = -48.70 (J) S = -0.49 (J/K) V = -173.65 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 14.82 (gm) density = 2.32 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -240055.00 (J) H = -199593.84 (J) S = 38.79 (J/K) V = 6.39 (cc) Cp = 20.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.94 | 0.25 | 14.04 | 0.17 | 0.00 | 0.51 | 0.05 | 0.15 | 0.00 | 0.00 | 1.77 | 2.98 | 5.06 | 0.68 | 6.41 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.30 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.61Mg0.25)3Al2Si3O12
G = -123799.22 (J) H = -105614.69 (J) S = 17.43 (J/K) V = 2.35 (cc) Cp = 9.97 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.02 | 13.72 | 25.25 |

orthopyroxene mass = 4.20 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.96Mg0.96Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -54714.27 (J) H = -46230.04 (J) S = 8.13 (J/K) V = 1.18 (cc) Cp = 4.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.84 | 97.85 | 95.62 | 4.93 | -4.76 | 5.97 | 0.25 |

biotite mass = 1.28 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -20243.61 (J) H = -17352.22 (J) S = 2.77 (J/K) V = 0.46 (cc) Cp = 1.61 (J/K)

| annite | phlogopite |
|---|---|
| 4.30 | 95.70 |

feldspar mass = 39.98 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.71Ca0.20Al1.20Si2.80O8
G = -644144.73 (J) H = -556202.90 (J) S = 84.30 (J/K) V = 15.34 (cc) Cp = 48.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.19 | 19.69 | 9.12 |

feldspar mass = 4.92 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.02Al1.02Si2.98O8
G = -76770.49 (J) H = -66152.82 (J) S = 10.18 (J/K) V = 1.94 (cc) Cp = 5.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.60 | 1.63 | 67.77 |

quartz mass = 24.47 (gm) density = 2.55 (gm/cc)

SiO2
G = -396561.08 (J)  H = -345926.27 (J)  S = 48.54 (J/K)  V = 9.58 (cc)  Cp = 28.41 (J/K)

rhm-oxide  mass = 0.96 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.78Mg0.10Fe'"0.13Al0.09Ti0.89O3
G = -9259.38 (J)  H = -7480.03 (J)  S = 1.71 (J/K)  V = 0.21 (cc)  Cp = 0.88 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.14 | 6.31 | 78.24 | 0.67 | 4.65 |

Total solids  mass = 85.11 (gm)  density = 2.74 (gm/cc)
G = -1325492.79 (J)  H = -1144958.98 (J)  S = 173.07 (J/K)  V = 31.06 (cc)  Cp = 100.05 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.67 (gm/cc)
G = -1565547.79 (J)  H = -1344552.81 (J)  S = 211.85 (J/K)  V = 37.45 (cc)  Cp = 120.29 (J/K)

Oxygen  delta moles = -0.00201331  delta grams = -0.0644234
G = 465.89 (J)  H = -48.74 (J)  S = -0.49 (J/K)  V = -174.62 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 760.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -14.77  delta HM = -5.17  NNO = 0.00  QFM = -0.04  COH = 1.17  IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid  mass = 12.15 (gm)  density = 2.30 (gm/cc)  viscosity = 4.78 (log 10 poise)  (analysis in wt %)
G = -196879.48 (J)  H = -163450.67 (J)  S = 32.36 (J/K)  V = 5.28 (cc)  Cp = 16.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.40 | 0.20 | 13.18 | 0.20 | 0.00 | 0.56 | 0.06 | 0.13 | 0.00 | 0.00 | 1.97 | 3.58 | 4.65 | 0.83 | 7.25 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 12.03 (gm)  density = 3.98 (gm/cc)  (analysis in mole %)
(Ca0.15Fe"0.63Mg0.23)3Al2Si3O12
G = -158904.78 (J)  H = -135807.13 (J)  S = 22.36 (J/K)  V = 3.03 (cc)  Cp = 12.82 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.61 | 14.58 | 22.81 |

orthopyroxene  mass = 1.11 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.01Mg0.91Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -14290.48 (J)  H = -12083.71 (J)  S = 2.14 (J/K)  V = 0.31 (cc)  Cp = 1.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.92 | 97.91 | 100.80 | 4.69 | -4.56 | 5.84 | 0.24 |

biotite  mass = 2.91 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -45857.19 (J)  H = -39370.60 (J)  S = 6.28 (J/K)  V = 1.05 (cc)  Cp = 3.66 (J/K)

| annite | phlogopite |
|---|---|
| 5.69 | 94.31 |

feldspar  mass = 39.30 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.09Na0.72Ca0.18Al1.18Si2.82O8
G = -632350.25 (J) H = -547149.60 (J) S = 82.47 (J/K) V = 15.09 (cc) Cp = 47.99 (J/K)
albite anorthite sanidine
72.43 18.44 9.13

feldspar mass = 5.02 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -78299.59 (J) H = -67618.42 (J) S = 10.34 (J/K) V = 1.98 (cc) Cp = 5.94 (J/K)
albite anorthite sanidine
30.76 1.48 67.76

quartz mass = 26.41 (gm) density = 2.55 (gm/cc)
SiO2
G = -427369.04 (J) H = -373562.43 (J) S = 52.08 (J/K) V = 10.34 (cc) Cp = 30.61 (J/K)

rhm-oxide mass = 0.99 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.79Mg0.09Fe'"0.13Al0.08Ti0.89O3
G = -9475.43 (J) H = -7666.47 (J) S = 1.75 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.11 6.62 79.35 0.69 4.22

Total solids mass = 87.78 (gm) density = 2.74 (gm/cc)
G = -1366546.75 (J) H = -1183258.36 (J) S = 177.41 (J/K) V = 32.01 (cc) Cp = 103.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.68 (gm/cc)
G = -1563426.24 (J) H = -1346709.03 (J) S = 209.76 (J/K) V = 37.29 (cc) Cp = 119.89 (J/K)

Oxygen delta moles = -0.00203941 delta grams = -0.0652587
G = 466.93 (J) H = -48.66 (J) S = -0.50 (J/K) V = -175.18 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 10.50 (gm) density = 2.29 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -170240.43 (J) H = -141179.63 (J) S = 28.40 (J/K) V = 4.59 (cc) Cp = 14.54 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.50 0.16 12.91 0.21 0.00 0.57 0.06 0.11 0.00 0.00 2.10 3.95 4.35 0.96 8.12 0.00 0.00 0.00 0.00

garnet mass = 12.96 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.64Mg0.21)3Al2Si3O12
G = -170288.99 (J) H = -145827.86 (J) S = 23.91 (J/K) V = 3.25 (cc) Cp = 13.77 (J/K)
almandine grossular pyrope
63.61 14.96 21.44

biotite mass = 3.59 (gm) density = 2.78 (gm/cc) (analysis in mole %)

K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -56296.73 (J) H = -48424.45 (J) S = 7.69 (J/K) V = 1.29 (cc) Cp = 4.50 (J/K)

| annite | phlogopite |
|---|---|
| 6.54 | 93.46 |

feldspar mass = 39.04 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.73Ca0.18Al1.18Si2.82O8
G = -627435.17 (J) H = -544072.59 (J) S = 81.48 (J/K) V = 14.99 (cc) Cp = 47.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.09 | 18.05 | 8.85 |

feldspar mass = 5.46 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -84968.07 (J) H = -73539.55 (J) S = 11.17 (J/K) V = 2.15 (cc) Cp = 6.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.25 | 1.36 | 68.39 |

quartz mass = 27.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -442535.74 (J) H = -387607.39 (J) S = 53.69 (J/K) V = 10.72 (cc) Cp = 31.70 (J/K)

rhm-oxide mass = 1.00 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.80Mg0.09Fe"'0.13Al0.08Ti0.89O3
G = -9560.30 (J) H = -7755.16 (J) S = 1.76 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.53 | 6.53 | 80.16 | 0.70 | 4.08 |

Total solids mass = 89.44 (gm) density = 2.74 (gm/cc)
G = -1391085.01 (J) H = -1207227.00 (J) S = 179.70 (J/K) V = 32.62 (cc) Cp = 105.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1561325.43 (J) H = -1348406.63 (J) S = 208.10 (J/K) V = 37.21 (cc) Cp = 119.80 (J/K)

Oxygen delta moles = -0.00206271 delta grams = -0.0660044
G = 467.23 (J) H = -48.49 (J) S = -0.50 (J/K) V = -175.47 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 9.30 (gm) density = 2.27 (gm/cc) viscosity = 4.05 (log 10 poise) (analysis in wt %)
G = -151162.78 (J) H = -125222.48 (J) S = 25.60 (J/K) V = 4.10 (cc) Cp = 13.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.23 | 0.14 | 13.08 | 0.20 | 0.00 | 0.54 | 0.07 | 0.10 | 0.00 | 0.00 | 2.21 | 4.14 | 4.11 | 1.08 | 9.10 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.85 (gm) density = 3.99 (gm/cc) (analysis in mole %)

(Ca0.15Fe"0.64Mg0.21)3Al2Si3O12
G = -168220.98 (J) H = -144360.56 (J) S = 23.55 (J/K) V = 3.22 (cc) Cp = 13.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.26 | 15.00 | 20.74 |

biotite mass = 3.73 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -58309.40 (J) H = -50264.96 (J) S = 7.94 (J/K) V = 1.34 (cc) Cp = 4.66 (J/K)

| annite | phlogopite |
|---|---|
| 6.79 | 93.21 |

feldspar mass = 39.07 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.73Ca0.18Al1.18Si2.82O8
G = -627158.66 (J) H = -545044.63 (J) S = 81.05 (J/K) V = 14.99 (cc) Cp = 48.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.33 | 18.27 | 8.40 |

feldspar mass = 6.14 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -95339.39 (J) H = -82699.39 (J) S = 12.48 (J/K) V = 2.42 (cc) Cp = 7.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.30 | 1.26 | 69.44 |

quartz mass = 27.84 (gm) density = 2.55 (gm/cc)
SiO2
G = -449454.36 (J) H = -394466.13 (J) S = 54.27 (J/K) V = 10.90 (cc) Cp = 32.19 (J/K)

rhm-oxide mass = 1.01 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.81Mg0.08Fe'"0.12Al0.08Ti0.90O3
G = -9595.01 (J) H = -7808.45 (J) S = 1.76 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.20 | 6.16 | 80.81 | 0.70 | 4.13 |

Total solids mass = 90.63 (gm) density = 2.74 (gm/cc)
G = -1408077.80 (J) H = -1224644.12 (J) S = 181.05 (J/K) V = 33.09 (cc) Cp = 106.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1559240.58 (J) H = -1349866.60 (J) S = 206.66 (J/K) V = 37.18 (cc) Cp = 119.95 (J/K)

Oxygen delta moles = -0.00208393 delta grams = -0.0666834
G = 466.94 (J) H = -48.26 (J) S = -0.51 (J/K) V = -175.54 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 730.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.07 COH = 1.06
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 8.06 (gm) density = 2.25 (gm/cc) viscosity = 3.58 (log 10 poise) (analysis in wt %)
G = -131468.23 (J) H = -108655.30 (J) S = 22.74 (J/K) V = 3.59 (cc) Cp = 11.41 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.46 0.11 13.28 0.20 0.00 0.52 0.08 0.09 0.00 0.00 2.37 4.41 3.80 1.25 10.44 0.00 0.00 0.00 0.00

garnet mass = 12.76 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.65Mg0.20)3Al2Si3O12
G = -166418.96 (J) H = -143116.96 (J) S = 23.23 (J/K) V = 3.19 (cc) Cp = 13.48 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.86 | 14.99 | 20.15 |

biotite mass = 3.84 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -59936.05 (J) H = -51782.24 (J) S = 8.13 (J/K) V = 1.38 (cc) Cp = 4.79 (J/K)

| annite | phlogopite |
|---|---|
| 6.91 | 93.09 |

feldspar mass = 39.11 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.19Al1.19Si2.81O8
G = -627184.35 (J) H = -546281.41 (J) S = 80.65 (J/K) V = 15.00 (cc) Cp = 48.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.54 | 18.50 | 7.96 |

feldspar mass = 6.82 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.28Ca0.01Al1.01Si2.99O8
G = -105798.84 (J) H = -91975.90 (J) S = 13.78 (J/K) V = 2.69 (cc) Cp = 8.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.35 | 1.17 | 70.48 |

quartz mass = 28.32 (gm) density = 2.55 (gm/cc)
SiO2
G = -456740.84 (J) H = -401671.68 (J) S = 54.90 (J/K) V = 11.09 (cc) Cp = 32.71 (J/K)

rhm-oxide mass = 1.01 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.81Mg0.08Fe'"0.12Al0.08Ti0.90O3
G = -9623.33 (J) H = -7857.10 (J) S = 1.76 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.92 | 5.78 | 81.40 | 0.70 | 4.19 |

Total solids mass = 91.87 (gm) density = 2.74 (gm/cc)
G = -1425702.37 (J) H = -1242685.27 (J) S = 182.44 (J/K) V = 33.56 (cc) Cp = 108.82 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1557170.60 (J) H = -1351340.57 (J) S = 205.18 (J/K) V = 37.15 (cc) Cp = 120.24 (J/K)

Oxygen delta moles = -0.00210461 delta grams = -0.0673451
G = 466.45 (J) H = -48.01 (J) S = -0.51 (J/K) V = -175.54 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 720.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = -0.09 COH = 1.03

IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 6.70 (gm) density = 2.21 (gm/cc) viscosity = 2.92 (log 10 poise) (analysis in wt %)
G = -109827.48 (J) H = -90332.62 (J) S = 19.63 (J/K) V = 3.03 (cc) Cp = 9.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.67 | 0.08 | 13.51 | 0.20 | 0.00 | 0.51 | 0.10 | 0.08 | 0.00 | 0.00 | 2.62 | 4.86 | 3.35 | 1.50 | 12.51 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.69 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.65Mg0.20)3Al2Si3O12
G = -164955.28 (J) H = -142160.21 (J) S = 22.95 (J/K) V = 3.17 (cc) Cp = 13.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.41 | 14.87 | 19.71 |

biotite mass = 3.92 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -61070.25 (J) H = -52883.30 (J) S = 8.24 (J/K) V = 1.41 (cc) Cp = 4.88 (J/K)

| annite | phlogopite |
|---|---|
| 6.88 | 93.12 |

feldspar mass = 39.19 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.19Al1.19Si2.81O8
G = -627768.51 (J) H = -548010.77 (J) S = 80.31 (J/K) V = 15.02 (cc) Cp = 49.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.71 | 18.76 | 7.53 |

feldspar mass = 7.55 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -116905.19 (J) H = -101856.54 (J) S = 15.15 (J/K) V = 2.97 (cc) Cp = 9.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.41 | 1.08 | 71.51 |

quartz mass = 28.87 (gm) density = 2.55 (gm/cc)
SiO2
G = -464940.17 (J) H = -409706.09 (J) S = 55.62 (J/K) V = 11.30 (cc) Cp = 33.29 (J/K)

rhm-oxide mass = 1.02 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.82Mg0.08Fe'"0.11Al0.09Ti0.90O3
G = -9648.72 (J) H = -7904.07 (J) S = 1.76 (J/K) V = 0.22 (cc) Cp = 0.93 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.70 | 5.39 | 81.94 | 0.68 | 4.29 |

Total solids mass = 93.23 (gm) density = 2.73 (gm/cc)
G = -1445288.11 (J) H = -1262520.98 (J) S = 184.03 (J/K) V = 34.09 (cc) Cp = 111.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1555115.60 (J) H = -1352853.61 (J) S = 203.66 (J/K) V = 37.12 (cc) Cp = 120.70 (J/K)

Oxygen delta moles = -0.0021253 delta grams = -0.068007

G = 465.85 (J)  H = -47.74 (J)  S = -0.52 (J/K)  V = -175.49 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 710.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -16.00  delta HM = -5.22  NNO = 0.00  QFM = -0.10  COH = 0.99
IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid  mass = 3.33 (gm)  density = 2.17 (gm/cc)  viscosity = 1.91 (log 10 poise)  (analysis in wt %)
G = -54874.65 (J)  H = -44810.83 (J)  S = 10.24 (J/K)  V = 1.53 (cc)  Cp = 5.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.35 | 0.06 | 13.82 | 0.18 | 0.00 | 0.45 | 0.18 | 0.07 | 0.00 | 0.00 | 4.41 | 5.01 | 2.81 | 3.02 | 15.62 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 12.98 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.15Fe"0.65Mg0.20)3Al2Si3O12
G = -168897.63 (J)  H = -145935.12 (J)  S = 23.36 (J/K)  V = 3.25 (cc)  Cp = 13.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.80 | 15.46 | 19.74 |

biotite  mass = 3.81 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -59575.14 (J)  H = -51731.69 (J)  S = 7.98 (J/K)  V = 1.37 (cc)  Cp = 4.75 (J/K)

| annite | phlogopite |
|---|---|
| 5.79 | 94.21 |

feldspar  mass = 34.53 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.07Na0.72Ca0.21Al1.21Si2.79O8
G = -552758.70 (J)  H = -483705.21 (J)  S = 70.24 (J/K)  V = 13.20 (cc)  Cp = 44.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.28 | 21.07 | 6.65 |

feldspar  mass = 9.34 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.74Na0.25Ca0.01Al1.01Si2.99O8
G = -144174.61 (J)  H = -125899.81 (J)  S = 18.59 (J/K)  V = 3.67 (cc)  Cp = 11.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 25.27 | 1.04 | 73.69 |

quartz  mass = 30.75 (gm)  density = 2.59 (gm/cc)
SiO2
G = -494756.05 (J)  H = -437534.75 (J)  S = 58.20 (J/K)  V = 11.88 (cc)  Cp = 41.12 (J/K)

leucite  mass = 4.17 (gm)  density = 2.27 (gm/cc)  (analysis in mole %)
K0.01Na0.99AlSi2O5.06(OH)1.88
G = -68331.94 (J)  H = -58064.39 (J)  S = 10.44 (J/K)  V = 1.84 (cc)  Cp = 6.45 (J/K)

| leucite | analcime | na-leucite |
|---|---|---|
| 0.51 | 94.19 | 5.29 |

rhm-oxide  mass = 1.02 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.82Mg0.08Fe'"0.09Al0.09Ti0.91O3
G = -9697.02 (J)  H = -7975.42 (J)  S = 1.75 (J/K)  V = 0.22 (cc)  Cp = 0.93 (J/K)

geikielite hematite ilmenite pyrophanite corundum
7.85 4.73 81.97 0.84 4.60

Total solids mass = 96.60 (gm) density = 2.73 (gm/cc)
G = -1498191.09 (J) H = -1310846.39 (J) S = 190.56 (J/K) V = 35.43 (cc) Cp = 122.35 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1553065.74 (J) H = -1355657.22 (J) S = 200.79 (J/K) V = 36.96 (cc) Cp = 127.35 (J/K)

Oxygen delta moles = -0.00216953 delta grams = -0.0694224
G = 470.28 (J) H = -47.98 (J) S = -0.53 (J/K) V = -177.34 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: f8p2

T = 700.00 (C) P = 6.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = -0.11 COH = 0.95 IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 1.35 (gm) density = 2.13 (gm/cc) viscosity = 0.77 (log 10 poise) (analysis in wt %)
G = -22372.98 (J) H = -18114.05 (J) S = 4.38 (J/K) V = 0.63 (cc) Cp = 2.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45.14 | 0.04 | 13.78 | 0.17 | 0.00 | 0.38 | 0.36 | 0.06 | 0.00 | 0.00 | 7.56 | 5.00 | 2.21 | 5.74 | 19.57 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.23 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.64Mg0.20)3Al2Si3O12
G = -172110.82 (J) H = -149085.26 (J) S = 23.66 (J/K) V = 3.31 (cc) Cp = 13.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.29 | 15.66 | 20.05 |

biotite mass = 3.68 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -57630.24 (J) H = -50179.61 (J) S = 7.66 (J/K) V = 1.33 (cc) Cp = 4.59 (J/K)

| annite | phlogopite |
|---|---|
| 4.74 | 95.26 |

feldspar mass = 30.80 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -492821.24 (J) H = -432306.87 (J) S = 62.18 (J/K) V = 11.75 (cc) Cp = 40.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.64 | 23.48 | 5.88 |

feldspar mass = 10.34 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.76Na0.23Ca0.01Al1.01Si2.99O8
G = -159198.95 (J) H = -139333.32 (J) S = 20.41 (J/K) V = 4.06 (cc) Cp = 12.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 23.28 | 1.00 | 75.72 |

quartz mass = 31.97 (gm) density = 2.59 (gm/cc)

SiO2
G = -513651.35 (J)  H = -455203.27 (J)  S = 60.06 (J/K)  V = 12.33 (cc)  Cp = 42.37 (J/K)

leucite  mass = 7.50 (gm)  density = 2.27 (gm/cc)  (analysis in mole %)
K0.00Na1.00AlSi2O5.05(OH)1.89
G = -122760.23 (J)  H = -104585.79 (J)  S = 18.68 (J/K)  V = 3.30 (cc)  Cp = 11.58 (J/K)

| leucite | analcime | na-leucite |
|---|---|---|
| 0.47 | 94.59 | 4.94 |

rhm-oxide  mass = 1.02 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.82Mg0.08Fe'"0.08Al0.10Ti0.91O3
G = -9726.15 (J)  H = -8031.70 (J)  S = 1.74 (J/K)  V = 0.22 (cc)  Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.07 | 4.14 | 81.68 | 1.08 | 5.03 |

apatite  mass = 0.05 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -778.93 (J)  H = -677.20 (J)  S = 0.10 (J/K)  V = 0.02 (cc)  Cp = 0.06 (J/K)

Total solids  mass = 98.58 (gm)  density = 2.71 (gm/cc)
G = -1528677.90 (J)  H = -1339403.03 (J)  S = 194.50 (J/K)  V = 36.32 (cc)  Cp = 125.83 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.70 (gm/cc)
G = -1551050.88 (J)  H = -1357517.07 (J)  S = 198.87 (J/K)  V = 36.96 (cc)

**********----------**********
Title: f8p2

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.07 (log 10 poise)  (analysis in wt %)
G = -1695246.08 (J)  H = -1251897.81 (J)  S = 281.82 (J/K)  V = 40.57 (cc)  Cp = 143.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.78 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.07 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1695246.08 (J)  H = -1251897.81 (J)  S = 281.82 (J/K)  V = 40.57 (cc)  Cp = 143.23 (J/K)

Oxygen  delta moles = 1.73472e-17  delta grams = 5.55091e-16
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.13 (log 10 poise)  (analysis in wt %)
G = -1692433.71 (J)  H = -1253331.16 (J)  S = 280.91 (J/K)  V = 40.54 (cc)  Cp = 143.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.78 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1692433.71 (J)  H = -1253331.16 (J)  S = 280.91 (J/K)  V = 40.54 (cc)  Cp = 143.22 (J/K)

Oxygen  delta moles = 2.38655e-06  delta grams = 7.63666e-05
G = -0.87 (J)  H = 0.10 (J)  S = 0.00 (J/K)  V = 0.31 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.19 (log 10 poise)  (analysis in wt %)
G = -1689630.67 (J)  H = -1254764.57 (J)  S = 279.99 (J/K)  V = 40.51 (cc)  Cp = 143.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.78 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.19 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1689630.67 (J)  H = -1254764.57 (J)  S = 279.99 (J/K)  V = 40.51 (cc)  Cp = 143.21 (J/K)

Oxygen  delta moles = 5.07493e-06  delta grams = 0.000162392
G = -1.83 (J)  H = 0.22 (J)  S = 0.00 (J/K)  V = 0.66 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -1686837.02 (J)  H = -1256198.04 (J)  S = 279.06 (J/K)  V = 40.48 (cc)  Cp = 143.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.78 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1686837.02 (J)  H = -1256198.04 (J)  S = 279.06 (J/K)  V = 40.48 (cc)  Cp = 143.21 (J/K)

Oxygen  delta moles = 8.07362e-06  delta grams = 0.000258346
G = -2.89 (J)  H = 0.34 (J)  S = 0.00 (J/K)  V = 1.04 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1684052.81 (J)  H = -1257631.58 (J)  S = 278.13 (J/K)  V = 40.45 (cc)  Cp = 143.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.78 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1684052.81 (J)  H = -1257631.58 (J)  S = 278.13 (J/K)  V = 40.45 (cc)  Cp = 143.20 (J/K)

Oxygen  delta moles = 1.13914e-05  delta grams = 0.000364512
G = -4.04 (J)  H = 0.48 (J)  S = 0.00 (J/K)  V = 1.45 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1681278.12 (J)  H = -1259065.20 (J)  S = 277.20 (J/K)  V = 40.42 (cc)  Cp = 143.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.77 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1681278.12 (J)  H = -1259065.20 (J)  S = 277.20 (J/K)  V = 40.42 (cc)  Cp = 143.19 (J/K)

Oxygen  delta moles = 1.50375e-05  delta grams = 0.000481183
G = -5.30 (J)  H = 0.62 (J)  S = 0.00 (J/K)  V = 1.90 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1240.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.24  COH = 2.19  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.43 (log 10 poise) (analysis in wt %)
G = -1678513.01 (J) H = -1260498.90 (J) S = 276.25 (J/K) V = 40.39 (cc) Cp = 143.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.77 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1678513.01 (J) H = -1260498.90 (J) S = 276.25 (J/K) V = 40.39 (cc) Cp = 143.18 (J/K)

Oxygen delta moles = 1.90215e-05 delta grams = 0.000608666
G = -6.66 (J) H = 0.78 (J) S = 0.00 (J/K) V = 2.39 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.49 (log 10 poise) (analysis in wt %)
G = -1675757.55 (J) H = -1261932.69 (J) S = 275.31 (J/K) V = 40.36 (cc) Cp = 143.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.77 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.49 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1675757.55 (J) H = -1261932.69 (J) S = 275.31 (J/K) V = 40.36 (cc) Cp = 143.17 (J/K)

Oxygen delta moles = 2.33534e-05 delta grams = 0.00074728
G = -8.11 (J) H = 0.95 (J) S = 0.01 (J/K) V = 2.92 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.55 (log 10 poise) (analysis in wt %)
G = -1673011.79 (J) H = -1263366.58 (J) S = 274.35 (J/K) V = 40.33 (cc) Cp = 143.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.73 | 0.00 | 3.77 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.55 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1673011.79 (J) H = -1263366.58 (J) S = 274.35 (J/K) V = 40.33 (cc) Cp = 143.17 (J/K)

Oxygen delta moles = 2.80436e-05 delta grams = 0.00089736
G = -9.67 (J) H = 1.13 (J) S = 0.01 (J/K) V = 3.48 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1670275.82 (J) H = -1264800.57 (J) S = 273.39 (J/K) V = 40.30 (cc) Cp = 143.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.74 | 0.00 | 3.77 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1670275.82 (J) H = -1264800.57 (J) S = 273.39 (J/K) V = 40.30 (cc) Cp = 143.16 (J/K)

Oxygen delta moles = 3.31029e-05 delta grams = 0.00105925
G = -11.33 (J) H = 1.32 (J) S = 0.01 (J/K) V = 4.08 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1200.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.12 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1667549.58 (J) H = -1266182.40 (J) S = 272.46 (J/K) V = 40.27 (cc) Cp = 135.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.74 | 0.00 | 3.77 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1667549.58 (J) H = -1266182.40 (J) S = 272.46 (J/K) V = 40.27 (cc) Cp = 135.51 (J/K)

Oxygen delta moles = 3.85429e-05 delta grams = 0.00123333
G = -13.09 (J) H = 1.53 (J) S = 0.01 (J/K) V = 4.72 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1664832.77 (J) H = -1267540.15 (J) S = 271.53 (J/K) V = 40.25 (cc) Cp = 135.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.74 | 0.00 | 3.77 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1664832.77 (J) H = -1267540.15 (J) S = 271.53 (J/K) V = 40.25 (cc) Cp = 135.49 (J/K)

Oxygen delta moles = 4.43752e-05 delta grams = 0.00141995
G = -14.95 (J) H = 1.74 (J) S = 0.01 (J/K) V = 5.40 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.81 (log 10 poise) (analysis in wt %)
G = -1662125.43 (J) H = -1268897.83 (J) S = 270.60 (J/K) V = 40.22 (cc) Cp = 135.46 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.74 0.00 3.76 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.81 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1662125.43 (J) H = -1268897.83 (J) S = 270.60 (J/K) V = 40.22 (cc) Cp = 135.46 (J/K)

Oxygen delta moles = 5.06124e-05 delta grams = 0.00161954
G = -16.93 (J) H = 1.97 (J) S = 0.01 (J/K) V = 6.11 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1659427.63 (J) H = -1270255.45 (J) S = 269.67 (J/K) V = 40.19 (cc) Cp = 135.43 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.74 0.00 3.76 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1659427.63 (J) H = -1270255.45 (J) S = 269.67 (J/K) V = 40.19 (cc) Cp = 135.43 (J/K)

Oxygen delta moles = 5.72675e-05 delta grams = 0.00183249
G = -19.00 (J) H = 2.21 (J) S = 0.01 (J/K) V = 6.87 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1160.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.05 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 99.31 (gm) density = 2.49 (gm/cc) viscosity = 4.99 (log 10 poise) (analysis in wt %)
G = -1646185.57 (J) H = -1263682.59 (J) S = 266.90 (J/K) V = 39.92 (cc) Cp = 134.33 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

69.36 0.51 14.56 0.73 0.00 3.68 0.01 1.54 0.00 0.00 2.42 3.95 2.13 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.69 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.53Mg1.37Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -10531.47 (J) H = -8183.69 (J) S = 1.64 (J/K) V = 0.21 (cc) Cp = 0.85 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-56.78 97.01 53.27 4.01 -3.78 5.96 0.32

Total solids mass = 0.69 (gm) density = 3.33 (gm/cc)
G = -10531.47 (J) H = -8183.69 (J) S = 1.64 (J/K) V = 0.21 (cc) Cp = 0.85 (J/K)

Viscosity of the System: 5.00 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1656717.03 (J) H = -1271866.28 (J) S = 268.53 (J/K) V = 40.13 (cc) Cp = 135.18 (J/K)

Oxygen delta moles = 2.11226e-05 delta grams = 0.000675897
G = -6.96 (J) H = 0.81 (J) S = 0.01 (J/K) V = 2.52 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1150.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.03 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 98.83 (gm) density = 2.49 (gm/cc) viscosity = 5.08 (log 10 poise) (analysis in wt %)
G = -1636382.03 (J) H = -1259661.83 (J) S = 264.71 (J/K) V = 39.73 (cc) Cp = 133.57 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.44 0.51 14.62 0.72 0.00 3.61 0.01 1.44 0.00 0.00 2.43 3.97 2.14 0.10 1.02 0.00 0.00 0.00 0.00

orthopyroxene mass = 1.17 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.55Mg1.35Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -17640.83 (J) H = -13730.51 (J) S = 2.75 (J/K) V = 0.35 (cc) Cp = 1.43 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-58.73 96.88 55.19 4.12 -3.89 6.10 0.33

Total solids mass = 1.17 (gm) density = 3.34 (gm/cc)
G = -17640.83 (J) H = -13730.51 (J) S = 2.75 (J/K) V = 0.35 (cc) Cp = 1.43 (J/K)

Viscosity of the System: 5.10 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1654022.86 (J) H = -1273392.34 (J) S = 267.46 (J/K) V = 40.08 (cc) Cp = 135.00 (J/K)

Oxygen delta moles = -4.55592e-06 delta grams = -0.000145784
G = 1.49 (J) H = -0.17 (J) S = -0.00 (J/K) V = -0.54 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1140.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.18  COH = 2.01  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.37 (gm)  density = 2.49 (gm/cc)  viscosity = 5.18 (log 10 poise)  (analysis in wt %)
G = -1626823.89 (J)  H = -1255799.32 (J)  S = 262.55 (J/K)  V = 39.54 (cc)  Cp = 132.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.53 | 0.51 | 14.67 | 0.71 | 0.00 | 3.54 | 0.01 | 1.33 | 0.00 | 0.00 | 2.44 | 3.98 | 2.15 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.63 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.33Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -24514.54 (J)  H = -19111.47 (J)  S = 3.82 (J/K)  V = 0.49 (cc)  Cp = 1.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.73 | 96.75 | 57.17 | 4.23 | -4.01 | 6.25 | 0.35 |

Total solids  mass = 1.63 (gm)  density = 3.35 (gm/cc)
G = -24514.54 (J)  H = -19111.47 (J)  S = 3.82 (J/K)  V = 0.49 (cc)  Cp = 1.99 (J/K)

Viscosity of the System: 5.20 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1651338.43 (J)  H = -1274910.79 (J)  S = 266.37 (J/K)  V = 40.03 (cc)  Cp = 134.82 (J/K)

Oxygen  delta moles = -3.21923e-05  delta grams = -0.00103011
G = 10.44 (J)  H = -1.20 (J)  S = -0.01 (J/K)  V = -3.78 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1130.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.17  COH = 1.99  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.91 (gm)  density = 2.49 (gm/cc)  viscosity = 5.28 (log 10 poise)  (analysis in wt %)
G = -1617492.70 (J)  H = -1252082.17 (J)  S = 260.42 (J/K)  V = 39.36 (cc)  Cp = 132.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.61 | 0.51 | 14.73 | 0.70 | 0.00 | 3.47 | 0.01 | 1.24 | 0.00 | 0.00 | 2.45 | 4.00 | 2.16 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.09 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.59Mg1.31Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -31171.02 (J)  H = -24340.01 (J)  S = 4.87 (J/K)  V = 0.62 (cc)  Cp = 2.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.78 | 96.61 | 59.18 | 4.35 | -4.13 | 6.40 | 0.36 |

Total solids  mass = 2.09 (gm)  density = 3.36 (gm/cc)
G = -31171.02 (J)  H = -24340.01 (J)  S = 4.87 (J/K)  V = 0.62 (cc)  Cp = 2.54 (J/K)

Viscosity of the System: 5.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1648663.72 (J) H = -1276422.18 (J) S = 265.29 (J/K) V = 39.98 (cc) Cp = 134.65 (J/K)

Oxygen delta moles = -6.18946e-05 delta grams = -0.00198055
G = 19.91 (J) H = -2.29 (J) S = -0.02 (J/K) V = -7.22 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 97.46 (gm) density = 2.49 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1608371.98 (J) H = -1248498.75 (J) S = 258.32 (J/K) V = 39.18 (cc) Cp = 131.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.69 | 0.51 | 14.78 | 0.69 | 0.00 | 3.39 | 0.01 | 1.15 | 0.00 | 0.00 | 2.45 | 4.02 | 2.17 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.54 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.61Mg1.28Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -37626.73 (J) H = -29428.21 (J) S = 5.88 (J/K) V = 0.75 (cc) Cp = 3.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.87 | 96.48 | 61.23 | 4.48 | -4.25 | 6.56 | 0.37 |

Total solids mass = 2.54 (gm) density = 3.37 (gm/cc)
G = -37626.73 (J) H = -29428.21 (J) S = 5.88 (J/K) V = 0.75 (cc) Cp = 3.07 (J/K)

Viscosity of the System: 5.41 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1645998.71 (J) H = -1277926.96 (J) S = 264.20 (J/K) V = 39.93 (cc) Cp = 134.48 (J/K)

Oxygen delta moles = -9.37576e-05 delta grams = -0.00300013
G = 29.91 (J) H = -3.44 (J) S = -0.02 (J/K) V = -10.86 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1110.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.16 COH = 1.95 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 97.02 (gm) density = 2.49 (gm/cc) viscosity = 5.48 (log 10 poise) (analysis in wt %)
G = -1599447.31 (J) H = -1245038.82 (J) S = 256.23 (J/K) V = 39.01 (cc) Cp = 130.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.78 | 0.52 | 14.84 | 0.68 | 0.00 | 3.30 | 0.01 | 1.06 | 0.00 | 0.00 | 2.46 | 4.04 | 2.18 | 0.10 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.98 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.63Mg1.26Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -43896.10 (J) H = -34386.71 (J) S = 6.88 (J/K) V = 0.88 (cc) Cp = 3.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.00 | 96.34 | 63.31 | 4.62 | -4.39 | 6.74 | 0.39 |

Total solids mass = 2.98 (gm) density = 3.38 (gm/cc)
G = -43896.10 (J) H = -34386.71 (J) S = 6.88 (J/K) V = 0.88 (cc) Cp = 3.60 (J/K)

Viscosity of the System: 5.52 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1643343.41 (J) H = -1279425.53 (J) S = 263.11 (J/K) V = 39.89 (cc) Cp = 134.31 (J/K)

Oxygen delta moles = -0.000127859 delta grams = -0.00409135
G = 40.47 (J) H = -4.65 (J) S = -0.03 (J/K) V = -14.70 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1100.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.93 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 96.58 (gm) density = 2.49 (gm/cc) viscosity = 5.58 (log 10 poise) (analysis in wt %)
G = -1590706.39 (J) H = -1241693.55 (J) S = 254.17 (J/K) V = 38.83 (cc) Cp = 130.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.87 | 0.52 | 14.89 | 0.67 | 0.00 | 3.22 | 0.01 | 0.98 | 0.00 | 0.00 | 2.47 | 4.06 | 2.19 | 0.10 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.41 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.65Mg1.23Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -49991.45 (J) H = -39224.66 (J) S = 7.84 (J/K) V = 1.01 (cc) Cp = 4.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.16 | 96.21 | 65.40 | 4.76 | -4.53 | 6.92 | 0.40 |

Total solids mass = 3.41 (gm) density = 3.39 (gm/cc)
G = -49991.45 (J) H = -39224.66 (J) S = 7.84 (J/K) V = 1.01 (cc) Cp = 4.11 (J/K)

Viscosity of the System: 5.63 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1640697.83 (J) H = -1280918.22 (J) S = 262.01 (J/K) V = 39.84 (cc) Cp = 134.14 (J/K)

Oxygen delta moles = -0.000164257 delta grams = -0.00525604
G = 51.57 (J) H = -5.91 (J) S = -0.04 (J/K) V = -18.75 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1090.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.91 IW

= 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 96.15 (gm) density = 2.49 (gm/cc) viscosity = 5.69 (log 10 poise) (analysis in wt %)
G = -1582139.10 (J) H = -1238455.60 (J) S = 252.12 (J/K) V = 38.66 (cc) Cp = 129.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.95 | 0.52 | 14.94 | 0.65 | 0.00 | 3.12 | 0.01 | 0.90 | 0.00 | 0.00 | 2.47 | 4.07 | 2.20 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.85 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.68Mg1.21Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -55922.91 (J) H = -43949.69 (J) S = 8.78 (J/K) V = 1.13 (cc) Cp = 4.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.33 | 96.08 | 67.51 | 4.92 | -4.69 | 7.10 | 0.41 |

Total solids mass = 3.85 (gm) density = 3.40 (gm/cc)
G = -55922.91 (J) H = -43949.69 (J) S = 8.78 (J/K) V = 1.13 (cc) Cp = 4.61 (J/K)

Viscosity of the System: 5.74 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1638062.01 (J) H = -1282405.29 (J) S = 260.91 (J/K) V = 39.79 (cc) Cp = 133.97 (J/K)

Oxygen delta moles = -0.000202985 delta grams = -0.00649529
G = 63.21 (J) H = -7.23 (J) S = -0.05 (J/K) V = -23.01 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1080.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.14 COH = 1.89 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 95.72 (gm) density = 2.49 (gm/cc) viscosity = 5.79 (log 10 poise) (analysis in wt %)
G = -1573737.54 (J) H = -1235319.13 (J) S = 250.10 (J/K) V = 38.50 (cc) Cp = 128.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.52 | 14.99 | 0.64 | 0.00 | 3.03 | 0.01 | 0.83 | 0.00 | 0.00 | 2.48 | 4.09 | 2.21 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.27 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.19Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -61698.46 (J) H = -48567.80 (J) S = 9.70 (J/K) V = 1.25 (cc) Cp = 5.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.52 | 95.95 | 69.61 | 5.08 | -4.85 | 7.30 | 0.43 |

Total solids mass = 4.27 (gm) density = 3.41 (gm/cc)
G = -61698.46 (J) H = -48567.80 (J) S = 9.70 (J/K) V = 1.25 (cc) Cp = 5.10 (J/K)

Viscosity of the System: 5.85 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1635436.00 (J) H = -1283886.93 (J) S = 259.80 (J/K) V = 39.75 (cc) Cp = 133.81 (J/K)

Oxygen delta moles = -0.00024405 delta grams = -0.0078093
G = 75.38 (J) H = -8.60 (J) S = -0.06 (J/K) V = -27.46 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1070.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.87 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 94.22 (gm) density = 2.49 (gm/cc) viscosity = 5.90 (log 10 poise) (analysis in wt %)
G = -1547645.63 (J) H = -1218175.67 (J) S = 245.30 (J/K) V = 37.91 (cc) Cp = 126.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.25 | 0.53 | 14.95 | 0.62 | 0.00 | 2.94 | 0.01 | 0.76 | 0.00 | 0.00 | 2.45 | 4.07 | 2.23 | 0.11 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.76 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.72Mg1.16Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -68292.77 (J) H = -53837.44 (J) S = 10.76 (J/K) V = 1.39 (cc) Cp = 5.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.14 | 95.91 | 72.11 | 5.20 | -4.96 | 7.46 | 0.43 |

feldspar mass = 1.00 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.69Ca0.28Al1.28Si2.72O8
G = -16874.54 (J) H = -13629.55 (J) S = 2.42 (J/K) V = 0.39 (cc) Cp = 1.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.20 | 27.90 | 2.90 |

Total solids mass = 5.77 (gm) density = 3.25 (gm/cc)
G = -85167.31 (J) H = -67466.99 (J) S = 13.18 (J/K) V = 1.78 (cc) Cp = 6.90 (J/K)

Viscosity of the System: 5.98 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1632812.94 (J) H = -1285642.67 (J) S = 258.47 (J/K) V = 39.69 (cc) Cp = 133.45 (J/K)

Oxygen delta moles = -0.000300776 delta grams = -0.00962446
G = 92.13 (J) H = -10.49 (J) S = -0.08 (J/K) V = -33.59 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1060.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.84 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 90.53 (gm) density = 2.48 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -1485410.01 (J) H = -1172307.05 (J) S = 234.86 (J/K) V = 36.48 (cc) Cp = 121.34 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.69 0.55 14.72 0.61 0.00 2.87 0.01 0.69 0.00 0.00 2.36 3.96 2.31 0.11 1.11 0.00 0.00 0.00 0.00

orthopyroxene mass = 5.39 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.75Mg1.13Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -76537.50 (J) H = -60403.81 (J) S = 12.10 (J/K) V = 1.57 (cc) Cp = 6.38 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-79.67 96.05 75.45 5.20 -4.98 7.51 0.42

feldspar mass = 4.07 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.27Al1.27Si2.73O8
G = -68241.62 (J) H = -55240.51 (J) S = 9.75 (J/K) V = 1.56 (cc) Cp = 4.97 (J/K)
albite anorthite sanidine
69.87 27.10 3.04

Total solids mass = 9.45 (gm) density = 3.02 (gm/cc)
G = -144779.13 (J) H = -115644.32 (J) S = 21.85 (J/K) V = 3.13 (cc) Cp = 11.35 (J/K)

Viscosity of the System: 6.16 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1630189.14 (J) H = -1287951.37 (J) S = 256.71 (J/K) V = 39.61 (cc) Cp = 132.69 (J/K)

Oxygen delta moles = -0.000388837 delta grams = -0.0124423
G = 118.12 (J) H = -13.42 (J) S = -0.10 (J/K) V = -43.10 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1050.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.12 COH = 1.82 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 85.59 (gm) density = 2.48 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -1402618.42 (J) H = -1109613.34 (J) S = 221.45 (J/K) V = 34.53 (cc) Cp = 114.55 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.92 0.58 14.59 0.60 0.00 2.82 0.01 0.63 0.00 0.00 2.27 3.86 2.42 0.12 1.17 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.04 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.79Mg1.09Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -84955.34 (J) H = -67121.64 (J) S = 13.48 (J/K) V = 1.75 (cc) Cp = 7.12 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-83.28 96.19 78.79 5.27 -5.03 7.64 0.42

feldspar mass = 7.47 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.26Al1.26Si2.74O8
G = -125162.55 (J) H = -101542.75 (J) S = 17.85 (J/K) V = 2.87 (cc) Cp = 9.12 (J/K)
albite anorthite sanidine
70.30 26.47 3.22

quartz mass = 0.89 (gm) density = 2.56 (gm/cc)
SiO2
G = -14843.46 (J) H = -12191.43 (J) S = 2.00 (J/K) V = 0.35 (cc) Cp = 1.06 (J/K)

Total solids mass = 14.39 (gm) density = 2.90 (gm/cc)
G = -224961.36 (J) H = -180855.82 (J) S = 33.33 (J/K) V = 4.96 (cc) Cp = 17.30 (J/K)

Viscosity of the System: 6.34 (log 10 poise)

System mass = 99.98 (gm) density = 2.53 (gm/cc)
G = -1627579.77 (J) H = -1290469.16 (J) S = 254.78 (J/K) V = 39.49 (cc) Cp = 131.85 (J/K)

Oxygen delta moles = -0.000483269 delta grams = -0.015464
G = 145.58 (J) H = -16.51 (J) S = -0.12 (J/K) V = -53.16 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1040.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.11 COH = 1.80 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 79.12 (gm) density = 2.48 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -1294646.30 (J) H = -1026228.65 (J) S = 204.41 (J/K) V = 31.95 (cc) Cp = 105.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.82 | 0.63 | 14.61 | 0.60 | 0.00 | 2.79 | 0.01 | 0.57 | 0.00 | 0.00 | 2.20 | 3.78 | 2.58 | 0.13 | 1.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.72 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.82Mg1.06Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -93625.87 (J) H = -74055.24 (J) S = 14.90 (J/K) V = 1.94 (cc) Cp = 7.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.97 | 96.33 | 82.09 | 5.41 | -5.16 | 7.88 | 0.41 |

feldspar mass = 11.27 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.26Al1.26Si2.74O8
G = -188516.51 (J) H = -153284.45 (J) S = 26.83 (J/K) V = 4.33 (cc) Cp = 13.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.48 | 26.05 | 3.48 |

quartz mass = 2.88 (gm) density = 2.56 (gm/cc)
SiO2
G = -48199.96 (J) H = -39675.96 (J) S = 6.49 (J/K) V = 1.13 (cc) Cp = 3.43 (J/K)

Total solids mass = 20.86 (gm) density = 2.82 (gm/cc)
G = -330342.34 (J) H = -267015.65 (J) S = 48.23 (J/K) V = 7.39 (cc) Cp = 25.18 (J/K)

Viscosity of the System: 6.51 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1624988.64 (J) H = -1293244.30 (J) S = 252.63 (J/K) V = 39.34 (cc) Cp = 131.03 (J/K)

Oxygen delta moles = -0.000583211 delta grams = -0.018662
G = 174.21 (J) H = -19.71 (J) S = -0.15 (J/K) V = -63.67 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1030.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.10 COH = 1.78 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 73.41 (gm) density = 2.47 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -1199634.46 (J) H = -952838.31 (J) S = 189.38 (J/K) V = 29.68 (cc) Cp = 98.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.73 | 0.68 | 14.63 | 0.59 | 0.00 | 2.74 | 0.01 | 0.52 | 0.00 | 0.00 | 2.14 | 3.70 | 2.74 | 0.14 | 1.37 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.34 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.03Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -101368.89 (J) H = -80281.09 (J) S = 16.18 (J/K) V = 2.11 (cc) Cp = 8.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.39 | 96.46 | 85.15 | 5.56 | -5.29 | 8.11 | 0.40 |

feldspar mass = 14.61 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.26Al1.26Si2.74O8
G = -244165.22 (J) H = -198980.24 (J) S = 34.67 (J/K) V = 5.61 (cc) Cp = 17.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.61 | 25.66 | 3.73 |

quartz mass = 4.62 (gm) density = 2.56 (gm/cc)
SiO2
G = -77251.71 (J) H = -63730.58 (J) S = 10.38 (J/K) V = 1.81 (cc) Cp = 5.50 (J/K)

Total solids mass = 26.57 (gm) density = 2.79 (gm/cc)
G = -422785.82 (J) H = -342991.91 (J) S = 61.23 (J/K) V = 9.52 (cc) Cp = 32.05 (J/K)

Viscosity of the System: 6.70 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1622420.28 (J) H = -1295830.22 (J) S = 250.62 (J/K) V = 39.20 (cc) Cp = 130.22 (J/K)

Oxygen delta moles = -0.000679648 delta grams = -0.0217479
G = 201.29 (J) H = -22.73 (J) S = -0.17 (J/K) V = -73.64 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1020.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.10 COH = 1.76 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 68.33 (gm) density = 2.47 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -1115491.01 (J) H = -887824.48 (J) S = 176.06 (J/K) V = 27.66 (cc) Cp = 91.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.64 | 0.73 | 14.65 | 0.58 | 0.00 | 2.68 | 0.01 | 0.48 | 0.00 | 0.00 | 2.08 | 3.62 | 2.91 | 0.15 | 1.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.90 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.88Mg1.00Fe"'0.03Ti0.00Al0.14Si1.91O6
G = -108294.75 (J) H = -85886.71 (J) S = 17.33 (J/K) V = 2.26 (cc) Cp = 9.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.53 | 96.59 | 87.93 | 5.70 | -5.41 | 8.32 | 0.40 |

feldspar mass = 17.58 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -293337.13 (J) H = -239591.35 (J) S = 41.56 (J/K) V = 6.75 (cc) Cp = 21.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.71 | 25.31 | 3.98 |

quartz mass = 6.15 (gm) density = 2.56 (gm/cc)
SiO2
G = -102750.82 (J) H = -84953.63 (J) S = 13.76 (J/K) V = 2.41 (cc) Cp = 7.32 (J/K)

Total solids mass = 31.64 (gm) density = 2.77 (gm/cc)
G = -504382.71 (J) H = -410431.69 (J) S = 72.65 (J/K) V = 11.42 (cc) Cp = 38.13 (J/K)

Viscosity of the System: 6.90 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1619873.72 (J) H = -1298256.18 (J) S = 248.71 (J/K) V = 39.08 (cc) Cp = 129.49 (J/K)

Oxygen delta moles = -0.000772157 delta grams = -0.0247081
G = 226.74 (J) H = -25.55 (J) S = -0.20 (J/K) V = -83.02 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 1010.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.09 COH = 1.73 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 63.80 (gm) density = 2.47 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -1040566.62 (J) H = -829912.36 (J) S = 164.17 (J/K) V = 25.86 (cc) Cp = 85.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.56 | 0.78 | 14.68 | 0.57 | 0.00 | 2.59 | 0.02 | 0.44 | 0.00 | 0.00 | 2.02 | 3.53 | 3.07 | 0.16 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.42 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg0.97Fe"'0.03Ti0.00Al0.15Si1.91O6
G = -114488.23 (J) H = -90938.85 (J) S = 18.35 (J/K) V = 2.40 (cc) Cp = 9.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.38 | 96.71 | 90.46 | 5.84 | -5.53 | 8.51 | 0.39 |

feldspar mass = 20.23 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -337004.94 (J) H = -275878.95 (J) S = 47.64 (J/K) V = 7.77 (cc) Cp = 24.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.78 | 25.00 | 4.23 |

quartz mass = 7.52 (gm) density = 2.56 (gm/cc)
SiO2
G = -125288.34 (J) H = -103815.45 (J) S = 16.73 (J/K) V = 2.94 (cc) Cp = 8.93 (J/K)

Total solids mass = 36.17 (gm) density = 2.76 (gm/cc)
G = -576781.52 (J) H = -470633.26 (J) S = 82.72 (J/K) V = 13.11 (cc) Cp = 43.53 (J/K)

Viscosity of the System: 7.13 (log 10 poise)

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1617348.14 (J) H = -1300545.62 (J) S = 246.89 (J/K) V = 38.97 (cc) Cp = 128.83 (J/K)

Oxygen delta moles = -0.00086038 delta grams = -0.0275311
G = 250.48 (J) H = -28.15 (J) S = -0.22 (J/K) V = -91.79 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 59.75 (gm) density = 2.46 (gm/cc) viscosity = 6.18 (log 10 poise) (analysis in wt %)
G = -973530.27 (J) H = -778073.82 (J) S = 153.52 (J/K) V = 24.25 (cc) Cp = 79.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.48 | 0.83 | 14.72 | 0.55 | 0.00 | 2.50 | 0.02 | 0.40 | 0.00 | 0.00 | 1.97 | 3.44 | 3.23 | 0.17 | 1.68 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.89 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.95Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -120018.95 (J) H = -95491.76 (J) S = 19.26 (J/K) V = 2.52 (cc) Cp = 10.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.95 | 96.83 | 92.73 | 5.97 | -5.64 | 8.68 | 0.38 |

feldspar mass = 22.61 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -375956.91 (J) H = -308459.79 (J) S = 53.02 (J/K) V = 8.68 (cc) Cp = 27.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.82 | 24.71 | 4.48 |

quartz mass = 8.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -145336.67 (J) H = -120692.14 (J) S = 19.36 (J/K) V = 3.41 (cc) Cp = 10.36 (J/K)

Total solids mass = 40.22 (gm) density = 2.75 (gm/cc)

G = -641312.53 (J)  H = -524643.69 (J)  S = 91.64 (J/K)  V = 14.62 (cc)  Cp = 48.36 (J/K)

Viscosity of the System: 7.39 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.57 (gm/cc)
G = -1614842.80 (J)  H = -1302717.51 (J)  S = 245.16 (J/K)  V = 38.87 (cc)  Cp = 128.22 (J/K)

Oxygen  delta moles = -0.000944068  delta grams = -0.030209
G = 272.46 (J)  H = -30.55 (J)  S = -0.24 (J/K)  V = -99.93 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 990.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.68  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 56.09 (gm)  density = 2.46 (gm/cc)  viscosity = 6.20 (log 10 poise)  (analysis in wt %)
G = -913289.48 (J)  H = -731465.57 (J)  S = 143.94 (J/K)  V = 22.80 (cc)  Cp = 74.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.39 | 0.89 | 14.76 | 0.54 | 0.00 | 2.39 | 0.02 | 0.37 | 0.00 | 0.00 | 1.93 | 3.35 | 3.40 | 0.18 | 1.79 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.31 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.95Mg0.93Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -124947.63 (J)  H = -99592.13 (J)  S = 20.07 (J/K)  V = 2.64 (cc)  Cp = 10.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.25 | 96.94 | 94.76 | 6.10 | -5.75 | 8.83 | 0.37 |

feldspar  mass = 24.74 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -410841.96 (J)  H = -337841.67 (J)  S = 57.79 (J/K)  V = 9.50 (cc)  Cp = 30.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.84 | 24.44 | 4.72 |

quartz  mass = 9.82 (gm)  density = 2.56 (gm/cc)
SiO2
G = -163277.96 (J)  H = -135888.12 (J)  S = 21.68 (J/K)  V = 3.84 (cc)  Cp = 11.65 (J/K)

Total solids  mass = 43.88 (gm)  density = 2.75 (gm/cc)
G = -699067.55 (J)  H = -573321.92 (J)  S = 99.55 (J/K)  V = 15.98 (cc)  Cp = 52.70 (J/K)

Viscosity of the System: 7.71 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.58 (gm/cc)
G = -1612357.03 (J)  H = -1304787.49 (J)  S = 243.49 (J/K)  V = 38.77 (cc)  Cp = 127.67 (J/K)

Oxygen  delta moles = -0.00102309  delta grams = -0.0327375
G = 292.68 (J)  H = -32.74 (J)  S = -0.26 (J/K)  V = -107.45 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 980.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.66  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 52.79 (gm)  density = 2.46 (gm/cc)  viscosity = 6.21 (log 10 poise)  (analysis in wt %)
G = -858935.16 (J)  H = -689386.32 (J)  S = 135.30 (J/K)  V = 21.48 (cc)  Cp = 70.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.30 | 0.94 | 14.80 | 0.52 | 0.00 | 2.28 | 0.02 | 0.34 | 0.00 | 0.00 | 1.89 | 3.26 | 3.56 | 0.19 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.70 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.97Mg0.91Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -129329.52 (J)  H = -103281.95 (J)  S = 20.79 (J/K)  V = 2.74 (cc)  Cp = 11.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.31 | 97.04 | 96.57 | 6.23 | -5.86 | 8.96 | 0.37 |

feldspar  mass = 26.67 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -442201.07 (J)  H = -364448.07 (J)  S = 62.05 (J/K)  V = 10.24 (cc)  Cp = 32.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.84 | 24.20 | 4.96 |

quartz  mass = 10.81 (gm)  density = 2.56 (gm/cc)
SiO2
G = -179424.44 (J)  H = -149652.30 (J)  S = 23.76 (J/K)  V = 4.23 (cc)  Cp = 12.81 (J/K)

Total solids  mass = 47.17 (gm)  density = 2.74 (gm/cc)
G = -750955.03 (J)  H = -617382.33 (J)  S = 106.59 (J/K)  V = 17.20 (cc)  Cp = 56.60 (J/K)

Viscosity of the System: 8.13 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.58 (gm/cc)
G = -1609890.19 (J)  H = -1306768.64 (J)  S = 241.89 (J/K)  V = 38.69 (cc)  Cp = 127.16 (J/K)

Oxygen  delta moles = -0.00109741  delta grams = -0.0351159
G = 311.19 (J)  H = -34.73 (J)  S = -0.28 (J/K)  V = -114.34 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 970.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.06  COH = 1.64  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 49.80 (gm)  density = 2.45 (gm/cc)  viscosity = 6.23 (log 10 poise)  (analysis in wt %)
G = -809702.66 (J)  H = -651246.57 (J)  S = 127.46 (J/K)  V = 20.29 (cc)  Cp = 66.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.21 | 1.00 | 14.85 | 0.49 | 0.00 | 2.16 | 0.02 | 0.32 | 0.00 | 0.00 | 1.85 | 3.17 | 3.71 | 0.20 | 2.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.04 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.89Fe"'0.03Ti0.00Al0.16Si1.91O6
G = -133216.09 (J) H = -106599.98 (J) S = 21.41 (J/K) V = 2.83 (cc) Cp = 11.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.15 | 97.14 | 98.17 | 6.36 | -5.96 | 9.08 | 0.36 |

feldspar mass = 28.42 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -470489.55 (J) H = -388635.63 (J) S = 65.84 (J/K) V = 10.91 (cc) Cp = 34.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.82 | 23.98 | 5.20 |

quartz mass = 11.70 (gm) density = 2.56 (gm/cc)
SiO2
G = -194033.40 (J) H = -162189.91 (J) S = 25.62 (J/K) V = 4.58 (cc) Cp = 13.86 (J/K)

Total solids mass = 50.16 (gm) density = 2.74 (gm/cc)
G = -797739.04 (J) H = -657425.51 (J) S = 112.87 (J/K) V = 18.31 (cc) Cp = 60.12 (J/K)

Viscosity of the System: 8.81 (log 10 poise)

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1607441.70 (J) H = -1308672.09 (J) S = 240.33 (J/K) V = 38.61 (cc) Cp = 126.69 (J/K)

Oxygen delta moles = -0.00116712 delta grams = -0.0373463
G = 328.02 (J) H = -36.52 (J) S = -0.29 (J/K) V = -120.63 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 960.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.05 COH = 1.61 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 47.08 (gm) density = 2.45 (gm/cc) viscosity = 6.24 (log 10 poise) (analysis in wt %)
G = -764943.62 (J) H = -616546.77 (J) S = 120.34 (J/K) V = 19.21 (cc) Cp = 62.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.10 | 1.05 | 14.90 | 0.47 | 0.00 | 2.04 | 0.02 | 0.30 | 0.00 | 0.00 | 1.81 | 3.08 | 3.87 | 0.21 | 2.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.35 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.88Fe"'0.03Ti0.00Al0.16Si1.90O6
G = -136655.63 (J) H = -109582.34 (J) S = 21.95 (J/K) V = 2.91 (cc) Cp = 11.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.78 | 97.23 | 99.60 | 6.48 | -6.06 | 9.17 | 0.35 |

feldspar mass = 30.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -496093.44 (J) H = -410706.90 (J) S = 69.24 (J/K) V = 11.52 (cc) Cp = 36.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.78 | 23.78 | 5.44 |

quartz mass = 12.52 (gm) density = 2.56 (gm/cc)
SiO2
G = -207318.28 (J) H = -173671.33 (J) S = 27.29 (J/K) V = 4.90 (cc) Cp = 14.81 (J/K)

Total solids mass = 52.88 (gm) density = 2.74 (gm/cc)
G = -840067.35 (J) H = -693960.56 (J) S = 118.48 (J/K) V = 19.33 (cc) Cp = 63.31 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1605010.98 (J) H = -1310507.33 (J) S = 238.82 (J/K) V = 38.53 (cc) Cp = 126.25 (J/K)

Oxygen delta moles = -0.00123234 delta grams = -0.0394333
G = 343.25 (J) H = -38.12 (J) S = -0.31 (J/K) V = -126.35 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 950.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.04 COH = 1.58 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 44.29 (gm) density = 2.45 (gm/cc) viscosity = 6.26 (log 10 poise) (analysis in wt %)
G = -719510.40 (J) H = -581166.31 (J) S = 113.10 (J/K) V = 18.11 (cc) Cp = 59.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.09 | 0.98 | 14.98 | 0.44 | 0.00 | 1.90 | 0.02 | 0.28 | 0.00 | 0.00 | 1.77 | 2.99 | 4.04 | 0.23 | 2.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.55 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.87Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -138749.58 (J) H = -111525.52 (J) S = 22.26 (J/K) V = 2.96 (cc) Cp = 12.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.73 | 97.30 | 100.46 | 6.56 | -6.16 | 9.22 | 0.35 |

feldspar mass = 31.60 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -521473.66 (J) H = -432688.29 (J) S = 72.59 (J/K) V = 12.13 (cc) Cp = 38.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.64 | 23.63 | 5.73 |

quartz mass = 13.40 (gm) density = 2.56 (gm/cc)
SiO2
G = -221567.22 (J) H = -186010.23 (J) S = 29.07 (J/K) V = 5.24 (cc) Cp = 15.84 (J/K)

rhm-oxide mass = 0.13 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe'"0.19Al0.15Ti0.83O3
G = -1309.61 (J) H = -998.87 (J) S = 0.25 (J/K) V = 0.03 (cc) Cp = 0.13 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.19 | 9.36 | 72.74 | 0.30 | 7.41 |

Total solids mass = 55.67 (gm) density = 2.74 (gm/cc)

G = -883100.07 (J)  H = -731222.91 (J)  S = 124.17 (J/K)  V = 20.35 (cc)  Cp = 66.56 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.60 (gm/cc)
G = -1602610.47 (J)  H = -1312389.22 (J)  S = 237.27 (J/K)  V = 38.47 (cc)  Cp = 125.79 (J/K)

Oxygen  delta moles = -0.00126984  delta grams = -0.0406335
G = 350.51 (J)  H = -38.83 (J)  S = -0.32 (J/K)  V = -129.14 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 940.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = 0.03  COH = 1.56  IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 41.79 (gm)  density = 2.44 (gm/cc)  viscosity = 6.27 (log 10 poise)  (analysis in wt %)
G = -678764.49 (J)  H = -549414.50 (J)  S = 106.62 (J/K)  V = 17.12 (cc)  Cp = 55.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.93 | 15.06 | 0.42 | 0.00 | 1.77 | 0.02 | 0.26 | 0.00 | 0.00 | 1.73 | 2.90 | 4.21 | 0.24 | 2.41 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.72 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.01Mg0.86Fe"'0.03Ti0.00Al0.16Si1.90O6
G = -140624.90 (J)  H = -113304.80 (J)  S = 22.52 (J/K)  V = 3.01 (cc)  Cp = 12.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.61 | 97.38 | 101.24 | 6.64 | -6.26 | 9.27 | 0.34 |

feldspar  mass = 33.03 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -544207.54 (J)  H = -452563.97 (J)  S = 75.54 (J/K)  V = 12.67 (cc)  Cp = 40.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.50 | 23.48 | 6.02 |

quartz  mass = 14.18 (gm)  density = 2.56 (gm/cc)
SiO2
G = -234300.05 (J)  H = -197125.16 (J)  S = 30.64 (J/K)  V = 5.55 (cc)  Cp = 16.76 (J/K)

rhm-oxide  mass = 0.23 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe"'0.18Al0.15Ti0.83O3
G = -2327.70 (J)  H = -1780.93 (J)  S = 0.45 (J/K)  V = 0.05 (cc)  Cp = 0.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.03 | 9.23 | 73.11 | 0.31 | 7.32 |

Total solids  mass = 58.17 (gm)  density = 2.73 (gm/cc)
G = -921460.18 (J)  H = -764774.86 (J)  S = 129.16 (J/K)  V = 21.28 (cc)  Cp = 69.46 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.60 (gm/cc)
G = -1600224.67 (J)  H = -1314189.36 (J)  S = 235.78 (J/K)  V = 38.40 (cc)  Cp = 125.36 (J/K)

Oxygen delta moles = -0.00130825 delta grams = -0.0418625
G = 357.84 (J) H = -39.53 (J) S = -0.33 (J/K) V = -131.96 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 930.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.02 COH = 1.53 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 39.51 (gm) density = 2.44 (gm/cc) viscosity = 6.28 (log 10 poise) (analysis in wt %)
G = -641639.45 (J) H = -520452.89 (J) S = 100.72 (J/K) V = 16.22 (cc) Cp = 52.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.99 | 0.88 | 15.14 | 0.39 | 0.00 | 1.64 | 0.02 | 0.24 | 0.00 | 0.00 | 1.70 | 2.81 | 4.37 | 0.25 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.88 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.02Mg0.86Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -142232.27 (J) H = -114880.53 (J) S = 22.73 (J/K) V = 3.05 (cc) Cp = 12.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.39 | 97.45 | 101.93 | 6.73 | -6.36 | 9.31 | 0.33 |

feldspar mass = 34.33 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -564851.14 (J) H = -470782.55 (J) S = 78.19 (J/K) V = 13.17 (cc) Cp = 41.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.35 | 23.34 | 6.31 |

quartz mass = 14.91 (gm) density = 2.56 (gm/cc)
SiO2
G = -245919.60 (J) H = -207347.48 (J) S = 32.06 (J/K) V = 5.83 (cc) Cp = 17.59 (J/K)

rhm-oxide mass = 0.32 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe'"0.18Al0.14Ti0.84O3
G = -3211.94 (J) H = -2465.20 (J) S = 0.62 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.88 | 9.09 | 73.47 | 0.33 | 7.23 |

Total solids mass = 60.44 (gm) density = 2.73 (gm/cc)
G = -956214.96 (J) H = -795475.75 (J) S = 133.60 (J/K) V = 22.12 (cc) Cp = 72.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1597854.41 (J) H = -1315928.64 (J) S = 234.32 (J/K) V = 38.34 (cc) Cp = 124.97 (J/K)

Oxygen delta moles = -0.00134524 delta grams = -0.0430461
G = 364.59 (J) H = -40.17 (J) S = -0.34 (J/K) V = -134.57 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 920.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = 0.02  COH = 1.50  IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 37.43 (gm)  density = 2.43 (gm/cc)  viscosity = 6.29 (log 10 poise)  (analysis in wt %)
G = -607644.54 (J)  H = -493901.75 (J)  S = 95.33 (J/K)  V = 15.40 (cc)  Cp = 50.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.92 | 0.83 | 15.23 | 0.37 | 0.00 | 1.52 | 0.03 | 0.23 | 0.00 | 0.00 | 1.67 | 2.73 | 4.53 | 0.27 | 2.69 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.02 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.85Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -143607.73 (J)  H = -116279.69 (J)  S = 22.90 (J/K)  V = 3.08 (cc)  Cp = 12.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.08 | 97.52 | 102.53 | 6.82 | -6.46 | 9.35 | 0.33 |

feldspar  mass = 35.53 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -583683.28 (J)  H = -487565.22 (J)  S = 80.56 (J/K)  V = 13.63 (cc)  Cp = 43.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.19 | 23.20 | 6.61 |

quartz  mass = 15.57 (gm)  density = 2.56 (gm/cc)
SiO2
G = -256580.42 (J)  H = -216801.64 (J)  S = 33.34 (J/K)  V = 6.09 (cc)  Cp = 18.36 (J/K)

rhm-oxide  mass = 0.40 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.00Fe"0.74Mg0.10Fe'"0.18Al0.14Ti0.84O3
G = -3983.36 (J)  H = -3066.96 (J)  S = 0.77 (J/K)  V = 0.09 (cc)  Cp = 0.38 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.74 | 8.93 | 73.83 | 0.35 | 7.15 |

Total solids  mass = 62.52 (gm)  density = 2.73 (gm/cc)
G = -987854.79 (J)  H = -823713.51 (J)  S = 137.57 (J/K)  V = 22.89 (cc)  Cp = 74.50 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.61 (gm/cc)
G = -1595499.33 (J)  H = -1317615.25 (J)  S = 232.90 (J/K)  V = 38.29 (cc)  Cp = 124.60 (J/K)

Oxygen  delta moles = -0.00138082  delta grams = -0.0441847
G = 370.78 (J)  H = -40.74 (J)  S = -0.34 (J/K)  V = -136.98 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 910.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = 0.01  COH = 1.48  IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 35.52 (gm) density = 2.43 (gm/cc) viscosity = 6.30 (log 10 poise) (analysis in wt %)
G = -576368.28 (J) H = -469442.59 (J) S = 90.37 (J/K) V = 14.64 (cc) Cp = 47.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.83 | 0.79 | 15.31 | 0.34 | 0.00 | 1.41 | 0.03 | 0.22 | 0.00 | 0.00 | 1.64 | 2.64 | 4.69 | 0.28 | 2.83 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.14 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.85Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -144782.69 (J) H = -117525.87 (J) S = 23.04 (J/K) V = 3.11 (cc) Cp = 12.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.69 | 97.59 | 103.05 | 6.91 | -6.57 | 9.39 | 0.32 |

feldspar mass = 36.64 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -600938.08 (J) H = -503097.79 (J) S = 82.69 (J/K) V = 14.05 (cc) Cp = 44.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.02 | 23.08 | 6.91 |

quartz mass = 16.19 (gm) density = 2.56 (gm/cc)
SiO2
G = -266411.02 (J) H = -225591.21 (J) S = 34.50 (J/K) V = 6.33 (cc) Cp = 19.08 (J/K)

rhm-oxide mass = 0.47 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.74Mg0.10Fe'"0.18Al0.14Ti0.84O3
G = -4659.02 (J) H = -3598.61 (J) S = 0.90 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.62 | 8.77 | 74.18 | 0.37 | 7.07 |

Total solids mass = 64.44 (gm) density = 2.73 (gm/cc)
G = -1016790.81 (J) H = -849813.47 (J) S = 141.13 (J/K) V = 23.60 (cc) Cp = 76.69 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1593159.09 (J) H = -1319256.06 (J) S = 231.50 (J/K) V = 38.24 (cc) Cp = 124.26 (J/K)

Oxygen delta moles = -0.00141503 delta grams = -0.0452794
G = 376.44 (J) H = -41.25 (J) S = -0.35 (J/K) V = -139.20 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 33.75 (gm) density = 2.42 (gm/cc) viscosity = 6.30 (log 10 poise) (analysis in wt %)
G = -547463.01 (J) H = -446806.13 (J) S = 85.80 (J/K) V = 13.93 (cc) Cp = 45.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.72 | 0.75 | 15.40 | 0.32 | 0.00 | 1.30 | 0.03 | 0.20 | 0.00 | 0.00 | 1.61 | 2.56 | 4.84 | 0.30 | 2.98 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.24 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.84Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -145784.54 (J) H = -118639.63 (J) S = 23.14 (J/K) V = 3.14 (cc) Cp = 12.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.24 | 97.67 | 103.51 | 7.01 | -6.67 | 9.42 | 0.31 |

feldspar mass = 37.67 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -616813.84 (J) H = -517537.75 (J) S = 84.62 (J/K) V = 14.44 (cc) Cp = 45.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.84 | 22.95 | 7.20 |

quartz mass = 16.77 (gm) density = 2.56 (gm/cc)
SiO2
G = -275519.19 (J) H = -233803.07 (J) S = 35.56 (J/K) V = 6.56 (cc) Cp = 19.74 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.75Mg0.09Fe'"0.17Al0.14Ti0.84O3
G = -5252.87 (J) H = -4070.27 (J) S = 1.01 (J/K) V = 0.11 (cc) Cp = 0.50 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.50 | 8.60 | 74.53 | 0.39 | 6.99 |

Total solids mass = 66.20 (gm) density = 2.73 (gm/cc)
G = -1043370.44 (J) H = -874050.72 (J) S = 144.33 (J/K) V = 24.25 (cc) Cp = 78.72 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1590833.44 (J) H = -1320856.85 (J) S = 230.13 (J/K) V = 38.19 (cc) Cp = 123.93 (J/K)

Oxygen delta moles = -0.00144791 delta grams = -0.0463315
G = 381.57 (J) H = -41.69 (J) S = -0.36 (J/K) V = -141.23 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 890.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.01 COH = 1.42 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 32.03 (gm) density = 2.42 (gm/cc) viscosity = 6.28 (log 10 poise) (analysis in wt %)
G = -519247.56 (J) H = -424586.09 (J) S = 81.38 (J/K) V = 13.25 (cc) Cp = 42.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.68 | 0.71 | 15.37 | 0.30 | 0.00 | 1.19 | 0.03 | 0.19 | 0.00 | 0.00 | 1.59 | 2.51 | 4.98 | 0.31 | 3.14 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.69 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.11Fe"0.62Mg0.27)3Al2Si3O12
G = -9356.14 (J) H = -7748.60 (J) S = 1.38 (J/K) V = 0.18 (cc) Cp = 0.75 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.94 | 11.43 | 26.63 |

orthopyroxene mass = 10.83 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.85Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -140502.20 (J) H = -114676.48 (J) S = 22.20 (J/K) V = 3.03 (cc) Cp = 12.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.49 | 97.67 | 103.00 | 6.91 | -6.59 | 9.18 | 0.31 |

feldspar mass = 38.40 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.23Al1.23Si2.77O8
G = -627830.97 (J) H = -527934.07 (J) S = 85.88 (J/K) V = 14.73 (cc) Cp = 46.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.80 | 22.60 | 7.60 |

quartz mass = 17.41 (gm) density = 2.56 (gm/cc)
SiO2
G = -285799.70 (J) H = -243044.57 (J) S = 36.76 (J/K) V = 6.81 (cc) Cp = 20.48 (J/K)

rhm-oxide mass = 0.58 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.75Mg0.10Fe'"0.17Al0.14Ti0.85O3
G = -5770.94 (J) H = -4486.67 (J) S = 1.10 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.55 | 8.35 | 74.86 | 0.41 | 6.83 |

Total solids mass = 67.92 (gm) density = 2.73 (gm/cc)
G = -1069259.95 (J) H = -897890.40 (J) S = 147.33 (J/K) V = 24.86 (cc) Cp = 80.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1588507.51 (J) H = -1322476.48 (J) S = 228.72 (J/K) V = 38.11 (cc) Cp = 123.57 (J/K)

Oxygen delta moles = -0.00150738 delta grams = -0.0482344
G = 393.49 (J) H = -42.87 (J) S = -0.38 (J/K) V = -145.78 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 880.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.02 COH = 1.39 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 30.34 (gm) density = 2.41 (gm/cc) viscosity = 6.25 (log 10 poise) (analysis in wt %)
G = -491683.44 (J) H = -402761.28 (J) S = 77.11 (J/K) V = 12.58 (cc) Cp = 40.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.68 | 0.67 | 15.22 | 0.27 | 0.00 | 1.07 | 0.03 | 0.19 | 0.00 | 0.00 | 1.59 | 2.51 | 5.12 | 0.33 | 3.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.95 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.62Mg0.27)3Al2Si3O12
G = -26297.80 (J) H = -21837.19 (J) S = 3.87 (J/K) V = 0.49 (cc) Cp = 2.12 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.54 | 11.72 | 26.73 |

orthopyroxene mass = 10.01 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.02Mg0.87Fe'"0.02Ti0.00Al0.16Si1.91O6
G = -130164.35 (J) H = -106589.09 (J) S = 20.44 (J/K) V = 2.80 (cc) Cp = 11.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.50 | 97.62 | 101.56 | 6.63 | -6.32 | 8.70 | 0.31 |

feldspar mass = 38.89 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -634829.23 (J) H = -534968.38 (J) S = 86.60 (J/K) V = 14.92 (cc) Cp = 47.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.87 | 22.03 | 8.10 |

quartz mass = 18.12 (gm) density = 2.56 (gm/cc)
SiO2
G = -296989.07 (J) H = -253097.47 (J) S = 38.06 (J/K) V = 7.09 (cc) Cp = 21.29 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.75Mg0.10Fe'"0.16Al0.13Ti0.85O3
G = -6222.51 (J) H = -4854.57 (J) S = 1.19 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.76 | 8.04 | 75.18 | 0.44 | 6.59 |

Total solids mass = 69.61 (gm) density = 2.74 (gm/cc)
G = -1094502.95 (J) H = -921346.69 (J) S = 150.16 (J/K) V = 25.44 (cc) Cp = 82.51 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1586186.39 (J) H = -1324107.98 (J) S = 227.27 (J/K) V = 38.02 (cc) Cp = 123.19 (J/K)

Oxygen delta moles = -0.00158512 delta grams = -0.0507219
G = 409.84 (J) H = -44.52 (J) S = -0.39 (J/K) V = -151.98 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 28.76 (gm) density = 2.41 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -465826.81 (J) H = -382244.52 (J) S = 73.12 (J/K) V = 11.95 (cc) Cp = 38.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.66 | 0.64 | 15.07 | 0.25 | 0.00 | 0.96 | 0.03 | 0.19 | 0.00 | 0.00 | 1.58 | 2.51 | 5.26 | 0.35 | 3.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.10 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.61Mg0.27)3Al2Si3O12
G = -41826.62 (J) H = -34824.18 (J) S = 6.13 (J/K) V = 0.78 (cc) Cp = 3.37 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.12 | 12.04 | 26.84 |

orthopyroxene mass = 9.26 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.89Fe'"0.02Ti0.00Al0.15Si1.91O6
G = -120705.11 (J) H = -99169.25 (J) S = 18.84 (J/K) V = 2.60 (cc) Cp = 10.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.44 | 97.56 | 100.05 | 6.35 | -6.06 | 8.22 | 0.31 |

feldspar mass = 39.36 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -641472.97 (J) H = -541729.29 (J) S = 87.25 (J/K) V = 15.10 (cc) Cp = 47.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.90 | 21.47 | 8.62 |

quartz mass = 18.78 (gm) density = 2.56 (gm/cc)
SiO2
G = -307431.27 (J) H = -262552.35 (J) S = 39.26 (J/K) V = 7.34 (cc) Cp = 22.04 (J/K)

rhm-oxide mass = 0.67 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.75Mg0.10Fe'"0.15Al0.13Ti0.86O3
G = -6621.65 (J) H = -5183.92 (J) S = 1.26 (J/K) V = 0.15 (cc) Cp = 0.63 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.98 | 7.73 | 75.46 | 0.48 | 6.36 |

Total solids mass = 71.18 (gm) density = 2.74 (gm/cc)
G = -1118057.61 (J) H = -943458.99 (J) S = 152.73 (J/K) V = 25.97 (cc) Cp = 84.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1583884.42 (J) H = -1325703.51 (J) S = 225.85 (J/K) V = 37.93 (cc) Cp = 122.83 (J/K)

Oxygen delta moles = -0.00165382 delta grams = -0.0529204
G = 423.50 (J) H = -45.86 (J) S = -0.41 (J/K) V = -157.19 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 27.27 (gm) density = 2.40 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -441412.25 (J) H = -362825.23 (J) S = 69.35 (J/K) V = 11.36 (cc) Cp = 36.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.62 | 0.60 | 14.94 | 0.23 | 0.00 | 0.86 | 0.03 | 0.18 | 0.00 | 0.00 | 1.58 | 2.52 | 5.38 | 0.37 | 3.69 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.17 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.61Mg0.27)3Al2Si3O12
G = -56154.06 (J) H = -46877.01 (J) S = 8.19 (J/K) V = 1.05 (cc) Cp = 4.52 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.67 | 12.36 | 26.97 |

orthopyroxene mass = 8.57 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.98Mg0.91Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -112001.69 (J) H = -92322.45 (J) S = 17.37 (J/K) V = 2.41 (cc) Cp = 9.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.31 | 97.50 | 98.45 | 6.08 | -5.80 | 7.77 | 0.32 |

feldspar mass = 39.82 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -647819.48 (J) H = -548263.07 (J) S = 87.86 (J/K) V = 15.28 (cc) Cp = 48.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.90 | 20.93 | 9.17 |

quartz mass = 19.40 (gm) density = 2.56 (gm/cc)
SiO2
G = -317237.22 (J) H = -271500.01 (J) S = 40.36 (J/K) V = 7.59 (cc) Cp = 22.75 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.10Fe'"0.15Al0.12Ti0.86O3
G = -6976.09 (J) H = -5480.38 (J) S = 1.32 (J/K) V = 0.15 (cc) Cp = 0.67 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.21 | 7.42 | 75.72 | 0.51 | 6.14 |

Total solids mass = 72.67 (gm) density = 2.74 (gm/cc)
G = -1140188.54 (J) H = -964442.92 (J) S = 155.09 (J/K) V = 26.49 (cc) Cp = 85.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1581600.78 (J) H = -1327268.16 (J) S = 224.45 (J/K) V = 37.84 (cc) Cp = 122.49 (J/K)

Oxygen delta moles = -0.00171467 delta grams = -0.0548673
G = 434.82 (J) H = -46.94 (J) S = -0.43 (J/K) V = -161.54 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 850.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.05 COH = 1.30 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 25.85 (gm) density = 2.40 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -418207.02 (J) H = -344317.98 (J) S = 65.79 (J/K) V = 10.79 (cc) Cp = 34.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.55 | 0.57 | 14.81 | 0.21 | 0.00 | 0.78 | 0.03 | 0.18 | 0.00 | 0.00 | 1.58 | 2.52 | 5.48 | 0.39 | 3.89 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.15 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.13Fe"0.60Mg0.27)3Al2Si3O12
G = -69462.83 (J) H = -58140.84 (J) S = 10.08 (J/K) V = 1.30 (cc) Cp = 5.59 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.20 | 12.70 | 27.10 |

orthopyroxene mass = 7.94 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.97Mg0.93Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -103947.63 (J) H = -85966.42 (J) S = 16.01 (J/K) V = 2.23 (cc) Cp = 9.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.12 | 97.44 | 96.78 | 5.81 | -5.54 | 7.32 | 0.32 |

feldspar mass = 40.26 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -653921.11 (J) H = -554612.26 (J) S = 88.42 (J/K) V = 15.46 (cc) Cp = 48.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.86 | 20.38 | 9.75 |

quartz mass = 20.00 (gm) density = 2.56 (gm/cc)
SiO2
G = -326503.93 (J) H = -280020.14 (J) S = 41.39 (J/K) V = 7.82 (cc) Cp = 23.42 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.10Fe'"0.14Al0.12Ti0.87O3
G = -7292.25 (J) H = -5748.65 (J) S = 1.37 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.44 | 7.12 | 75.96 | 0.54 | 5.94 |

Total solids mass = 74.09 (gm) density = 2.75 (gm/cc)
G = -1161127.74 (J) H = -984488.32 (J) S = 157.27 (J/K) V = 26.97 (cc) Cp = 87.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1579334.76 (J) H = -1328806.29 (J) S = 223.06 (J/K) V = 37.77 (cc) Cp = 122.17 (J/K)

Oxygen delta moles = -0.00176864 delta grams = -0.0565945
G = 444.13 (J) H = -47.79 (J) S = -0.44 (J/K) V = -165.16 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 840.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.06 COH = 1.27 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 24.50 (gm) density = 2.39 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -396004.20 (J) H = -326556.94 (J) S = 62.39 (J/K) V = 10.25 (cc) Cp = 32.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.46 | 0.54 | 14.68 | 0.20 | 0.00 | 0.70 | 0.03 | 0.18 | 0.00 | 0.00 | 1.59 | 2.53 | 5.58 | 0.41 | 4.10 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.08 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.13Fe"0.60Mg0.27)3Al2Si3O12
G = -81912.23 (J) H = -68742.79 (J) S = 11.83 (J/K) V = 1.54 (cc) Cp = 6.58 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.70 | 13.06 | 27.24 |

orthopyroxene mass = 7.34 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.95Mg0.95Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -96449.72 (J) H = -80028.87 (J) S = 14.75 (J/K) V = 2.07 (cc) Cp = 8.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.86 | 97.37 | 95.02 | 5.54 | -5.29 | 6.90 | 0.32 |

feldspar mass = 40.70 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -659826.32 (J) H = -560816.50 (J) S = 88.95 (J/K) V = 15.63 (cc) Cp = 49.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.80 | 19.84 | 10.37 |

quartz mass = 20.56 (gm) density = 2.56 (gm/cc)
SiO2
G = -335317.79 (J) H = -288183.98 (J) S = 42.34 (J/K) V = 8.04 (cc) Cp = 24.06 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.11Fe'"0.14Al0.11Ti0.87O3
G = -7575.51 (J) H = -5992.68 (J) S = 1.42 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.69 | 6.82 | 76.16 | 0.58 | 5.74 |

Total solids mass = 75.45 (gm) density = 2.75 (gm/cc)
G = -1181081.57 (J) H = -1003764.81 (J) S = 159.29 (J/K) V = 27.44 (cc) Cp = 88.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1577085.77 (J) H = -1330321.76 (J) S = 221.68 (J/K) V = 37.69 (cc) Cp = 121.86 (J/K)

Oxygen delta moles = -0.00181663 delta grams = -0.0581298
G = 451.68 (J) H = -48.45 (J) S = -0.45 (J/K) V = -168.13 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 23.19 (gm) density = 2.38 (gm/cc) viscosity = 5.98 (log 10 poise) (analysis in wt %)
G = -374617.05 (J) H = -309391.56 (J) S = 59.13 (J/K) V = 9.72 (cc) Cp = 31.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.34 | 0.51 | 14.56 | 0.18 | 0.00 | 0.63 | 0.03 | 0.17 | 0.00 | 0.00 | 1.60 | 2.55 | 5.66 | 0.43 | 4.33 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.94 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.13Fe"0.59Mg0.27)3Al2Si3O12
G = -93642.41 (J) H = -78795.21 (J) S = 13.46 (J/K) V = 1.76 (cc) Cp = 7.52 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.18 | 13.42 | 27.40 |

orthopyroxene mass = 6.79 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.93Mg0.97Fe'"0.01Ti0.00Al0.12Si1.93O6
G = -89425.69 (J) H = -74445.61 (J) S = 13.58 (J/K) V = 1.92 (cc) Cp = 7.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.52 | 97.30 | 93.17 | 5.29 | -5.04 | 6.49 | 0.33 |

feldspar mass = 41.12 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.70Ca0.19Al1.19Si2.81O8
G = -665580.47 (J) H = -566913.19 (J) S = 89.44 (J/K) V = 15.79 (cc) Cp = 49.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.70 | 19.29 | 11.01 |

quartz mass = 21.11 (gm) density = 2.56 (gm/cc)
SiO2
G = -343757.30 (J) H = -296056.60 (J) S = 43.24 (J/K) V = 8.25 (cc) Cp = 24.67 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.11Fe'"0.13Al0.11Ti0.88O3
G = -7830.39 (J) H = -6215.81 (J) S = 1.46 (J/K) V = 0.17 (cc) Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.96 | 6.53 | 76.34 | 0.61 | 5.56 |

Total solids mass = 76.75 (gm) density = 2.75 (gm/cc)
G = -1200236.26 (J) H = -1022426.42 (J) S = 161.18 (J/K) V = 27.90 (cc) Cp = 90.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1574853.31 (J) H = -1331817.97 (J) S = 220.31 (J/K) V = 37.62 (cc) Cp = 121.58 (J/K)

Oxygen delta moles = -0.00185936 delta grams = -0.0594973
G = 457.71 (J) H = -48.93 (J) S = -0.46 (J/K) V = -170.54 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 820.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.08 COH = 1.21 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 21.91 (gm) density = 2.38 (gm/cc) viscosity = 5.90 (log 10 poise) (analysis in wt %)
G = -353874.37 (J) H = -292682.76 (J) S = 55.98 (J/K) V = 9.21 (cc) Cp = 29.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.19 | 0.47 | 14.45 | 0.16 | 0.00 | 0.56 | 0.03 | 0.17 | 0.00 | 0.00 | 1.61 | 2.58 | 5.72 | 0.46 | 4.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.77 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.59Mg0.28)3Al2Si3O12
G = -104777.70 (J) H = -88398.32 (J) S = 14.98 (J/K) V = 1.97 (cc) Cp = 8.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.64 | 13.79 | 27.57 |

orthopyroxene mass = 6.26 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg0.99Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -82802.18 (J) H = -69159.11 (J) S = 12.48 (J/K) V = 1.77 (cc) Cp = 7.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.12 | 97.22 | 91.24 | 5.03 | -4.80 | 6.09 | 0.33 |

feldspar mass = 41.54 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.70Ca0.19Al1.19Si2.81O8
G = -671226.52 (J) H = -572938.05 (J) S = 89.91 (J/K) V = 15.96 (cc) Cp = 50.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.56 | 18.74 | 11.70 |

quartz mass = 21.63 (gm) density = 2.56 (gm/cc)
SiO2
G = -351895.51 (J) H = -303698.96 (J) S = 44.09 (J/K) V = 8.46 (cc) Cp = 25.26 (J/K)

rhm-oxide mass = 0.82 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.11Fe'"0.12Al0.11Ti0.88O3
G = -8060.70 (J) H = -6420.84 (J) S = 1.50 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.24 | 6.24 | 76.49 | 0.65 | 5.39 |

Total solids mass = 78.03 (gm) density = 2.75 (gm/cc)
G = -1218762.61 (J) H = -1040615.28 (J) S = 162.97 (J/K) V = 28.34 (cc) Cp = 91.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1572636.98 (J) H = -1333298.04 (J) S = 218.94 (J/K) V = 37.55 (cc) Cp = 121.31 (J/K)

Oxygen delta moles = -0.0018975 delta grams = -0.0607177
G = 462.42 (J) H = -49.27 (J) S = -0.47 (J/K) V = -172.46 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 810.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.09 COH = 1.18 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 20.21 (gm) density = 2.37 (gm/cc) viscosity = 5.73 (log 10 poise) (analysis in wt %)
G = -326510.40 (J) H = -270273.75 (J) S = 51.92 (J/K) V = 8.52 (cc) Cp = 27.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.98 | 0.43 | 14.29 | 0.15 | 0.00 | 0.52 | 0.04 | 0.17 | 0.00 | 0.00 | 1.65 | 2.72 | 5.58 | 0.50 | 4.97 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.63 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.58Mg0.28)3Al2Si3O12
G = -116450.97 (J) H = -98507.46 (J) S = 16.57 (J/K) V = 2.19 (cc) Cp = 9.33 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.03 | 14.06 | 27.91 |

orthopyroxene mass = 5.70 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.89Mg1.02Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -75689.51 (J) H = -63432.36 (J) S = 11.32 (J/K) V = 1.62 (cc) Cp = 6.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.42 | 97.15 | 88.98 | 4.80 | -4.57 | 5.72 | 0.34 |

feldspar mass = 40.69 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.70Ca0.19Al1.19Si2.81O8
G = -656706.60 (J) H = -561799.19 (J) S = 87.62 (J/K) V = 15.62 (cc) Cp = 49.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.06 | 18.70 | 11.23 |

feldspar mass = 1.58 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -24816.26 (J) H = -21186.77 (J) S = 3.35 (J/K) V = 0.62 (cc) Cp = 1.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.18 | 2.14 | 64.68 |

quartz mass = 22.28 (gm) density = 2.56 (gm/cc)
SiO2
G = -361908.89 (J) H = -312991.62 (J) S = 45.16 (J/K) V = 8.71 (cc) Cp = 25.98 (J/K)

rhm-oxide mass = 0.85 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.12Fe'"0.12Al0.10Ti0.89O3
G = -8354.29 (J) H = -6678.35 (J) S = 1.55 (J/K) V = 0.18 (cc) Cp = 0.79 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.59 | 5.93 | 76.56 | 0.68 | 5.25 |

Total solids mass = 79.73 (gm) density = 2.75 (gm/cc)
G = -1243926.51 (J) H = -1064595.75 (J) S = 165.56 (J/K) V = 28.95 (cc) Cp = 93.72 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1570436.91 (J) H = -1334869.50 (J) S = 217.48 (J/K) V = 37.48 (cc) Cp = 121.00 (J/K)

Oxygen delta moles = -0.00193165 delta grams = -0.0618106
G = 465.98 (J) H = -49.47 (J) S = -0.48 (J/K) V = -173.96 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 18.61 (gm) density = 2.36 (gm/cc) viscosity = 5.55 (log 10 poise) (analysis in wt %)
G = -300822.39 (J) H = -249178.48 (J) S = 48.12 (J/K) V = 7.88 (cc) Cp = 25.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.71 | 0.39 | 14.14 | 0.14 | 0.00 | 0.48 | 0.04 | 0.17 | 0.00 | 0.00 | 1.69 | 2.87 | 5.43 | 0.54 | 5.40 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.42 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.57Mg0.28)3Al2Si3O12
G = -127208.68 (J) H = -107891.03 (J) S = 18.00 (J/K) V = 2.39 (cc) Cp = 10.19 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.43 | 14.33 | 28.25 |

orthopyroxene mass = 5.19 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.05Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -69172.09 (J) H = -58164.44 (J) S = 10.26 (J/K) V = 1.48 (cc) Cp = 5.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.76 | 97.09 | 86.73 | 4.58 | -4.36 | 5.38 | 0.34 |

feldspar mass = 39.94 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.71Ca0.19Al1.19Si2.81O8
G = -643938.24 (J) H = -552104.51 (J) S = 85.57 (J/K) V = 15.33 (cc) Cp = 48.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.56 | 18.65 | 10.79 |

feldspar mass = 3.01 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -47076.85 (J) H = -40282.01 (J) S = 6.33 (J/K) V = 1.18 (cc) Cp = 3.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.46 | 1.98 | 65.56 |

quartz mass = 22.89 (gm) density = 2.56 (gm/cc)
SiO2
G = -371430.26 (J) H = -321893.15 (J) S = 46.16 (J/K) V = 8.95 (cc) Cp = 26.67 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.12Fe'"0.11Al0.10Ti0.89O3
G = -8605.03 (J) H = -6903.07 (J) S = 1.59 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.94 | 5.63 | 76.61 | 0.71 | 5.12 |

Total solids mass = 81.32 (gm) density = 2.75 (gm/cc)
G = -1267431.15 (J) H = -1087238.21 (J) S = 167.91 (J/K) V = 29.53 (cc) Cp = 95.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1568253.54 (J) H = -1336416.68 (J) S = 216.03 (J/K) V = 37.41 (cc) Cp = 120.72 (J/K)

Oxygen delta moles = -0.00196175 delta grams = -0.0627737
G = 468.41 (J) H = -49.55 (J) S = -0.48 (J/K) V = -175.04 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 790.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.11 COH = 1.11
IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 17.10 (gm) density = 2.35 (gm/cc) viscosity = 5.34 (log 10 poise) (analysis in wt %)
G = -276450.45 (J) H = -229101.36 (J) S = 44.54 (J/K) V = 7.27 (cc) Cp = 23.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.37 | 0.35 | 13.99 | 0.14 | 0.00 | 0.44 | 0.04 | 0.17 | 0.00 | 0.00 | 1.73 | 3.05 | 5.25 | 0.59 | 5.88 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.15 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.57Mg0.29)3Al2Si3O12
G = -137195.66 (J) H = -116665.79 (J) S = 19.31 (J/K) V = 2.58 (cc) Cp = 10.98 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.83 | 14.58 | 28.59 |

orthopyroxene mass = 4.72 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.84Mg1.07Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -63152.89 (J) H = -53279.02 (J) S = 9.29 (J/K) V = 1.35 (cc) Cp = 5.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.11 | 97.03 | 84.47 | 4.36 | -4.15 | 5.05 | 0.35 |

feldspar mass = 39.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -632567.79 (J) H = -543560.91 (J) S = 83.72 (J/K) V = 15.07 (cc) Cp = 47.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.06 | 18.57 | 10.37 |

feldspar mass = 4.31 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -67310.20 (J) H = -57724.21 (J) S = 9.02 (J/K) V = 1.69 (cc) Cp = 5.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.75 | 1.83 | 66.42 |

quartz mass = 23.49 (gm) density = 2.56 (gm/cc)
SiO2
G = -380589.94 (J) H = -330513.95 (J) S = 47.10 (J/K) V = 9.18 (cc) Cp = 27.33 (J/K)

rhm-oxide mass = 0.90 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.12Fe'"0.11Al0.10Ti0.90O3
G = -8819.51 (J) H = -7099.93 (J) S = 1.62 (J/K) V = 0.20 (cc) Cp = 0.83 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.30 | 5.35 | 76.63 | 0.73 | 4.99 |

Total solids mass = 82.84 (gm) density = 2.75 (gm/cc)
G = -1289636.00 (J) H = -1108843.81 (J) S = 170.05 (J/K) V = 30.08 (cc) Cp = 97.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1566086.44 (J) H = -1337945.17 (J) S = 214.59 (J/K) V = 37.34 (cc) Cp = 120.48 (J/K)

Oxygen delta moles = -0.00198843 delta grams = -0.0636274
G = 469.89 (J) H = -49.53 (J) S = -0.49 (J/K) V = -175.76 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 780.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = -0.12  COH = 1.07
IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 14.01 (gm)  density = 2.34 (gm/cc)  viscosity = 4.95 (log 10 poise)  (analysis in wt %)
G = -226560.93 (J)  H = -187575.24 (J)  S = 37.02 (J/K)  V = 5.99 (cc)  Cp = 19.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.04 | 0.28 | 13.15 | 0.16 | 0.00 | 0.49 | 0.05 | 0.15 | 0.00 | 0.00 | 1.89 | 3.63 | 4.87 | 0.72 | 6.57 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 12.97 (gm)  density = 3.95 (gm/cc)  (analysis in mole %)
(Ca0.15Fe"0.59Mg0.26)3Al2Si3O12
G = -173802.40 (J)  H = -148045.18 (J)  S = 24.46 (J/K)  V = 3.29 (cc)  Cp = 13.94 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.60 | 15.39 | 26.01 |

orthopyroxene  mass = 1.33 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg1.02Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -17604.50 (J)  H = -14861.53 (J)  S = 2.60 (J/K)  V = 0.38 (cc)  Cp = 1.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.54 | 97.13 | 89.94 | 4.17 | -4.00 | 4.95 | 0.34 |

biotite  mass = 1.96 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -31143.64 (J)  H = -26637.67 (J)  S = 4.28 (J/K)  V = 0.71 (cc)  Cp = 2.48 (J/K)

| annite | phlogopite |
|---|---|
| 3.46 | 96.54 |

feldspar  mass = 38.70 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.10Na0.72Ca0.17Al1.17Si2.83O8
G = -622339.42 (J)  H = -535881.69 (J)  S = 82.09 (J/K)  V = 14.86 (cc)  Cp = 47.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.34 | 17.25 | 10.41 |

feldspar  mass = 4.34 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -67685.89 (J)  H = -58174.41 (J)  S = 9.03 (J/K)  V = 1.71 (cc)  Cp = 5.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.01 | 1.66 | 66.32 |

quartz  mass = 25.68 (gm)  density = 2.56 (gm/cc)
SiO2
G = -415613.55 (J)  H = -361673.96 (J)  S = 51.22 (J/K)  V = 10.04 (cc)  Cp = 29.84 (J/K)

rhm-oxide  mass = 0.94 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.78Mg0.11Fe'"0.11Al0.09Ti0.90O3
G = -9191.26 (J)  H = -7409.38 (J)  S = 1.69 (J/K)  V = 0.20 (cc)  Cp = 0.87 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.09 | 5.64 | 77.98 | 0.76 | 4.54 |

Total solids  mass = 85.92 (gm)  density = 2.76 (gm/cc)

G = -1337380.66 (J)  H = -1152683.83 (J)  S = 175.38 (J/K)  V = 31.19 (cc)  Cp = 100.81 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.69 (gm/cc)
G = -1563941.58 (J)  H = -1340259.07 (J)  S = 212.39 (J/K)  V = 37.18 (cc)  Cp = 119.94 (J/K)

Oxygen  delta moles = -0.00200748  delta grams = -0.0642369
G = 469.46 (J)  H = -49.30 (J)  S = -0.49 (J/K)  V = -175.78 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 770.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.54  delta HM = -5.16  NNO = 0.00  QFM = -0.14  COH = 1.04
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid  mass = 12.15 (gm)  density = 2.32 (gm/cc)  viscosity = 4.63 (log 10 poise)  (analysis in wt %)
G = -196601.12 (J)  H = -162683.70 (J)  S = 32.51 (J/K)  V = 5.23 (cc)  Cp = 16.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.40 | 0.23 | 12.83 | 0.17 | 0.00 | 0.50 | 0.05 | 0.14 | 0.00 | 0.00 | 2.00 | 3.98 | 4.60 | 0.83 | 7.28 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.02 (gm)  density = 3.95 (gm/cc)  (analysis in mole %)
(Ca0.16Fe"0.60Mg0.24)3Al2Si3O12
G = -186870.69 (J)  H = -159481.36 (J)  S = 26.26 (J/K)  V = 3.55 (cc)  Cp = 15.02 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.78 | 15.81 | 24.41 |

biotite  mass = 2.83 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -44701.72 (J)  H = -38311.16 (J)  S = 6.13 (J/K)  V = 1.02 (cc)  Cp = 3.56 (J/K)

| annite | phlogopite |
|---|---|
| 4.03 | 95.97 |

feldspar  mass = 38.43 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -617309.74 (J)  H = -532704.70 (J)  S = 81.11 (J/K)  V = 14.76 (cc)  Cp = 46.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.09 | 16.77 | 10.14 |

feldspar  mass = 4.75 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -73932.81 (J)  H = -63684.84 (J)  S = 9.82 (J/K)  V = 1.87 (cc)  Cp = 5.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.57 | 1.52 | 66.90 |

quartz  mass = 26.79 (gm)  density = 2.56 (gm/cc)
SiO2
G = -433046.94 (J)  H = -377619.60 (J)  S = 53.13 (J/K)  V = 10.48 (cc)  Cp = 31.09 (J/K)

rhm-oxide  mass = 0.97 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)

Mn0.01Fe"0.79Mg0.10Fe'"0.11Al0.09Ti0.90O3
G = -9355.07 (J) H = -7558.93 (J) S = 1.72 (J/K) V = 0.21 (cc) Cp = 0.89 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.33 | 5.61 | 78.92 | 0.78 | 4.36 |

Total solids mass = 87.79 (gm) density = 2.75 (gm/cc)
G = -1365216.96 (J) H = -1179360.59 (J) S = 178.17 (J/K) V = 31.88 (cc) Cp = 103.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1561818.08 (J) H = -1342044.29 (J) S = 210.68 (J/K) V = 37.10 (cc) Cp = 119.71 (J/K)

Oxygen delta moles = -0.00202455 delta grams = -0.0647831
G = 468.49 (J) H = -49.01 (J) S = -0.50 (J/K) V = -175.59 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.94 (gm) density = 2.31 (gm/cc) viscosity = 4.36 (log 10 poise) (analysis in wt %)
G = -177208.98 (J) H = -146601.91 (J) S = 29.63 (J/K) V = 4.73 (cc) Cp = 15.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.48 | 0.21 | 12.98 | 0.16 | 0.00 | 0.47 | 0.06 | 0.12 | 0.00 | 0.00 | 2.07 | 4.12 | 4.41 | 0.92 | 8.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.88 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.60Mg0.24)3Al2Si3O12
G = -184252.25 (J) H = -157573.66 (J) S = 25.82 (J/K) V = 3.50 (cc) Cp = 14.83 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.50 | 15.93 | 23.57 |

biotite mass = 2.99 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -47267.87 (J) H = -40599.86 (J) S = 6.45 (J/K) V = 1.08 (cc) Cp = 3.77 (J/K)

| annite | phlogopite |
|---|---|
| 4.22 | 95.78 |

feldspar mass = 38.44 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -616796.52 (J) H = -533456.93 (J) S = 80.67 (J/K) V = 14.75 (cc) Cp = 47.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.39 | 17.00 | 9.61 |

feldspar mass = 5.46 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -84955.78 (J) H = -73343.79 (J) S = 11.24 (J/K) V = 2.15 (cc) Cp = 6.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.57 | 1.41 | 68.02 |

quartz mass = 27.24 (gm) density = 2.56 (gm/cc)
SiO2
G = -439797.60 (J) H = -384292.02 (J) S = 53.72 (J/K) V = 10.65 (cc) Cp = 31.58 (J/K)

rhm-oxide mass = 0.98 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.80Mg0.10Fe'"0.11Al0.09Ti0.90O3
G = -9430.85 (J) H = -7643.43 (J) S = 1.73 (J/K) V = 0.21 (cc) Cp = 0.90 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.92 | 5.33 | 79.56 | 0.78 | 4.40 |

Total solids mass = 89.00 (gm) density = 2.75 (gm/cc)
G = -1382500.88 (J) H = -1196909.69 (J) S = 179.64 (J/K) V = 32.35 (cc) Cp = 104.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1559709.86 (J) H = -1343511.60 (J) S = 209.26 (J/K) V = 37.08 (cc) Cp = 119.69 (J/K)

Oxygen delta moles = -0.00204082 delta grams = -0.0653037
G = 467.26 (J) H = -48.69 (J) S = -0.50 (J/K) V = -175.30 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 750.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.16 COH = 0.97 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 9.74 (gm) density = 2.30 (gm/cc) viscosity = 4.03 (log 10 poise) (analysis in wt %)
G = -158154.20 (J) H = -130726.72 (J) S = 26.81 (J/K) V = 4.24 (cc) Cp = 13.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.30 | 0.18 | 13.15 | 0.15 | 0.00 | 0.44 | 0.07 | 0.11 | 0.00 | 0.00 | 2.16 | 4.29 | 4.18 | 1.03 | 8.94 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.76 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.61Mg0.23)3Al2Si3O12
G = -181881.48 (J) H = -155872.22 (J) S = 25.42 (J/K) V = 3.47 (cc) Cp = 14.65 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.16 | 16.01 | 22.83 |

biotite mass = 3.14 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -49484.80 (J) H = -42598.61 (J) S = 6.73 (J/K) V = 1.13 (cc) Cp = 3.94 (J/K)

| annite | phlogopite |
|---|---|
| 4.35 | 95.65 |

feldspar mass = 38.46 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.17Al1.17Si2.83O8
G = -616553.54 (J) H = -534441.70 (J) S = 80.25 (J/K) V = 14.75 (cc) Cp = 47.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.66 | 17.22 | 9.12 |

feldspar mass = 6.16 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -95522.31 (J) H = -82650.38 (J) S = 12.58 (J/K) V = 2.42 (cc) Cp = 7.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.59 | 1.30 | 69.11 |

quartz mass = 27.69 (gm) density = 2.56 (gm/cc)
SiO2
G = -446526.27 (J) H = -390968.14 (J) S = 54.30 (J/K) V = 10.83 (cc) Cp = 32.06 (J/K)

rhm-oxide mass = 0.99 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.80Mg0.10Fe'"0.10Al0.09Ti0.91O3
G = -9493.56 (J) H = -7718.04 (J) S = 1.74 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.56 | 5.05 | 80.16 | 0.79 | 4.45 |

Total solids mass = 90.19 (gm) density = 2.75 (gm/cc)
G = -1399461.96 (J) H = -1214249.10 (J) S = 181.02 (J/K) V = 32.81 (cc) Cp = 106.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1557616.16 (J) H = -1344975.81 (J) S = 207.83 (J/K) V = 37.05 (cc) Cp = 119.75 (J/K)

Oxygen delta moles = -0.00205663 delta grams = -0.0658096
G = 465.85 (J) H = -48.35 (J) S = -0.50 (J/K) V = -174.95 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 740.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.17 COH = 0.93 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 8.57 (gm) density = 2.28 (gm/cc) viscosity = 3.64 (log 10 poise) (analysis in wt %)
G = -139521.02 (J) H = -115135.39 (J) S = 24.07 (J/K) V = 3.76 (cc) Cp = 12.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.81 | 0.15 | 13.32 | 0.15 | 0.00 | 0.42 | 0.07 | 0.09 | 0.00 | 0.00 | 2.29 | 4.52 | 3.90 | 1.17 | 10.10 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.65 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.62Mg0.22)3Al2Si3O12
G = -179826.57 (J) H = -154437.33 (J) S = 25.06 (J/K) V = 3.44 (cc) Cp = 14.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.75 | 16.04 | 22.21 |

biotite mass = 3.26 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -51299.99 (J) H = -44260.70 (J) S = 6.95 (J/K) V = 1.18 (cc) Cp = 4.09 (J/K)

| annite | phlogopite |
|---|---|
| 4.42 | 95.58 |

feldspar mass = 38.51 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.17Al1.17Si2.83O8
G = -616652.66 (J) H = -535723.60 (J) S = 79.88 (J/K) V = 14.76 (cc) Cp = 47.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.92 | 17.44 | 8.64 |

feldspar mass = 6.82 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -105633.17 (J) H = -91602.68 (J) S = 13.85 (J/K) V = 2.68 (cc) Cp = 8.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.62 | 1.21 | 70.17 |

quartz mass = 28.13 (gm) density = 2.59 (gm/cc)
SiO2
G = -453056.00 (J) H = -398146.92 (J) S = 54.20 (J/K) V = 10.85 (cc) Cp = 37.92 (J/K)

rhm-oxide mass = 0.99 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.81Mg0.09Fe'"0.10Al0.09Ti0.91O3
G = -9542.45 (J) H = -7782.09 (J) S = 1.74 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.24 | 4.76 | 80.71 | 0.79 | 4.50 |

Total solids mass = 91.36 (gm) density = 2.76 (gm/cc)
G = -1416010.84 (J) H = -1231953.31 (J) S = 181.67 (J/K) V = 33.12 (cc) Cp = 113.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1555531.86 (J) H = -1347088.71 (J) S = 205.74 (J/K) V = 36.88 (cc) Cp = 125.33 (J/K)

Oxygen delta moles = -0.00207216 delta grams = -0.0663067
G = 464.31 (J) H = -47.99 (J) S = -0.51 (J/K) V = -174.55 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 730.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.18 COH = 0.89
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 7.22 (gm) density = 2.25 (gm/cc) viscosity = 3.04 (log 10 poise) (analysis in wt %)
G = -118103.72 (J) H = -97072.65 (J) S = 20.97 (J/K) V = 3.21 (cc) Cp = 10.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.33 | 0.11 | 13.57 | 0.15 | 0.00 | 0.41 | 0.09 | 0.08 | 0.00 | 0.00 | 2.51 | 4.93 | 3.50 | 1.39 | 11.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.55 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.62Mg0.22)3Al2Si3O12
G = -177905.12 (J) H = -153110.15 (J) S = 24.72 (J/K) V = 3.41 (cc) Cp = 14.37 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.33 | 15.97 | 21.69 |

biotite mass = 3.36 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -52785.80 (J) H = -45646.24 (J) S = 7.12 (J/K) V = 1.21 (cc) Cp = 4.21 (J/K)

| annite | phlogopite |
|---|---|
| 4.42 | 95.58 |

feldspar mass = 38.59 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.18Al1.18Si2.82O8
G = -617247.31 (J) H = -537442.51 (J) S = 79.55 (J/K) V = 14.78 (cc) Cp = 48.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.12 | 17.71 | 8.17 |

feldspar mass = 7.55 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -116699.50 (J) H = -101424.65 (J) S = 15.23 (J/K) V = 2.97 (cc) Cp = 8.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.63 | 1.12 | 71.25 |

quartz mass = 28.67 (gm) density = 2.60 (gm/cc)
SiO2
G = -461138.20 (J) H = -406118.01 (J) S = 54.85 (J/K) V = 11.04 (cc) Cp = 38.31 (J/K)

rhm-oxide mass = 1.00 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.81Mg0.09Fe'"0.09Al0.09Ti0.91O3
G = -9594.70 (J) H = -7849.70 (J) S = 1.74 (J/K) V = 0.22 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.96 | 4.46 | 81.19 | 0.77 | 4.61 |

Total solids mass = 92.71 (gm) density = 2.76 (gm/cc)
G = -1435370.63 (J) H = -1251591.25 (J) S = 183.20 (J/K) V = 33.62 (cc) Cp = 115.13 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1553474.35 (J) H = -1348663.90 (J) S = 204.17 (J/K) V = 36.83 (cc) Cp = 125.48 (J/K)

Oxygen delta moles = -0.00208743 delta grams = -0.0667954
G = 462.64 (J) H = -47.62 (J) S = -0.51 (J/K) V = -174.10 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 720.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = -0.20 COH = 0.85 IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 5.75 (gm) density = 2.20 (gm/cc) viscosity = 2.18 (log 10 poise) (analysis in wt %)
G = -94699.62 (J) H = -77224.98 (J) S = 17.60 (J/K) V = 2.61 (cc) Cp = 8.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.23 | 0.08 | 13.84 | 0.15 | 0.00 | 0.41 | 0.11 | 0.07 | 0.00 | 0.00 | 2.88 | 5.61 | 2.92 | 1.75 | 14.94 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.47 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.63Mg0.21)3Al2Si3O12
G = -176320.79 (J) H = -152068.47 (J) S = 24.42 (J/K) V = 3.38 (cc) Cp = 14.25 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.86 | 15.77 | 21.37 |

biotite mass = 3.42 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -53724.55 (J) H = -46565.87 (J) S = 7.21 (J/K) V = 1.23 (cc) Cp = 4.28 (J/K)

| annite | phlogopite |
|---|---|
| 4.31 | 95.69 |

feldspar mass = 38.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.18Al1.18Si2.82O8
G = -618948.52 (J) H = -540135.18 (J) S = 79.36 (J/K) V = 14.83 (cc) Cp = 49.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.27 | 18.01 | 7.72 |

feldspar mass = 8.30 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -128045.36 (J) H = -111533.13 (J) S = 16.63 (J/K) V = 3.26 (cc) Cp = 9.90 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.65 | 1.03 | 72.32 |

quartz mass = 29.25 (gm) density = 2.60 (gm/cc)
SiO2
G = -470053.18 (J) H = -414849.82 (J) S = 55.58 (J/K) V = 11.25 (cc) Cp = 38.76 (J/K)

rhm-oxide mass = 1.01 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.82Mg0.09Fe'"0.08Al0.10Ti0.91O3
G = -9640.62 (J) H = -7913.15 (J) S = 1.74 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.75 | 4.15 | 81.60 | 0.74 | 4.76 |

Total solids mass = 94.19 (gm) density = 2.76 (gm/cc)
G = -1456733.01 (J) H = -1273065.62 (J) S = 184.93 (J/K) V = 34.17 (cc) Cp = 117.35 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.72 (gm/cc)
G = -1551432.63 (J) H = -1350290.61 (J) S = 202.53 (J/K) V = 36.78 (cc) Cp = 125.81 (J/K)

Oxygen delta moles = -0.00210318 delta grams = -0.0672991
G = 461.01 (J) H = -47.24 (J) S = -0.51 (J/K) V = -173.67 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 710.00 (C) P = 7.000 (kbars) log(10) f O2 = -16.00 delta HM = -5.22 NNO = 0.00 QFM = -0.21 COH = 0.81
IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid mass = 4.48 (gm) density = 2.14 (gm/cc) viscosity = 1.25 (log 10 poise) (analysis in wt %)
G = -74535.97 (J) H = -60147.89 (J) S = 14.63 (J/K) V = 2.09 (cc) Cp = 6.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51.81 | 0.05 | 14.04 | 0.16 | 0.00 | 0.41 | 0.15 | 0.06 | 0.00 | 0.00 | 3.39 | 6.41 | 2.32 | 2.24 | 18.96 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.41 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.63Mg0.21)3Al2Si3O12
G = -175043.42 (J) H = -151289.16 (J) S = 24.16 (J/K) V = 3.36 (cc) Cp = 14.16 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.32 | 15.53 | 21.14 |

biotite mass = 3.46 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -54328.38 (J) H = -47199.60 (J) S = 7.25 (J/K) V = 1.25 (cc) Cp = 4.33 (J/K)

| annite | phlogopite |
|---|---|
| 4.13 | 95.87 |

feldspar mass = 38.83 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.74Ca0.18Al1.18Si2.82O8
G = -619883.81 (J) H = -542170.22 (J) S = 79.05 (J/K) V = 14.86 (cc) Cp = 50.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.40 | 18.32 | 7.28 |

feldspar mass = 8.88 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.73Na0.26Ca0.01Al1.01Si2.99O8
G = -136735.84 (J) H = -119367.64 (J) S = 17.67 (J/K) V = 3.49 (cc) Cp = 10.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 25.67 | 0.96 | 73.37 |

quartz mass = 29.76 (gm) density = 2.60 (gm/cc)
SiO2
G = -477654.49 (J) H = -422448.46 (J) S = 56.15 (J/K) V = 11.43 (cc) Cp = 39.11 (J/K)

leucite mass = 0.10 (gm) density = 2.27 (gm/cc) (analysis in mole %)
K0.01Na0.99AlSi2O5.05(OH)1.89
G = -1563.27 (J) H = -1327.71 (J) S = 0.24 (J/K) V = 0.04 (cc) Cp = 0.15 (J/K)

| leucite | analcime | na-leucite |
|---|---|---|
| 0.53 | 94.67 | 4.80 |

rhm-oxide mass = 1.01 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.82Mg0.09Fe'"0.08Al0.10Ti0.91O3
G = -9662.36 (J) H = -7957.19 (J) S = 1.73 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.58 | 3.86 | 81.93 | 0.70 | 4.94 |

Total solids mass = 95.45 (gm) density = 2.76 (gm/cc)
G = -1474871.57 (J) H = -1291760.00 (J) S = 186.25 (J/K) V = 34.64 (cc) Cp = 119.50 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.72 (gm/cc)
G = -1549407.53 (J) H = -1351907.89 (J) S = 200.88 (J/K) V = 36.73 (cc) Cp = 126.33 (J/K)

Oxygen delta moles = -0.00211871 delta grams = -0.0677961
G = 459.26 (J) H = -46.85 (J) S = -0.51 (J/K) V = -173.19 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 700.00 (C) P = 7.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = -0.22 COH = 0.77
IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 2.39 (gm) density = 2.11 (gm/cc) viscosity = 0.56 (log 10 poise) (analysis in wt %)
G = -39867.61 (J) H = -32029.68 (J) S = 8.05 (J/K) V = 1.13 (cc) Cp = 3.78 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45.24 | 0.04 | 14.12 | 0.13 | 0.00 | 0.33 | 0.24 | 0.05 | 0.00 | 0.00 | 5.68 | 6.20 | 2.00 | 4.21 | 21.77 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.66 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.63Mg0.21)3Al2Si3O12
G = -178448.88 (J) H = -154635.11 (J) S = 24.47 (J/K) V = 3.43 (cc) Cp = 14.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.63 | 16.22 | 21.16 |

biotite mass = 3.39 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -53154.88 (J) H = -46297.87 (J) S = 7.05 (J/K) V = 1.22 (cc) Cp = 4.23 (J/K)

| annite | phlogopite |
|---|---|
| 3.47 | 96.53 |

feldspar mass = 34.04 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.73Ca0.20Al1.20Si2.80O8
G = -543054.89 (J) H = -476125.95 (J) S = 68.78 (J/K) V = 13.00 (cc) Cp = 44.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.07 | 20.45 | 6.48 |

feldspar mass = 9.97 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.75Na0.24Ca0.01Al1.01Si2.99O8
G = -153257.13 (J) H = -134092.62 (J) S = 19.69 (J/K) V = 3.92 (cc) Cp = 11.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 23.73 | 0.93 | 75.35 |

quartz mass = 31.11 (gm) density = 2.61 (gm/cc)
SiO2
G = -498740.20 (J) H = -442021.56 (J) S = 58.28 (J/K) V = 11.93 (cc) Cp = 40.54 (J/K)

leucite mass = 4.36 (gm) density = 2.27 (gm/cc) (analysis in mole %)
K0.00Na1.00AlSi2O5.05(OH)1.90
G = -71183.27 (J) H = -60615.56 (J) S = 10.86 (J/K) V = 1.92 (cc) Cp = 6.74 (J/K)

| leucite | analcime | na-leucite |
|---|---|---|
| 0.49 | 95.02 | 4.49 |

rhm-oxide mass = 1.01 (gm) density = 4.63 (gm/cc) (analysis in mole %)

Mn0.01Fe"0.82Mg0.09Fe'"0.07Al0.11Ti0.91O3
G = -9688.24 (J) H = -8008.69 (J) S = 1.73 (J/K) V = 0.22 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.77 | 3.42 | 81.66 | 0.87 | 5.28 |

Total solids mass = 97.54 (gm) density = 2.74 (gm/cc)
G = -1507527.49 (J) H = -1321797.37 (J) S = 190.85 (J/K) V = 35.63 (cc) Cp = 123.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.72 (gm/cc)
G = -1547395.10 (J) H = -1353827.05 (J) S = 198.91 (J/K

**********----------**********
Title: f8p2

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 4.07 (log 10 poise)  (analysis in wt %)
G = -1691202.74 (J)  H = -1248324.37 (J)  S = 281.52 (J/K)  V = 40.28 (cc)  Cp = 143.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.70 | 0.00 | 3.80 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.07 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1691202.74 (J)  H = -1248324.37 (J)  S = 281.52 (J/K)  V = 40.28 (cc)  Cp = 143.20 (J/K)

Oxygen  delta moles = -7.97973e-17  delta grams = -2.55342e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 4.13 (log 10 poise)  (analysis in wt %)
G = -1688393.17 (J)  H = -1249757.26 (J)  S = 280.61 (J/K)  V = 40.25 (cc)  Cp = 143.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.70 | 0.00 | 3.80 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1688393.17 (J)  H = -1249757.26 (J)  S = 280.61 (J/K)  V = 40.25 (cc)  Cp = 143.19 (J/K)

Oxygen  delta moles = 2.02432e-06  delta grams = 6.47757e-05
G = -0.73 (J)  H = 0.09 (J)  S = 0.00 (J/K)  V = 0.26 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 4.19 (log 10 poise)  (analysis in wt %)
G = -1685592.90 (J)  H = -1251190.20 (J)  S = 279.69 (J/K)  V = 40.22 (cc)  Cp = 143.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.70 | 0.00 | 3.80 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.19 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1685592.90 (J)  H = -1251190.20 (J)  S = 279.69 (J/K)  V = 40.22 (cc)  Cp = 143.18 (J/K)

Oxygen  delta moles = 4.33772e-06  delta grams = 0.000138802
G = -1.56 (J)  H = 0.18 (J)  S = 0.00 (J/K)  V = 0.56 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -1682802.02 (J)  H = -1252623.19 (J)  S = 278.77 (J/K)  V = 40.19 (cc)  Cp = 143.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.70 | 0.00 | 3.80 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1682802.02 (J)  H = -1252623.19 (J)  S = 278.77 (J/K)  V = 40.19 (cc)  Cp = 143.17 (J/K)

Oxygen  delta moles = 6.94826e-06  delta grams = 0.000222336
G = -2.48 (J)  H = 0.29 (J)  S = 0.00 (J/K)  V = 0.89 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1680020.57 (J)  H = -1254056.22 (J)  S = 277.84 (J/K)  V = 40.16 (cc)  Cp = 143.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.70 | 0.00 | 3.80 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1680020.57 (J)  H = -1254056.22 (J)  S = 277.84 (J/K)  V = 40.16 (cc)  Cp = 143.17 (J/K)

Oxygen  delta moles = 9.86433e-06  delta grams = 0.000315647
G = -3.50 (J)  H = 0.41 (J)  S = 0.00 (J/K)  V = 1.26 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1677248.63 (J)  H = -1255489.32 (J)  S = 276.90 (J/K)  V = 40.13 (cc)  Cp = 143.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.71 | 0.00 | 3.80 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1677248.63 (J)  H = -1255489.32 (J)  S = 276.90 (J/K)  V = 40.13 (cc)  Cp = 143.16 (J/K)

Oxygen  delta moles = 1.30947e-05  delta grams = 0.000419013
G = -4.62 (J)  H = 0.54 (J)  S = 0.00 (J/K)  V = 1.66 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1240.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.17  COH = 2.08  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.43 (log 10 poise) (analysis in wt %)
G = -1674486.26 (J) H = -1256922.49 (J) S = 275.96 (J/K) V = 40.10 (cc) Cp = 143.15 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.71 0.00 3.80 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1674486.26 (J) H = -1256922.49 (J) S = 275.96 (J/K) V = 40.10 (cc) Cp = 143.15 (J/K)

Oxygen delta moles = 1.66484e-05 delta grams = 0.000532728
G = -5.82 (J) H = 0.68 (J) S = 0.00 (J/K) V = 2.09 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1230.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.16 COH = 2.06 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 4.49 (log 10 poise) (analysis in wt %)
G = -1671733.53 (J) H = -1258355.72 (J) S = 275.01 (J/K) V = 40.07 (cc) Cp = 143.14 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.25 0.50 14.47 0.71 0.00 3.79 0.01 1.71 0.00 0.00 2.41 3.92 2.11 0.10 1.01 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.49 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1671733.53 (J) H = -1258355.72 (J) S = 275.01 (J/K) V = 40.07 (cc) Cp = 143.14 (J/K)

Oxygen delta moles = 2.0535e-05 delta grams = 0.000657096
G = -7.13 (J) H = 0.84 (J) S = 0.01 (J/K) V = 2.57 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 4.55 (log 10 poise) (analysis in wt %)
G = -1668990.49 (J) H = -1259789.04 (J) S = 274.05 (J/K) V = 40.04 (cc) Cp = 143.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.71 | 0.00 | 3.79 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.55 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1668990.49 (J) H = -1259789.04 (J) S = 274.05 (J/K) V = 40.04 (cc) Cp = 143.13 (J/K)

Oxygen delta moles = 2.47645e-05 delta grams = 0.000792433
G = -8.54 (J) H = 1.00 (J) S = 0.01 (J/K) V = 3.07 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1666257.23 (J) H = -1261222.45 (J) S = 273.09 (J/K) V = 40.01 (cc) Cp = 143.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.71 | 0.00 | 3.79 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1666257.23 (J) H = -1261222.45 (J) S = 273.09 (J/K) V = 40.01 (cc) Cp = 143.12 (J/K)

Oxygen delta moles = 2.93471e-05 delta grams = 0.000939072
G = -10.04 (J) H = 1.17 (J) S = 0.01 (J/K) V = 3.62 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1663533.69 (J) H = -1262603.67 (J) S = 272.16 (J/K) V = 39.98 (cc) Cp = 135.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.71 | 0.00 | 3.79 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1663533.69 (J) H = -1262603.67 (J) S = 272.16 (J/K) V = 39.98 (cc) Cp = 135.48 (J/K)

Oxygen delta moles = 3.42938e-05 delta grams = 0.00109736
G = -11.64 (J) H = 1.36 (J) S = 0.01 (J/K) V = 4.20 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1660819.56 (J) H = -1263960.82 (J) S = 271.24 (J/K) V = 39.95 (cc) Cp = 135.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.25 | 0.50 | 14.47 | 0.71 | 0.00 | 3.79 | 0.01 | 1.71 | 0.00 | 0.00 | 2.41 | 3.92 | 2.11 | 0.10 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1660819.56 (J) H = -1263960.82 (J) S = 271.24 (J/K) V = 39.95 (cc) Cp = 135.45 (J/K)

Oxygen delta moles = 3.96158e-05 delta grams = 0.00126766
G = -13.35 (J) H = 1.55 (J) S = 0.01 (J/K) V = 4.82 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1180.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.13 COH = 1.97 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 99.55 (gm) density = 2.50 (gm/cc) viscosity = 4.84 (log 10 poise) (analysis in wt %)
G = -1651280.34 (J) H = -1260211.61 (J) S = 269.12 (J/K) V = 39.77 (cc) Cp = 134.73 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.32 0.50 14.53 0.71 0.00 3.74 0.01 1.60 0.00 0.00 2.42 3.94 2.12 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.45 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.52Mg1.39Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -6820.96 (J) H = -5274.42 (J) S = 1.06 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-55.53 97.04 51.95 4.10 -3.88 5.97 0.35

Total solids mass = 0.45 (gm) density = 3.33 (gm/cc)
G = -6820.96 (J) H = -5274.42 (J) S = 1.06 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

Viscosity of the System: 4.84 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1658101.30 (J) H = -1265486.03 (J) S = 270.18 (J/K) V = 39.90 (cc) Cp = 135.28 (J/K)

Oxygen delta moles = 1.96331e-05 delta grams = 0.000628237
G = -6.57 (J) H = 0.76 (J) S = 0.01 (J/K) V = 2.37 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: f8p2

T = 1170.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.12 COH = 1.95 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 99.08 (gm) density = 2.50 (gm/cc) viscosity = 4.93 (log 10 poise) (analysis in wt %)
G = -1641374.54 (J) H = -1256161.83 (J) S = 266.92 (J/K) V = 39.58 (cc) Cp = 133.97 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.40 0.51 14.59 0.70 0.00 3.67 0.01 1.49 0.00 0.00 2.43 3.96 2.13 0.10 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.92 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.54Mg1.37Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -14017.00 (J) H = -10856.75 (J) S = 2.19 (J/K) V = 0.28 (cc) Cp = 1.13 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-57.43 96.91 53.82 4.21 -3.98 6.11 0.36

Total solids mass = 0.92 (gm) density = 3.34 (gm/cc)
G = -14017.00 (J) H = -10856.75 (J) S = 2.19 (J/K) V = 0.28 (cc) Cp = 1.13 (J/K)

Viscosity of the System: 4.94 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1655391.54 (J) H = -1267018.57 (J) S = 269.11 (J/K) V = 39.85 (cc) Cp = 135.10 (J/K)

Oxygen delta moles = -4.27819e-06 delta grams = -0.000136897
G = 1.42 (J) H = -0.16 (J) S = -0.00 (J/K) V = -0.51 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1160.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.12  COH = 1.93  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.61 (gm)  density = 2.50 (gm/cc)  viscosity = 5.03 (log 10 poise)  (analysis in wt %)
G = -1631723.97 (J)  H = -1252276.38 (J)  S = 264.76 (J/K)  V = 39.39 (cc)  Cp = 133.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.48 | 0.51 | 14.64 | 0.69 | 0.00 | 3.61 | 0.01 | 1.39 | 0.00 | 0.00 | 2.44 | 3.97 | 2.14 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.39 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.56Mg1.34Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -20967.56 (J)  H = -16266.81 (J)  S = 3.28 (J/K)  V = 0.42 (cc)  Cp = 1.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.37 | 96.77 | 55.74 | 4.32 | -4.10 | 6.26 | 0.38 |

Total solids  mass = 1.39 (gm)  density = 3.35 (gm/cc)
G = -20967.56 (J)  H = -16266.81 (J)  S = 3.28 (J/K)  V = 0.42 (cc)  Cp = 1.70 (J/K)

Viscosity of the System: 5.04 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1652691.53 (J)  H = -1268543.19 (J)  S = 268.04 (J/K)  V = 39.80 (cc)  Cp = 134.92 (J/K)

Oxygen  delta moles = -2.99401e-05  delta grams = -0.000958047
G = 9.86 (J)  H = -1.14 (J)  S = -0.01 (J/K)  V = -3.57 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1150.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.11  COH = 1.91  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.15 (gm)  density = 2.50 (gm/cc)  viscosity = 5.12 (log 10 poise)  (analysis in wt %)
G = -1622309.20 (J)  H = -1248541.80 (J)  S = 262.63 (J/K)  V = 39.21 (cc)  Cp = 132.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.57 | 0.51 | 14.70 | 0.68 | 0.00 | 3.53 | 0.01 | 1.29 | 0.00 | 0.00 | 2.44 | 3.99 | 2.15 | 0.10 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.85 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.58Mg1.32Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -27692.02 (J)  H = -21518.65 (J)  S = 4.34 (J/K)  V = 0.55 (cc)  Cp = 2.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.36 | 96.64 | 57.70 | 4.44 | -4.22 | 6.41 | 0.39 |

Total solids  mass = 1.85 (gm)  density = 3.36 (gm/cc)

G = -27692.02 (J)  H = -21518.65 (J)  S = 4.34 (J/K)  V = 0.55 (cc)  Cp = 2.25 (J/K)

Viscosity of the System: 5.15 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1650001.22 (J)  H = -1270060.45 (J)  S = 266.97 (J/K)  V = 39.76 (cc)  Cp = 134.75 (J/K)

Oxygen  delta moles = -5.74571e-05  delta grams = -0.00183856
G = 18.77 (J)  H = -2.17 (J)  S = -0.01 (J/K)  V = -6.80 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1140.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.89  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.70 (gm)  density = 2.50 (gm/cc)  viscosity = 5.22 (log 10 poise)  (analysis in wt %)
G = -1613112.67 (J)  H = -1244945.82 (J)  S = 260.53 (J/K)  V = 39.03 (cc)  Cp = 131.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.65 | 0.51 | 14.75 | 0.67 | 0.00 | 3.46 | 0.01 | 1.19 | 0.00 | 0.00 | 2.45 | 4.01 | 2.16 | 0.10 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.30 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.60Mg1.30Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -34207.94 (J)  H = -26625.05 (J)  S = 5.37 (J/K)  V = 0.68 (cc)  Cp = 2.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.40 | 96.50 | 59.70 | 4.57 | -4.34 | 6.57 | 0.41 |

Total solids  mass = 2.30 (gm)  density = 3.37 (gm/cc)
G = -34207.94 (J)  H = -26625.05 (J)  S = 5.37 (J/K)  V = 0.68 (cc)  Cp = 2.79 (J/K)

Viscosity of the System: 5.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1647320.61 (J)  H = -1271570.87 (J)  S = 265.90 (J/K)  V = 39.71 (cc)  Cp = 134.58 (J/K)

Oxygen  delta moles = -8.69237e-05  delta grams = -0.00278146
G = 28.18 (J)  H = -3.25 (J)  S = -0.02 (J/K)  V = -10.21 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1130.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.87  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.26 (gm)  density = 2.50 (gm/cc)  viscosity = 5.32 (log 10 poise)  (analysis in wt %)
G = -1604118.72 (J)  H = -1241477.43 (J)  S = 258.45 (J/K)  V = 38.85 (cc)  Cp = 131.09 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

69.73 0.52 14.81 0.66 0.00 3.38 0.01 1.10 0.00 0.00 2.46 4.03 2.17 0.10 1.03 0.00 0.00 0.00 0.00

orthopyroxene mass = 2.74 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.62Mg1.27Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -40530.97 (J) H = -31597.46 (J) S = 6.37 (J/K) V = 0.81 (cc) Cp = 3.32 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-65.48 96.37 61.73 4.70 -4.48 6.74 0.42

Total solids mass = 2.74 (gm) density = 3.38 (gm/cc)
G = -40530.97 (J) H = -31597.46 (J) S = 6.37 (J/K) V = 0.81 (cc) Cp = 3.32 (J/K)

Viscosity of the System: 5.35 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1644649.69 (J) H = -1273074.89 (J) S = 264.81 (J/K) V = 39.66 (cc) Cp = 134.41 (J/K)

Oxygen delta moles = -0.000118421 delta grams = -0.00378934
G = 38.08 (J) H = -4.39 (J) S = -0.03 (J/K) V = -13.82 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: f8p2

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 96.82 (gm) density = 2.50 (gm/cc) viscosity = 5.42 (log 10 poise) (analysis in wt %)
G = -1595313.72 (J) H = -1238126.94 (J) S = 256.39 (J/K) V = 38.68 (cc) Cp = 130.41 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.82 0.52 14.86 0.65 0.00 3.29 0.01 1.02 0.00 0.00 2.46 4.05 2.18 0.10 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.17 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.64Mg1.25Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -46674.75 (J) H = -36445.95 (J) S = 7.34 (J/K) V = 0.94 (cc) Cp = 3.83 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-67.59 96.23 63.79 4.85 -4.62 6.91 0.44

Total solids mass = 3.17 (gm) density = 3.39 (gm/cc)
G = -46674.75 (J) H = -36445.95 (J) S = 7.34 (J/K) V = 0.94 (cc) Cp = 3.83 (J/K)

Viscosity of the System: 5.46 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1641988.47 (J) H = -1274572.90 (J) S = 263.73 (J/K) V = 39.61 (cc) Cp = 134.25 (J/K)

Oxygen delta moles = -0.000152015 delta grams = -0.00486429
G = 48.50 (J) H = -5.58 (J) S = -0.04 (J/K) V = -17.61 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1110.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.08  COH = 1.83  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.39 (gm)  density = 2.50 (gm/cc)  viscosity = 5.52 (log 10 poise)  (analysis in wt %)
G = -1586686.07 (J)  H = -1234886.05 (J)  S = 254.35 (J/K)  V = 38.51 (cc)  Cp = 129.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.91 | 0.52 | 14.91 | 0.63 | 0.00 | 3.21 | 0.01 | 0.94 | 0.00 | 0.00 | 2.47 | 4.06 | 2.19 | 0.10 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.60 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.66Mg1.23Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -52650.90 (J)  H = -41179.15 (J)  S = 8.29 (J/K)  V = 1.06 (cc)  Cp = 4.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.73 | 96.09 | 65.86 | 5.00 | -4.77 | 7.10 | 0.45 |

Total solids  mass = 3.60 (gm)  density = 3.40 (gm/cc)
G = -52650.90 (J)  H = -41179.15 (J)  S = 8.29 (J/K)  V = 1.06 (cc)  Cp = 4.33 (J/K)

Viscosity of the System: 5.57 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.53 (gm/cc)
G = -1639336.97 (J)  H = -1276065.20 (J)  S = 262.64 (J/K)  V = 39.57 (cc)  Cp = 134.08 (J/K)

Oxygen  delta moles = -0.00018775  delta grams = -0.00600777
G = 59.42 (J)  H = -6.82 (J)  S = -0.05 (J/K)  V = -21.59 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1100.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.07  COH = 1.81  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.97 (gm)  density = 2.50 (gm/cc)  viscosity = 5.62 (log 10 poise)  (analysis in wt %)
G = -1578226.30 (J)  H = -1231747.87 (J)  S = 252.32 (J/K)  V = 38.34 (cc)  Cp = 129.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.99 | 0.52 | 14.96 | 0.62 | 0.00 | 3.11 | 0.01 | 0.87 | 0.00 | 0.00 | 2.48 | 4.08 | 2.20 | 0.10 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.03 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.68Mg1.20Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -58468.93 (J)  H = -45804.18 (J)  S = 9.22 (J/K)  V = 1.18 (cc)  Cp = 4.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.88 | 95.96 | 67.94 | 5.16 | -4.93 | 7.29 | 0.47 |

Total solids  mass = 4.03 (gm)  density = 3.41 (gm/cc)
G = -58468.93 (J)  H = -45804.18 (J)  S = 9.22 (J/K)  V = 1.18 (cc)  Cp = 4.83 (J/K)

Viscosity of the System: 5.68 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1636695.23 (J) H = -1277552.05 (J) S = 261.55 (J/K) V = 39.52 (cc) Cp = 133.92 (J/K)

Oxygen delta moles = -0.000225649 delta grams = -0.00722051
G = 70.84 (J) H = -8.12 (J) S = -0.06 (J/K) V = -25.76 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 95.55 (gm) density = 2.50 (gm/cc) viscosity = 5.73 (log 10 poise) (analysis in wt %)
G = -1569927.05 (J) H = -1228706.96 (J) S = 250.32 (J/K) V = 38.18 (cc) Cp = 128.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.09 | 0.52 | 15.01 | 0.61 | 0.00 | 3.01 | 0.01 | 0.80 | 0.00 | 0.00 | 2.48 | 4.10 | 2.21 | 0.11 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.44 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.18Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -64136.25 (J) H = -50326.65 (J) S = 10.13 (J/K) V = 1.30 (cc) Cp = 5.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.04 | 95.83 | 70.01 | 5.32 | -5.10 | 7.49 | 0.48 |

Total solids mass = 4.44 (gm) density = 3.42 (gm/cc)
G = -64136.25 (J) H = -50326.65 (J) S = 10.13 (J/K) V = 1.30 (cc) Cp = 5.31 (J/K)

Viscosity of the System: 5.79 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1634063.30 (J) H = -1279033.61 (J) S = 260.45 (J/K) V = 39.48 (cc) Cp = 133.76 (J/K)

Oxygen delta moles = -0.000265711 delta grams = -0.00850243
G = 82.74 (J) H = -9.46 (J) S = -0.07 (J/K) V = -30.11 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1080.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.06 COH = 1.76 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 95.13 (gm) density = 2.50 (gm/cc) viscosity = 5.83 (log 10 poise) (analysis in wt %)
G = -1561783.10 (J) H = -1225759.37 (J) S = 248.33 (J/K) V = 38.01 (cc) Cp = 127.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.18 | 0.53 | 15.06 | 0.59 | 0.00 | 2.91 | 0.01 | 0.74 | 0.00 | 0.00 | 2.49 | 4.12 | 2.22 | 0.11 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.86 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.72Mg1.15Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -69658.15 (J) H = -54750.63 (J) S = 11.02 (J/K) V = 1.42 (cc) Cp = 5.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.20 | 95.70 | 72.08 | 5.50 | -5.27 | 7.70 | 0.50 |

Total solids mass = 4.86 (gm) density = 3.43 (gm/cc)
G = -69658.15 (J) H = -54750.63 (J) S = 11.02 (J/K) V = 1.42 (cc) Cp = 5.78 (J/K)

Viscosity of the System: 5.90 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1631441.26 (J) H = -1280509.99 (J) S = 259.34 (J/K) V = 39.43 (cc) Cp = 133.60 (J/K)

Oxygen delta moles = -0.000307904 delta grams = -0.00985256
G = 95.10 (J) H = -10.85 (J) S = -0.08 (J/K) V = -34.64 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1070.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.05 COH = 1.74 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 91.79 (gm) density = 2.50 (gm/cc) viscosity = 5.94 (log 10 poise) (analysis in wt %)
G = -1505339.34 (J) H = -1184639.49 (J) S = 238.77 (J/K) V = 36.72 (cc) Cp = 123.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.58 | 0.55 | 14.86 | 0.58 | 0.00 | 2.84 | 0.01 | 0.67 | 0.00 | 0.00 | 2.41 | 4.02 | 2.28 | 0.11 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.45 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.75Mg1.12Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -77466.12 (J) H = -60959.86 (J) S = 12.29 (J/K) V = 1.58 (cc) Cp = 6.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.53 | 95.81 | 75.22 | 5.53 | -5.31 | 7.77 | 0.49 |

feldspar mass = 2.74 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.27Al1.27Si2.73O8
G = -46007.03 (J) H = -37137.02 (J) S = 6.60 (J/K) V = 1.05 (cc) Cp = 3.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.19 | 26.73 | 3.08 |

Total solids mass = 8.20 (gm) density = 3.11 (gm/cc)
G = -123473.15 (J) H = -98096.88 (J) S = 18.89 (J/K) V = 2.64 (cc) Cp = 9.82 (J/K)

Viscosity of the System: 6.07 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1628812.49 (J) H = -1282736.37 (J) S = 257.66 (J/K) V = 39.36 (cc) Cp = 132.91 (J/K)

Oxygen delta moles = -0.000387552 delta grams = -0.0124012

G = 118.71 (J)  H = -13.52 (J)  S = -0.10 (J/K)  V = -43.28 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: f8p2

T = 1060.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.04  COH = 1.72  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 85.04 (gm)  density = 2.50 (gm/cc)  viscosity = 5.97 (log 10 poise)  (analysis in wt %)
G = -1392501.06 (J)  H = -1098092.54 (J)  S = 220.84 (J/K)  V = 34.05 (cc)  Cp = 113.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.55 | 0.59 | 14.83 | 0.58 | 0.00 | 2.83 | 0.01 | 0.61 | 0.00 | 0.00 | 2.33 | 3.94 | 2.43 | 0.12 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.16 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.79Mg1.09Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -86705.69 (J)  H = -68301.21 (J)  S = 13.81 (J/K)  V = 1.78 (cc)  Cp = 7.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.34 | 95.95 | 78.67 | 5.66 | -5.42 | 8.00 | 0.49 |

feldspar  mass = 6.89 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.03Na0.70Ca0.26Al1.26Si2.74O8
G = -115442.06 (J)  H = -93394.81 (J)  S = 16.54 (J/K)  V = 2.64 (cc)  Cp = 8.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.44 | 26.24 | 3.32 |

quartz  mass = 1.88 (gm)  density = 2.56 (gm/cc)
SiO2
G = -31545.68 (J)  H = -25838.82 (J)  S = 4.28 (J/K)  V = 0.74 (cc)  Cp = 2.25 (J/K)

Total solids  mass = 14.94 (gm)  density = 2.89 (gm/cc)
G = -233693.43 (J)  H = -187534.84 (J)  S = 34.62 (J/K)  V = 5.16 (cc)  Cp = 17.94 (J/K)

Viscosity of the System: 6.23 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.55 (gm/cc)
G = -1626194.50 (J)  H = -1285627.38 (J)  S = 255.46 (J/K)  V = 39.21 (cc)  Cp = 131.90 (J/K)

Oxygen  delta moles = -0.000483516  delta grams = -0.0154719
G = 146.88 (J)  H = -16.69 (J)  S = -0.12 (J/K)  V = -53.59 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1050.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.04  COH = 1.70  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 78.66 (gm)  density = 2.50 (gm/cc)  viscosity = 5.99 (log 10 poise)  (analysis in wt %)
G = -1286109.69 (J)  H = -1016223.94 (J)  S = 203.97 (J/K)  V = 31.53 (cc)  Cp = 105.36 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.45 0.64 14.85 0.58 0.00 2.80 0.01 0.56 0.00 0.00 2.25 3.86 2.60 0.13 1.28 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.83 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.82Mg1.05Fe'"0.03Ti0.00Al0.15Si1.92O6
G = -95187.82 (J) H = -75068.46 (J) S = 15.21 (J/K) V = 1.97 (cc) Cp = 8.02 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-86.99 96.09 81.93 5.82 -5.56 8.24 0.48

feldspar mass = 10.71 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.26Al1.26Si2.74O8
G = -179063.97 (J) H = -145192.82 (J) S = 25.60 (J/K) V = 4.11 (cc) Cp = 13.08 (J/K)
albite anorthite sanidine
70.59 25.84 3.58

quartz mass = 3.78 (gm) density = 2.56 (gm/cc)
SiO2
G = -63237.72 (J) H = -51912.84 (J) S = 8.56 (J/K) V = 1.48 (cc) Cp = 4.51 (J/K)

Total solids mass = 21.32 (gm) density = 2.82 (gm/cc)
G = -337489.51 (J) H = -272174.12 (J) S = 49.36 (J/K) V = 7.55 (cc) Cp = 25.60 (J/K)

Viscosity of the System: 6.41 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1623599.20 (J) H = -1288398.06 (J) S = 253.34 (J/K) V = 39.08 (cc) Cp = 130.96 (J/K)

Oxygen delta moles = -0.000578236 delta grams = -0.0185029
G = 174.19 (J) H = -19.75 (J) S = -0.15 (J/K) V = -63.61 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1040.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.03 COH = 1.67 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 73.02 (gm) density = 2.49 (gm/cc) viscosity = 6.00 (log 10 poise) (analysis in wt %)
G = -1192405.33 (J) H = -944103.33 (J) S = 189.09 (J/K) V = 29.30 (cc) Cp = 97.77 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.36 0.68 14.86 0.57 0.00 2.75 0.01 0.51 0.00 0.00 2.19 3.78 2.76 0.14 1.38 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.44 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.02Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -102772.41 (J) H = -81153.68 (J) S = 16.46 (J/K) V = 2.13 (cc) Cp = 8.69 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-90.37 96.22 84.94 5.97 -5.69 8.47 0.47

feldspar mass = 14.08 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -234983.15 (J) H = -190965.60 (J) S = 33.52 (J/K) V = 5.40 (cc) Cp = 17.33 (J/K)
albite anorthite sanidine
70.70 25.47 3.83

quartz mass = 5.44 (gm) density = 2.56 (gm/cc)
SiO2
G = -90865.48 (J) H = -74758.61 (J) S = 12.27 (J/K) V = 2.13 (cc) Cp = 6.48 (J/K)

Total solids mass = 26.96 (gm) density = 2.79 (gm/cc)
G = -428621.05 (J) H = -346877.90 (J) S = 62.25 (J/K) V = 9.66 (cc) Cp = 32.50 (J/K)

Viscosity of the System: 6.60 (log 10 poise)

System mass = 99.98 (gm) density = 2.57 (gm/cc)
G = -1621026.37 (J) H = -1290981.23 (J) S = 251.34 (J/K) V = 38.95 (cc) Cp = 130.28 (J/K)

Oxygen delta moles = -0.000669616 delta grams = -0.0214269
G = 200.02 (J) H = -22.63 (J) S = -0.17 (J/K) V = -73.11 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: f8p2

T = 1030.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.02 COH = 1.65 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 68.01 (gm) density = 2.49 (gm/cc) viscosity = 6.02 (log 10 poise) (analysis in wt %)
G = -1109342.23 (J) H = -880153.98 (J) S = 175.87 (J/K) V = 27.32 (cc) Cp = 91.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.28 | 0.73 | 14.89 | 0.56 | 0.00 | 2.69 | 0.01 | 0.46 | 0.00 | 0.00 | 2.13 | 3.69 | 2.92 | 0.15 | 1.48 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.99 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.88Mg0.99Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -109564.96 (J) H = -86640.26 (J) S = 17.59 (J/K) V = 2.28 (cc) Cp = 9.31 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-93.47 96.35 87.69 6.12 -5.82 8.68 0.46

feldspar mass = 17.07 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -284430.55 (J) H = -231674.19 (J) S = 40.48 (J/K) V = 6.54 (cc) Cp = 20.99 (J/K)
albite anorthite sanidine
70.78 25.13 4.08

quartz mass = 6.90 (gm) density = 2.56 (gm/cc)
SiO2
G = -115137.31 (J) H = -94937.96 (J) S = 15.50 (J/K) V = 2.70 (cc) Cp = 8.21 (J/K)

Total solids mass = 31.96 (gm) density = 2.77 (gm/cc)
G = -509132.82 (J) H = -413252.40 (J) S = 73.58 (J/K) V = 11.52 (cc) Cp = 38.51 (J/K)

Viscosity of the System: 6.80 (log 10 poise)

System mass = 99.98 (gm) density = 2.57 (gm/cc)
G = -1618475.05 (J) H = -1293406.38 (J) S = 249.45 (J/K) V = 38.84 (cc) Cp = 129.55 (J/K)

Oxygen delta moles = -0.00075728 delta grams = -0.0242321
G = 224.29 (J) H = -25.33 (J) S = -0.19 (J/K) V = -82.05 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 1020.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.01 COH = 1.63 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 63.54 (gm) density = 2.49 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -1035315.30 (J) H = -823139.81 (J) S = 164.08 (J/K) V = 25.55 (cc) Cp = 85.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.20 | 0.78 | 14.91 | 0.55 | 0.00 | 2.60 | 0.02 | 0.43 | 0.00 | 0.00 | 2.08 | 3.61 | 3.08 | 0.16 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.50 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg0.97Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -115646.28 (J) H = -91591.60 (J) S = 18.60 (J/K) V = 2.42 (cc) Cp = 9.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.29 | 96.48 | 90.18 | 6.26 | -5.95 | 8.87 | 0.45 |

feldspar mass = 19.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -328374.37 (J) H = -268073.46 (J) S = 46.63 (J/K) V = 7.57 (cc) Cp = 24.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.84 | 24.83 | 4.34 |

quartz mass = 8.20 (gm) density = 2.56 (gm/cc)
SiO2
G = -136608.46 (J) H = -112891.36 (J) S = 18.34 (J/K) V = 3.20 (cc) Cp = 9.75 (J/K)

Total solids mass = 36.44 (gm) density = 2.76 (gm/cc)
G = -580629.11 (J) H = -472556.42 (J) S = 83.57 (J/K) V = 13.19 (cc) Cp = 43.86 (J/K)

Viscosity of the System: 7.03 (log 10 poise)

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1615944.41 (J) H = -1295696.23 (J) S = 247.65 (J/K) V = 38.74 (cc) Cp = 128.89 (J/K)

Oxygen delta moles = -0.000840909 delta grams = -0.0269081
G = 246.93 (J) H = -27.82 (J) S = -0.21 (J/K) V = -90.41 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 1010.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.00 COH = 1.60

IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 59.52 (gm) density = 2.48 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -969028.08 (J) H = -772063.08 (J) S = 153.50 (J/K) V = 23.97 (cc) Cp = 79.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.12 | 0.84 | 14.95 | 0.53 | 0.00 | 2.51 | 0.02 | 0.39 | 0.00 | 0.00 | 2.03 | 3.52 | 3.25 | 0.17 | 1.69 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.96 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.92Mg0.95Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -121082.94 (J) H = -96059.36 (J) S = 19.50 (J/K) V = 2.54 (cc) Cp = 10.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.84 | 96.60 | 92.42 | 6.40 | -6.07 | 9.04 | 0.45 |

feldspar mass = 22.13 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.25Al1.25Si2.75O8
G = -367599.50 (J) H = -300775.57 (J) S = 52.08 (J/K) V = 8.48 (cc) Cp = 27.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.87 | 24.55 | 4.58 |

quartz mass = 9.36 (gm) density = 2.56 (gm/cc)
SiO2
G = -155723.20 (J) H = -128971.44 (J) S = 20.85 (J/K) V = 3.66 (cc) Cp = 11.12 (J/K)

Total solids mass = 40.45 (gm) density = 2.75 (gm/cc)
G = -644405.63 (J) H = -525806.36 (J) S = 92.43 (J/K) V = 14.68 (cc) Cp = 48.65 (J/K)

Viscosity of the System: 7.30 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1613433.71 (J) H = -1297869.44 (J) S = 245.93 (J/K) V = 38.65 (cc) Cp = 128.29 (J/K)

Oxygen delta moles = -0.00092028 delta grams = -0.0294479
G = 267.91 (J) H = -30.11 (J) S = -0.23 (J/K) V = -98.18 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: f8p2

T = 1000.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = -0.00 COH = 1.58
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 55.90 (gm) density = 2.48 (gm/cc) viscosity = 6.08 (log 10 poise) (analysis in wt %)
G = -909415.05 (J) H = -726104.31 (J) S = 143.98 (J/K) V = 22.54 (cc) Cp = 74.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.04 | 0.89 | 14.98 | 0.51 | 0.00 | 2.40 | 0.02 | 0.36 | 0.00 | 0.00 | 1.98 | 3.43 | 3.41 | 0.18 | 1.80 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.38 (gm) density = 3.53 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.94Mg0.92Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -125933.12 (J) H = -100088.07 (J) S = 20.30 (J/K) V = 2.66 (cc) Cp = 10.81 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.13 96.71 94.43 6.54 -6.19 9.20 0.44

feldspar mass = 24.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -402752.71 (J) H = -330285.04 (J) S = 56.92 (J/K) V = 9.31 (cc) Cp = 29.78 (J/K)
albite anorthite sanidine
70.87 24.30 4.83

quartz mass = 10.41 (gm) density = 2.56 (gm/cc)
SiO2
G = -172841.41 (J) H = -143463.98 (J) S = 23.07 (J/K) V = 4.06 (cc) Cp = 12.35 (J/K)

Total solids mass = 44.07 (gm) density = 2.75 (gm/cc)
G = -701527.24 (J) H = -573837.10 (J) S = 100.29 (J/K) V = 16.03 (cc) Cp = 52.94 (J/K)

Viscosity of the System: 7.62 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1610942.29 (J) H = -1299941.40 (J) S = 244.28 (J/K) V = 38.57 (cc) Cp = 127.74 (J/K)

Oxygen delta moles = -0.000995277 delta grams = -0.0318477
G = 287.24 (J) H = -32.21 (J) S = -0.25 (J/K) V = -105.35 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 52.63 (gm) density = 2.48 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -855588.60 (J) H = -684581.30 (J) S = 135.38 (J/K) V = 21.25 (cc) Cp = 70.43 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.95 0.94 15.02 0.49 0.00 2.29 0.02 0.33 0.00 0.00 1.94 3.34 3.56 0.19 1.91 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.76 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.91Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -130249.88 (J) H = -103717.90 (J) S = 21.00 (J/K) V = 2.76 (cc) Cp = 11.21 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.17 96.81 96.22 6.67 -6.30 9.33 0.43

feldspar mass = 26.23 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -434373.53 (J) H = -357022.89 (J) S = 61.24 (J/K) V = 10.05 (cc) Cp = 32.13 (J/K)
albite anorthite sanidine
70.86 24.07 5.07

quartz mass = 11.35 (gm) density = 2.56 (gm/cc)

SiO2
G = -188257.51 (J)  H = -156602.96 (J)  S = 25.06 (J/K)  V = 4.43 (cc)  Cp = 13.46 (J/K)

Total solids  mass = 47.33 (gm)  density = 2.75 (gm/cc)
G = -752880.92 (J)  H = -617343.74 (J)  S = 107.30 (J/K)  V = 17.24 (cc)  Cp = 56.81 (J/K)

Viscosity of the System: 8.06 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.60 (gm/cc)
G = -1608469.51 (J)  H = -1301925.04 (J)  S = 242.68 (J/K)  V = 38.49 (cc)  Cp = 127.24 (J/K)

Oxygen  delta moles = -0.00106588  delta grams = -0.0341069
G = 304.93 (J)  H = -34.11 (J)  S = -0.27 (J/K)  V = -111.94 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 980.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = -0.02  COH = 1.53
IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 49.66 (gm)  density = 2.47 (gm/cc)  viscosity = 6.11 (log 10 poise)  (analysis in wt %)
G = -806801.44 (J)  H = -646920.06 (J)  S = 127.58 (J/K)  V = 20.08 (cc)  Cp = 66.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.86 | 1.00 | 15.07 | 0.47 | 0.00 | 2.18 | 0.02 | 0.31 | 0.00 | 0.00 | 1.90 | 3.25 | 3.72 | 0.20 | 2.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.10 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.89Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -134082.75 (J)  H = -106985.96 (J)  S = 21.62 (J/K)  V = 2.85 (cc)  Cp = 11.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.99 | 96.91 | 97.81 | 6.80 | -6.40 | 9.45 | 0.42 |

feldspar  mass = 27.99 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -462916.33 (J)  H = -381343.86 (J)  S = 65.09 (J/K)  V = 10.73 (cc)  Cp = 34.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.83 | 23.85 | 5.31 |

quartz  mass = 12.21 (gm)  density = 2.56 (gm/cc)
SiO2
G = -202214.28 (J)  H = -168581.44 (J)  S = 26.84 (J/K)  V = 4.77 (cc)  Cp = 14.47 (J/K)

Total solids  mass = 50.30 (gm)  density = 2.74 (gm/cc)
G = -799213.36 (J)  H = -656911.26 (J)  S = 113.56 (J/K)  V = 18.34 (cc)  Cp = 60.30 (J/K)

Viscosity of the System: 8.80 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.60 (gm/cc)
G = -1606014.80 (J)  H = -1303831.33 (J)  S = 241.14 (J/K)  V = 38.42 (cc)  Cp = 126.77 (J/K)

Oxygen  delta moles = -0.00113216  delta grams = -0.0362276

G = 321.04 (J)  H = -35.83 (J)  S = -0.28 (J/K)  V = -117.96 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 970.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = -0.03  COH = 1.50 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 46.96 (gm)  density = 2.47 (gm/cc)  viscosity = 6.12 (log 10 poise)  (analysis in wt %)
G = -762419.41 (J)  H = -612633.74 (J)  S = 120.49 (J/K)  V = 19.01 (cc)  Cp = 62.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.76 | 1.05 | 15.11 | 0.45 | 0.00 | 2.06 | 0.02 | 0.29 | 0.00 | 0.00 | 1.87 | 3.15 | 3.88 | 0.21 | 2.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.41 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.88Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -137478.26 (J)  H = -109926.91 (J)  S = 22.16 (J/K)  V = 2.93 (cc)  Cp = 11.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.61 | 97.00 | 99.22 | 6.93 | -6.51 | 9.55 | 0.42 |

feldspar  mass = 29.60 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -488766.54 (J)  H = -403549.09 (J)  S = 68.55 (J/K)  V = 11.35 (cc)  Cp = 36.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.79 | 23.66 | 5.55 |

quartz  mass = 12.99 (gm)  density = 2.56 (gm/cc)
SiO2
G = -214913.39 (J)  H = -179559.90 (J)  S = 28.44 (J/K)  V = 5.07 (cc)  Cp = 15.38 (J/K)

Total solids  mass = 53.00 (gm)  density = 2.74 (gm/cc)
G = -841158.18 (J)  H = -693035.90 (J)  S = 119.15 (J/K)  V = 19.34 (cc)  Cp = 63.48 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.61 (gm/cc)
G = -1603577.60 (J)  H = -1305669.65 (J)  S = 239.64 (J/K)  V = 38.35 (cc)  Cp = 126.33 (J/K)

Oxygen  delta moles = -0.00119423  delta grams = -0.0382141
G = 335.64 (J)  H = -37.37 (J)  S = -0.30 (J/K)  V = -123.44 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 960.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = -0.04  COH = 1.47 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 44.50 (gm)  density = 2.47 (gm/cc)  viscosity = 6.14 (log 10 poise)  (analysis in wt %)
G = -721901.09 (J)  H = -581306.82 (J)  S = 114.01 (J/K)  V = 18.03 (cc)  Cp = 59.56 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.65 1.11 15.16 0.43 0.00 1.94 0.02 0.27 0.00 0.00 1.83 3.06 4.03 0.23 2.26 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.68 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.86Fe"'0.03Ti0.00Al0.17Si1.90O6
G = -140480.08 (J) H = -112573.15 (J) S = 22.63 (J/K) V = 3.00 (cc) Cp = 12.18 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.06 97.09 100.47 7.06 -6.61 9.63 0.41

feldspar mass = 31.07 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -512252.94 (J) H = -423895.64 (J) S = 71.65 (J/K) V = 11.91 (cc) Cp = 37.96 (J/K)
albite anorthite sanidine
70.73 23.48 5.78

quartz mass = 13.71 (gm) density = 2.56 (gm/cc)
SiO2
G = -226523.29 (J) H = -189672.48 (J) S = 29.88 (J/K) V = 5.35 (cc) Cp = 16.22 (J/K)

Total solids mass = 55.46 (gm) density = 2.74 (gm/cc)
G = -879256.30 (J) H = -726141.27 (J) S = 124.17 (J/K) V = 20.26 (cc) Cp = 66.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1601157.40 (J) H = -1307448.09 (J) S = 238.18 (J/K) V = 38.29 (cc) Cp = 125.92 (J/K)

Oxygen delta moles = -0.00125229 delta grams = -0.0400718
G = 348.81 (J) H = -38.74 (J) S = -0.31 (J/K) V = -128.39 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: f8p2

T = 950.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = -0.05 COH = 1.45 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 41.91 (gm) density = 2.46 (gm/cc) viscosity = 6.15 (log 10 poise) (analysis in wt %)
G = -679894.68 (J) H = -548652.92 (J) S = 107.30 (J/K) V = 17.02 (cc) Cp = 56.12 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.64 1.02 15.25 0.40 0.00 1.80 0.02 0.25 0.00 0.00 1.79 2.98 4.20 0.24 2.40 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.84 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.01Mg0.86Fe"'0.03Ti0.00Al0.17Si1.90O6
G = -142061.94 (J) H = -114121.73 (J) S = 22.84 (J/K) V = 3.04 (cc) Cp = 12.34 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.80 97.16 101.14 7.13 -6.71 9.67 0.40

feldspar mass = 32.56 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -535960.71 (J) H = -444513.49 (J) S = 74.76 (J/K) V = 12.48 (cc) Cp = 39.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.55 | 23.35 | 6.09 |

quartz mass = 14.51 (gm) density = 2.56 (gm/cc)
SiO2
G = -239414.16 (J) H = -200902.11 (J) S = 31.49 (J/K) V = 5.67 (cc) Cp = 17.15 (J/K)

rhm-oxide mass = 0.14 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe'"0.17Al0.16Ti0.83O3
G = -1435.61 (J) H = -1095.70 (J) S = 0.28 (J/K) V = 0.03 (cc) Cp = 0.14 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.95 | 8.68 | 73.14 | 0.33 | 7.90 |

Total solids mass = 58.05 (gm) density = 2.74 (gm/cc)
G = -918872.42 (J) H = -760633.02 (J) S = 129.37 (J/K) V = 21.21 (cc) Cp = 69.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1598767.10 (J) H = -1309285.95 (J) S = 236.67 (J/K) V = 38.23 (cc) Cp = 125.48 (J/K)

Oxygen delta moles = -0.00128253 delta grams = -0.0410393
G = 354.01 (J) H = -39.21 (J) S = -0.32 (J/K) V = -130.43 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 940.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = -0.06 COH = 1.42 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 39.56 (gm) density = 2.46 (gm/cc) viscosity = 6.15 (log 10 poise) (analysis in wt %)
G = -641614.53 (J) H = -518821.45 (J) S = 101.22 (J/K) V = 16.10 (cc) Cp = 52.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.66 | 0.97 | 15.22 | 0.37 | 0.00 | 1.65 | 0.02 | 0.24 | 0.00 | 0.00 | 1.76 | 2.93 | 4.37 | 0.25 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.66 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.60Mg0.28)3Al2Si3O12
G = -9015.72 (J) H = -7378.19 (J) S = 1.35 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.46 | 11.60 | 27.93 |

orthopyroxene mass = 10.52 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.01Mg0.86Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -137770.10 (J) H = -110985.60 (J) S = 22.08 (J/K) V = 2.95 (cc) Cp = 11.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.48 | 97.18 | 101.01 | 7.06 | -6.65 | 9.49 | 0.40 |

feldspar mass = 33.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -553135.21 (J) H = -459775.28 (J) S = 76.96 (J/K) V = 12.90 (cc) Cp = 41.03 (J/K)
albite anorthite sanidine
70.55 23.00 6.45

quartz mass = 15.32 (gm) density = 2.56 (gm/cc)
SiO2
G = -252442.05 (J) H = -212293.71 (J) S = 33.09 (J/K) V = 5.98 (cc) Cp = 18.10 (J/K)

rhm-oxide mass = 0.24 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.73Mg0.10Fe'"0.17Al0.15Ti0.84O3
G = -2397.24 (J) H = -1835.65 (J) S = 0.46 (J/K) V = 0.05 (cc) Cp = 0.23 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.96 8.48 73.49 0.35 7.72

Total solids mass = 60.39 (gm) density = 2.74 (gm/cc)
G = -954760.32 (J) H = -792268.42 (J) S = 133.94 (J/K) V = 22.05 (cc) Cp = 72.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1596374.86 (J) H = -1311089.87 (J) S = 235.16 (J/K) V = 38.15 (cc) Cp = 125.03 (J/K)

Oxygen delta moles = -0.00134418 delta grams = -0.0430123
G = 367.67 (J) H = -40.62 (J) S = -0.34 (J/K) V = -135.58 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 930.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = -0.07 COH = 1.39 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 37.34 (gm) density = 2.45 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -605364.85 (J) H = -490455.27 (J) S = 95.51 (J/K) V = 15.24 (cc) Cp = 50.00 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.75 0.93 15.07 0.35 0.00 1.49 0.03 0.23 0.00 0.00 1.74 2.92 4.53 0.27 2.69 0.00 0.00 0.00 0.00

garnet mass = 2.06 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.60Mg0.28)3Al2Si3O12
G = -28101.09 (J) H = -23058.15 (J) S = 4.19 (J/K) V = 0.52 (cc) Cp = 2.26 (J/K)
almandine grossular pyrope
60.13 11.85 28.01

orthopyroxene mass = 9.66 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.88Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -126747.97 (J) H = -102442.11 (J) S = 20.20 (J/K) V = 2.71 (cc) Cp = 11.01 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-106.70 97.13 99.76 6.79 -6.40 9.02 0.40

feldspar mass = 34.38 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -564106.43 (J) H = -469915.23 (J) S = 78.29 (J/K) V = 13.18 (cc) Cp = 41.88 (J/K)
albite anorthite sanidine
70.71 22.38 6.90

quartz mass = 16.19 (gm) density = 2.56 (gm/cc)
SiO2
G = -266439.45 (J) H = -224549.58 (J) S = 34.82 (J/K) V = 6.32 (cc) Cp = 19.11 (J/K)

rhm-oxide mass = 0.32 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.74Mg0.10Fe'"0.16Al0.15Ti0.84O3
G = -3224.18 (J) H = -2477.44 (J) S = 0.62 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.17 8.18 73.82 0.38 7.45

Total solids mass = 62.61 (gm) density = 2.75 (gm/cc)
G = -988619.12 (J) H = -822442.52 (J) S = 138.12 (J/K) V = 22.81 (cc) Cp = 74.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1593983.97 (J) H = -1312897.78 (J) S = 233.63 (J/K) V = 38.04 (cc) Cp = 124.56 (J/K)

Oxygen delta moles = -0.00143224 delta grams = -0.0458299
G = 388.17 (J) H = -42.77 (J) S = -0.36 (J/K) V = -143.27 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 920.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = -0.08 COH = 1.36 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 35.30 (gm) density = 2.44 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -572060.58 (J) H = -464354.63 (J) S = 90.27 (J/K) V = 14.44 (cc) Cp = 47.28 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.81 0.89 14.93 0.32 0.00 1.34 0.03 0.23 0.00 0.00 1.72 2.92 4.69 0.28 2.85 0.00 0.00 0.00 0.00

garnet mass = 3.33 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.60Mg0.28)3Al2Si3O12
G = -45298.95 (J) H = -37268.58 (J) S = 6.73 (J/K) V = 0.84 (cc) Cp = 3.63 (J/K)
almandine grossular pyrope
59.78 12.12 28.10

orthopyroxene mass = 8.88 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.89Fe'"0.02Ti0.00Al0.15Si1.91O6
G = -116788.08 (J) H = -94703.53 (J) S = 18.51 (J/K) V = 2.50 (cc) Cp = 10.13 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-104.84 97.07 98.43 6.53 -6.15 8.56 0.41

feldspar mass = 35.06 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -574269.09 (J) H = -479421.49 (J) S = 79.49 (J/K) V = 13.44 (cc) Cp = 42.67 (J/K)
albite anorthite sanidine
70.84 21.79 7.38

quartz mass = 16.99 (gm) density = 2.56 (gm/cc)
SiO2
G = -279250.02 (J) H = -235853.73 (J) S = 36.37 (J/K) V = 6.64 (cc) Cp = 20.03 (J/K)

rhm-oxide mass = 0.39 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.74Mg0.10Fe'"0.16Al0.14Ti0.85O3
G = -3947.16 (J) H = -3043.52 (J) S = 0.76 (J/K) V = 0.09 (cc) Cp = 0.38 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.38 7.89 74.12 0.42 7.19

Total solids mass = 64.65 (gm) density = 2.75 (gm/cc)
G = -1019553.30 (J) H = -850290.85 (J) S = 141.86 (J/K) V = 23.50 (cc) Cp = 76.84 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1591613.88 (J) H = -1314645.48 (J) S = 232.13 (J/K) V = 37.95 (cc) Cp = 124.12 (J/K)

Oxygen delta moles = -0.00150979 delta grams = -0.0483116
G = 405.41 (J) H = -44.55 (J) S = -0.38 (J/K) V = -149.77 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: f8p2

T = 910.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = -0.09 COH = 1.34
IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 33.41 (gm) density = 2.44 (gm/cc) viscosity = 6.10 (log 10 poise) (analysis in wt %)
G = -541255.64 (J) H = -440171.60 (J) S = 85.44 (J/K) V = 13.70 (cc) Cp = 44.76 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O
CO2 SO3 Cl2O-1 F2O-1
69.85 0.85 14.79 0.29 0.00 1.21 0.03 0.22 0.00 0.00 1.71 2.92 4.83 0.30 3.01 0.00 0.00 0.00
0.00

garnet mass = 4.47 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.12Fe"0.59Mg0.28)3Al2Si3O12
G = -60895.11 (J) H = -50233.27 (J) S = 9.01 (J/K) V = 1.14 (cc) Cp = 4.89 (J/K)
almandine grossular pyrope
59.40 12.40 28.20

orthopyroxene mass = 8.18 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.97Mg0.91Fe'"0.02Ti0.00Al0.15Si1.92O6
G = -107739.01 (J) H = -87654.41 (J) S = 16.98 (J/K) V = 2.30 (cc) Cp = 9.34 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.90 97.01 97.01 6.27 -5.91 8.11 0.41

feldspar mass = 35.70 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -583739.06 (J) H = -488386.29 (J) S = 80.59 (J/K) V = 13.69 (cc) Cp = 43.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.93 | 21.21 | 7.87 |

quartz mass = 17.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -291051.68 (J) H = -246350.22 (J) S = 37.78 (J/K) V = 6.93 (cc) Cp = 20.89 (J/K)

rhm-oxide mass = 0.46 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.74Mg0.11Fe'"0.15Al0.14Ti0.85O3
G = -4582.97 (J) H = -3546.06 (J) S = 0.88 (J/K) V = 0.10 (cc) Cp = 0.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.61 | 7.60 | 74.40 | 0.45 | 6.95 |

Total solids mass = 66.54 (gm) density = 2.75 (gm/cc)
G = -1048007.82 (J) H = -876170.24 (J) S = 145.24 (J/K) V = 24.15 (cc) Cp = 78.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1589263.46 (J) H = -1316341.85 (J) S = 230.67 (J/K) V = 37.86 (cc) Cp = 123.71 (J/K)

Oxygen delta moles = -0.00157821 delta grams = -0.0505009
G = 419.85 (J) H = -46.00 (J) S = -0.39 (J/K) V = -155.25 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 900.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.10 COH = 1.31 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 31.66 (gm) density = 2.43 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -512575.65 (J) H = -417613.54 (J) S = 80.95 (J/K) V = 13.01 (cc) Cp = 42.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.86 | 0.81 | 14.66 | 0.27 | 0.00 | 1.09 | 0.03 | 0.21 | 0.00 | 0.00 | 1.69 | 2.92 | 4.97 | 0.32 | 3.17 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.52 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.13Fe"0.59Mg0.28)3Al2Si3O12
G = -75129.98 (J) H = -62140.84 (J) S = 11.07 (J/K) V = 1.40 (cc) Cp = 6.03 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.99 | 12.69 | 28.32 |

orthopyroxene mass = 7.53 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.93Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -99472.51 (J) H = -81196.75 (J) S = 15.58 (J/K) V = 2.12 (cc) Cp = 8.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.90 | 96.94 | 95.52 | 6.01 | -5.66 | 7.68 | 0.41 |

feldspar mass = 36.30 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -592615.51 (J) H = -496888.74 (J) S = 81.60 (J/K) V = 13.92 (cc) Cp = 44.10 (J/K)
albite anorthite sanidine
70.98 20.64 8.38

quartz mass = 18.42 (gm) density = 2.56 (gm/cc)
SiO2
G = -301992.91 (J) H = -256159.42 (J) S = 39.07 (J/K) V = 7.19 (cc) Cp = 21.68 (J/K)

rhm-oxide mass = 0.51 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.00Fe"0.75Mg0.11Fe'"0.15Al0.13Ti0.86O3
G = -5145.20 (J) H = -3994.95 (J) S = 0.98 (J/K) V = 0.11 (cc) Cp = 0.49 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.84 7.31 74.65 0.49 6.71

Total solids mass = 68.29 (gm) density = 2.76 (gm/cc)
G = -1074356.10 (J) H = -900380.70 (J) S = 148.30 (J/K) V = 24.76 (cc) Cp = 80.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1586931.75 (J) H = -1317994.24 (J) S = 229.24 (J/K) V = 37.77 (cc) Cp = 123.32 (J/K)

Oxygen delta moles = -0.00163867 delta grams = -0.0524354
G = 431.84 (J) H = -47.18 (J) S = -0.41 (J/K) V = -159.83 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 30.01 (gm) density = 2.43 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -485702.81 (J) H = -396431.33 (J) S = 76.75 (J/K) V = 12.37 (cc) Cp = 40.23 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.86 0.77 14.53 0.24 0.00 0.98 0.03 0.21 0.00 0.00 1.68 2.92 5.10 0.33 3.35 0.00 0.00 0.00 0.00

garnet mass = 6.48 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.13Fe"0.59Mg0.28)3Al2Si3O12
G = -88207.65 (J) H = -73151.77 (J) S = 12.94 (J/K) V = 1.65 (cc) Cp = 7.07 (J/K)
almandine grossular pyrope
58.57 12.99 28.44

orthopyroxene mass = 6.94 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.95Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -91878.92 (J) H = -75246.63 (J) S = 14.30 (J/K) V = 1.96 (cc) Cp = 7.94 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-98.84 96.88 93.95 5.76 -5.43 7.27 0.42

feldspar mass = 36.87 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.09Na0.71Ca0.20Al1.20Si2.80O8
G = -600984.38 (J) H = -504997.58 (J) S = 82.52 (J/K) V = 14.15 (cc) Cp = 44.76 (J/K)
albite anorthite sanidine
70.99 20.09 8.91

quartz mass = 19.07 (gm) density = 2.56 (gm/cc)
SiO2
G = -312199.21 (J) H = -265383.28 (J) S = 40.25 (J/K) V = 7.45 (cc) Cp = 22.42 (J/K)

rhm-oxide mass = 0.57 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.75Mg0.11Fe"'0.14Al0.13Ti0.86O3
G = -5644.98 (J) H = -4398.26 (J) S = 1.07 (J/K) V = 0.12 (cc) Cp = 0.54 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.08 7.02 74.88 0.52 6.49

Total solids mass = 69.93 (gm) density = 2.76 (gm/cc)
G = -1098915.14 (J) H = -923177.52 (J) S = 151.09 (J/K) V = 25.33 (cc) Cp = 82.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1584617.95 (J) H = -1319608.85 (J) S = 227.84 (J/K) V = 37.69 (cc) Cp = 122.96 (J/K)

Oxygen delta moles = -0.00169218 delta grams = -0.0541478
G = 441.73 (J) H = -48.12 (J) S = -0.42 (J/K) V = -163.65 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 28.46 (gm) density = 2.42 (gm/cc) viscosity = 6.00 (log 10 poise) (analysis in wt %)
G = -460364.23 (J) H = -376410.37 (J) S = 72.80 (J/K) V = 11.75 (cc) Cp = 38.16 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.83 0.73 14.41 0.22 0.00 0.88 0.03 0.20 0.00 0.00 1.68 2.92 5.22 0.35 3.53 0.00 0.00 0.00 0.00

garnet mass = 7.37 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.13Fe"0.58Mg0.29)3Al2Si3O12
G = -100302.87 (J) H = -83403.89 (J) S = 14.65 (J/K) V = 1.87 (cc) Cp = 8.04 (J/K)
almandine grossular pyrope
58.12 13.31 28.57

orthopyroxene mass = 6.39 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.92Mg0.97Fe"'0.02Ti0.00Al0.13Si1.93O6
G = -84863.68 (J) H = -69731.42 (J) S = 13.12 (J/K) V = 1.81 (cc) Cp = 7.32 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-96.71 96.80 92.30 5.51 -5.19 6.86 0.42

feldspar mass = 37.42 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.09Na0.71Ca0.20Al1.20Si2.80O8
G = -608921.07 (J) H = -512773.31 (J) S = 83.38 (J/K) V = 14.36 (cc) Cp = 45.39 (J/K)
albite anorthite sanidine
70.98 19.54 9.48

quartz mass = 19.68 (gm) density = 2.56 (gm/cc)
SiO2
G = -321778.07 (J) H = -274109.27 (J) S = 41.34 (J/K) V = 7.69 (cc) Cp = 23.12 (J/K)

rhm-oxide mass = 0.61 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.75Mg0.11Fe'"0.13Al0.13Ti0.87O3
G = -6091.45 (J) H = -4762.64 (J) S = 1.15 (J/K) V = 0.13 (cc) Cp = 0.58 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.33 6.74 75.08 0.56 6.28

Total solids mass = 71.48 (gm) density = 2.76 (gm/cc)
G = -1121957.14 (J) H = -944780.55 (J) S = 153.65 (J/K) V = 25.86 (cc) Cp = 84.45 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1582321.37 (J) H = -1321190.92 (J) S = 226.45 (J/K) V = 37.62 (cc) Cp = 122.61 (J/K)

Oxygen delta moles = -0.00173963 delta grams = -0.0556661
G = 449.79 (J) H = -48.86 (J) S = -0.43 (J/K) V = -166.79 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 870.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.13 COH = 1.22 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 26.99 (gm) density = 2.42 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -436322.95 (J) H = -357363.57 (J) S = 69.07 (J/K) V = 11.17 (cc) Cp = 36.21 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.77 0.69 14.30 0.21 0.00 0.79 0.03 0.20 0.00 0.00 1.67 2.93 5.32 0.37 3.72 0.00 0.00 0.00 0.00

garnet mass = 8.20 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.58Mg0.29)3Al2Si3O12
G = -111566.49 (J) H = -93016.59 (J) S = 16.23 (J/K) V = 2.09 (cc) Cp = 8.93 (J/K)
almandine grossular pyrope
57.65 13.64 28.72

orthopyroxene mass = 5.89 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.99Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -78344.56 (J) H = -64587.77 (J) S = 12.03 (J/K) V = 1.67 (cc) Cp = 6.75 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-94.52 96.73 90.59 5.27 -4.96 6.48 0.43

feldspar mass = 37.95 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -616492.42 (J) H = -520269.79 (J) S = 84.17 (J/K) V = 14.57 (cc) Cp = 46.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.93 | 19.00 | 10.07 |

quartz mass = 20.26 (gm) density = 2.56 (gm/cc)
SiO2
G = -330822.83 (J) H = -282413.63 (J) S = 42.35 (J/K) V = 7.91 (cc) Cp = 23.78 (J/K)

rhm-oxide mass = 0.65 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.75Mg0.12Fe'"0.13Al0.12Ti0.87O3
G = -6492.18 (J) H = -5093.62 (J) S = 1.22 (J/K) V = 0.14 (cc) Cp = 0.62 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.60 | 6.46 | 75.26 | 0.59 | 6.09 |

Total solids mass = 72.95 (gm) density = 2.77 (gm/cc)
G = -1143718.48 (J) H = -965381.39 (J) S = 156.00 (J/K) V = 26.38 (cc) Cp = 86.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1580041.43 (J) H = -1322744.96 (J) S = 225.08 (J/K) V = 37.55 (cc) Cp = 122.29 (J/K)

Oxygen delta moles = -0.00178178 delta grams = -0.0570149
G = 456.26 (J) H = -49.41 (J) S = -0.44 (J/K) V = -169.35 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 25.59 (gm) density = 2.41 (gm/cc) viscosity = 5.90 (log 10 poise) (analysis in wt %)
G = -413370.86 (J) H = -339125.85 (J) S = 65.52 (J/K) V = 10.61 (cc) Cp = 34.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.70 | 0.65 | 14.19 | 0.19 | 0.00 | 0.71 | 0.03 | 0.20 | 0.00 | 0.00 | 1.67 | 2.94 | 5.41 | 0.39 | 3.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.97 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.57Mg0.29)3Al2Si3O12
G = -122129.71 (J) H = -102094.11 (J) S = 17.68 (J/K) V = 2.28 (cc) Cp = 9.77 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.16 | 13.97 | 28.87 |

orthopyroxene mass = 5.41 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.89Mg1.01Fe'"0.01Ti0.00Al0.12Si1.94O6
G = -72249.45 (J) H = -59759.84 (J) S = 11.02 (J/K) V = 1.54 (cc) Cp = 6.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.28 | 96.65 | 88.80 | 5.03 | -4.73 | 6.10 | 0.43 |

feldspar mass = 38.47 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.11Na0.71Ca0.18Al1.18Si2.82O8
G = -623758.27 (J) H = -527535.45 (J) S = 84.92 (J/K) V = 14.77 (cc) Cp = 46.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.85 | 18.46 | 10.69 |

quartz mass = 20.81 (gm) density = 2.56 (gm/cc)
SiO2
G = -339415.84 (J) H = -290363.81 (J) S = 43.29 (J/K) V = 8.13 (cc) Cp = 24.40 (J/K)

rhm-oxide mass = 0.69 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.75Mg0.12Fe'"0.12Al0.12Ti0.88O3
G = -6853.50 (J) H = -5395.81 (J) S = 1.29 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.88 | 6.19 | 75.40 | 0.63 | 5.90 |

Total solids mass = 74.35 (gm) density = 2.77 (gm/cc)
G = -1164406.78 (J) H = -985149.03 (J) S = 158.19 (J/K) V = 26.87 (cc) Cp = 87.63 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1577777.64 (J) H = -1324274.88 (J) S = 223.72 (J/K) V = 37.48 (cc) Cp = 121.98 (J/K)

Oxygen delta moles = -0.0018193 delta grams = -0.0582154
G = 461.36 (J) H = -49.80 (J) S = -0.45 (J/K) V = -171.40 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: f8p2

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 24.24 (gm) density = 2.41 (gm/cc) viscosity = 5.84 (log 10 poise) (analysis in wt %)
G = -391323.27 (J) H = -321549.89 (J) S = 62.12 (J/K) V = 10.07 (cc) Cp = 32.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.59 | 0.62 | 14.08 | 0.17 | 0.00 | 0.63 | 0.03 | 0.19 | 0.00 | 0.00 | 1.67 | 2.96 | 5.49 | 0.41 | 4.15 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.70 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.57Mg0.29)3Al2Si3O12
G = -132107.41 (J) H = -110728.16 (J) S = 19.04 (J/K) V = 2.47 (cc) Cp = 10.57 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.64 | 14.32 | 29.04 |

orthopyroxene mass = 4.97 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.03Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -66514.66 (J) H = -55198.09 (J) S = 10.08 (J/K) V = 1.41 (cc) Cp = 5.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.98 | 96.57 | 86.94 | 4.80 | -4.51 | 5.75 | 0.43 |

feldspar mass = 38.97 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.11Na0.71Ca0.18Al1.18Si2.82O8
G = -630772.59 (J) H = -534614.27 (J) S = 85.61 (J/K) V = 14.97 (cc) Cp = 47.17 (J/K)
albite anorthite sanidine
70.74 17.92 11.34

quartz mass = 21.34 (gm) density = 2.56 (gm/cc)
SiO2
G = -347630.97 (J) H = -298020.62 (J) S = 44.17 (J/K) V = 8.34 (cc) Cp = 25.00 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.12Fe'"0.12Al0.11Ti0.88O3
G = -7180.69 (J) H = -5673.07 (J) S = 1.34 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.17 5.92 75.52 0.67 5.72

Total solids mass = 75.70 (gm) density = 2.77 (gm/cc)
G = -1184206.32 (J) H = -1004234.21 (J) S = 160.24 (J/K) V = 27.34 (cc) Cp = 89.13 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1575529.58 (J) H = -1325784.11 (J) S = 222.36 (J/K) V = 37.42 (cc) Cp = 121.68 (J/K)

Oxygen delta moles = -0.00185276 delta grams = -0.0592861
G = 465.25 (J) H = -50.07 (J) S = -0.46 (J/K) V = -173.01 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 22.93 (gm) density = 2.40 (gm/cc) viscosity = 5.77 (log 10 poise) (analysis in wt %)
G = -370014.53 (J) H = -304502.79 (J) S = 58.85 (J/K) V = 9.55 (cc) Cp = 30.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.47 | 0.58 | 13.98 | 0.16 | 0.00 | 0.57 | 0.03 | 0.19 | 0.00 | 0.00 | 1.67 | 2.98 | 5.55 | 0.44 | 4.38 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.40 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.56Mg0.29)3Al2Si3O12
G = -141600.66 (J) H = -118999.83 (J) S = 20.30 (J/K) V = 2.65 (cc) Cp = 11.32 (J/K)
almandine grossular pyrope
56.11 14.67 29.22

orthopyroxene mass = 4.55 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.05Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -61083.59 (J) H = -50858.21 (J) S = 9.19 (J/K) V = 1.30 (cc) Cp = 5.23 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-87.62 96.49 85.01 4.57 -4.30 5.40 0.44

feldspar mass = 39.46 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.12Na0.71Ca0.17Al1.17Si2.83O8
G = -637584.29 (J) H = -541546.32 (J) S = 86.28 (J/K) V = 15.16 (cc) Cp = 47.75 (J/K)
albite anorthite sanidine
70.60 17.37 12.03

quartz mass = 21.85 (gm) density = 2.56 (gm/cc)
SiO2
G = -355535.69 (J) H = -305439.90 (J) S = 45.00 (J/K) V = 8.54 (cc) Cp = 25.57 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.12Fe'"0.11Al0.11Ti0.89O3
G = -7478.18 (J) H = -5928.65 (J) S = 1.39 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.47 5.66 75.61 0.70 5.55

Total solids mass = 77.01 (gm) density = 2.77 (gm/cc)
G = -1203282.40 (J) H = -1022772.91 (J) S = 162.16 (J/K) V = 27.81 (cc) Cp = 90.57 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1573296.93 (J) H = -1327275.70 (J) S = 221.01 (J/K) V = 37.36 (cc) Cp = 121.40 (J/K)

Oxygen delta moles = -0.00188268 delta grams = -0.0602433
G = 468.10 (J) H = -50.21 (J) S = -0.47 (J/K) V = -174.24 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 830.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.17 COH = 1.09 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 21.65 (gm) density = 2.40 (gm/cc) viscosity = 5.69 (log 10 poise) (analysis in wt %)
G = -349294.50 (J) H = -287863.23 (J) S = 55.69 (J/K) V = 9.04 (cc) Cp = 29.15 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.31 0.55 13.88 0.14 0.00 0.51 0.03 0.19 0.00 0.00 1.68 3.01 5.60 0.46 4.64 0.00 0.00 0.00 0.00

garnet mass = 11.06 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.56Mg0.29)3Al2Si3O12
G = -150698.65 (J) H = -126981.10 (J) S = 21.50 (J/K) V = 2.82 (cc) Cp = 12.03 (J/K)
almandine grossular pyrope
55.55 15.03 29.42

orthopyroxene mass = 4.15 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.83Mg1.08Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -55905.68 (J) H = -46700.35 (J) S = 8.34 (J/K) V = 1.19 (cc) Cp = 4.78 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-85.20 96.40 83.00 4.36 -4.09 5.08 0.45

feldspar mass = 39.94 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.13Na0.70Ca0.17Al1.17Si2.83O8
G = -644237.91 (J) H = -548368.38 (J) S = 86.91 (J/K) V = 15.35 (cc) Cp = 48.32 (J/K)
albite anorthite sanidine
70.42 16.83 12.76

quartz mass = 22.35 (gm) density = 2.56 (gm/cc)
SiO2
G = -363192.99 (J) H = -312674.12 (J) S = 45.80 (J/K) V = 8.73 (cc) Cp = 26.13 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.13Fe"'0.11Al0.11Ti0.89O3
G = -7749.68 (J) H = -6165.26 (J) S = 1.44 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.80 5.40 75.66 0.74 5.40

Total solids mass = 78.28 (gm) density = 2.77 (gm/cc)
G = -1221784.91 (J) H = -1040889.21 (J) S = 163.98 (J/K) V = 28.26 (cc) Cp = 91.99 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1571079.40 (J) H = -1328752.44 (J) S = 219.67 (J/K) V = 37.30 (cc) Cp = 121.13 (J/K)

Oxygen delta moles = -0.00190948 delta grams = -0.0611011
G = 470.05 (J) H = -50.25 (J) S = -0.47 (J/K) V = -175.14 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 20.15 (gm) density = 2.39 (gm/cc) viscosity = 5.55 (log 10 poise) (analysis in wt %)
G = -325012.97 (J) H = -268125.63 (J) S = 52.04 (J/K) V = 8.44 (cc) Cp = 27.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.10 | 0.50 | 13.75 | 0.13 | 0.00 | 0.46 | 0.03 | 0.19 | 0.00 | 0.00 | 1.70 | 3.13 | 5.51 | 0.50 | 4.99 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.73 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.55Mg0.30)3Al2Si3O12
G = -159904.42 (J) H = -135094.74 (J) S = 22.70 (J/K) V = 3.00 (cc) Cp = 12.76 (J/K)
almandine grossular pyrope
54.95 15.33 29.73

orthopyroxene mass = 3.73 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.81Mg1.10Fe"'0.01Ti0.00Al0.09Si1.95O6
G = -50531.66 (J) H = -42351.79 (J) S = 7.48 (J/K) V = 1.07 (cc) Cp = 4.31 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-82.62 96.33 80.80 4.16 -3.89 4.78 0.45

feldspar mass = 39.53 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.13Na0.71Ca0.17Al1.17Si2.83O8
G = -636728.09 (J) H = -543176.42 (J) S = 85.58 (J/K) V = 15.19 (cc) Cp = 47.83 (J/K)
albite anorthite sanidine
70.71 16.62 12.67

feldspar mass = 1.07 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -16790.60 (J) H = -14297.37 (J) S = 2.28 (J/K) V = 0.42 (cc) Cp = 1.27 (J/K)
albite anorthite sanidine
34.54 2.21 63.25

quartz mass = 22.92 (gm) density = 2.56 (gm/cc)
SiO2
G = -371854.23 (J) H = -320801.42 (J) S = 46.70 (J/K) V = 8.95 (cc) Cp = 26.75 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.13Fe'"0.10Al0.11Ti0.90O3
G = -8055.20 (J) H = -6430.90 (J) S = 1.49 (J/K) V = 0.18 (cc) Cp = 0.76 (J/K)
geikielite hematite ilmenite pyrophanite corundum
13.17 5.14 75.66 0.77 5.26

Total solids mass = 79.79 (gm) density = 2.77 (gm/cc)
G = -1243864.19 (J) H = -1062152.64 (J) S = 166.23 (J/K) V = 28.80 (cc) Cp = 93.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1568877.17 (J) H = -1330278.27 (J) S = 218.27 (J/K) V = 37.24 (cc) Cp = 120.85 (J/K)

Oxygen delta moles = -0.00193318 delta grams = -0.0618594
G = 471.11 (J) H = -50.19 (J) S = -0.48 (J/K) V = -175.70 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 18.59 (gm) density = 2.38 (gm/cc) viscosity = 5.37 (log 10 poise) (analysis in wt %)
G = -299947.01 (J) H = -247623.50 (J) S = 48.31 (J/K) V = 7.81 (cc) Cp = 25.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.84 | 0.46 | 13.60 | 0.12 | 0.00 | 0.43 | 0.04 | 0.19 | 0.00 | 0.00 | 1.74 | 3.30 | 5.35 | 0.54 | 5.41 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.37 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.54Mg0.30)3Al2Si3O12
G = -168710.61 (J) H = -142909.65 (J) S = 23.82 (J/K) V = 3.16 (cc) Cp = 13.45 (J/K)
almandine grossular pyrope
54.35 15.58 30.07

orthopyroxene mass = 3.34 (gm) density = 3.48 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.79Mg1.13Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -45337.46 (J) H = -38124.47 (J) S = 6.66 (J/K) V = 0.96 (cc) Cp = 3.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.02 | 96.26 | 78.54 | 3.97 | -3.71 | 4.49 | 0.46 |

feldspar mass = 38.74 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.71Ca0.17Al1.17Si2.83O8
G = -623417.70 (J) H = -533017.58 (J) S = 83.46 (J/K) V = 14.88 (cc) Cp = 46.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.27 | 16.58 | 12.15 |

feldspar mass = 2.57 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -40163.90 (J) H = -34277.25 (J) S = 5.43 (J/K) V = 1.01 (cc) Cp = 3.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.76 | 2.03 | 64.21 |

quartz mass = 23.49 (gm) density = 2.56 (gm/cc)
SiO2
G = -380764.59 (J) H = -329174.60 (J) S = 47.63 (J/K) V = 9.18 (cc) Cp = 27.40 (J/K)

rhm-oxide mass = 0.84 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.14Fe'"0.10Al0.10Ti0.90O3
G = -8349.33 (J) H = -6689.22 (J) S = 1.53 (J/K) V = 0.18 (cc) Cp = 0.79 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.57 | 4.88 | 75.61 | 0.80 | 5.14 |

Total solids mass = 81.35 (gm) density = 2.77 (gm/cc)
G = -1266743.59 (J) H = -1084192.77 (J) S = 168.54 (J/K) V = 29.37 (cc) Cp = 95.43 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1566690.60 (J) H = -1331816.27 (J) S = 216.84 (J/K) V = 37.18 (cc) Cp = 120.57 (J/K)

Oxygen delta moles = -0.00195415 delta grams = -0.0625304
G = 471.40 (J) H = -50.05 (J) S = -0.48 (J/K) V = -175.98 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 800.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.20 COH = 0.99 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 16.87 (gm) density = 2.37 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -272357.55 (J) H = -224937.01 (J) S = 44.19 (J/K) V = 7.12 (cc) Cp = 22.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.52 | 0.41 | 13.37 | 0.12 | 0.00 | 0.40 | 0.04 | 0.18 | 0.00 | 0.00 | 1.78 | 3.53 | 5.16 | 0.60 | 5.89 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.21 (gm) density = 3.91 (gm/cc) (analysis in mole %)

(Ca0.16Fe"0.54Mg0.30)3Al2Si3O12
G = -180130.88 (J) H = -152964.60 (J) S = 25.31 (J/K) V = 3.38 (cc) Cp = 14.35 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.04 | 15.88 | 30.08 |

orthopyroxene mass = 2.60 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.77Mg1.14Fe'"0.01Ti0.00Al0.09Si1.96O6
G = -35379.40 (J) H = -29839.14 (J) S = 5.16 (J/K) V = 0.75 (cc) Cp = 3.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -78.38 | 96.23 | 77.18 | 3.79 | -3.53 | 4.25 | 0.47 |

biotite mass = 0.26 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -4211.38 (J) H = -3587.18 (J) S = 0.58 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

| annite | phlogopite |
|---|---|
| 1.98 | 98.02 |

feldspar mass = 38.09 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.16Al1.16Si2.84O8
G = -612212.12 (J) H = -524600.73 (J) S = 81.64 (J/K) V = 14.62 (cc) Cp = 46.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.90 | 16.37 | 11.73 |

feldspar mass = 3.76 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -58762.28 (J) H = -50262.63 (J) S = 7.92 (J/K) V = 1.48 (cc) Cp = 4.45 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.11 | 1.87 | 65.02 |

quartz mass = 24.27 (gm) density = 2.56 (gm/cc)
SiO2
G = -392825.69 (J) H = -340308.61 (J) S = 48.94 (J/K) V = 9.48 (cc) Cp = 28.27 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.76Mg0.14Fe'"0.09Al0.10Ti0.90O3
G = -8640.40 (J) H = -6944.85 (J) S = 1.58 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.77 | 4.69 | 75.73 | 0.83 | 4.98 |

Total solids mass = 83.07 (gm) density = 2.77 (gm/cc)
G = -1292162.16 (J) H = -1108507.75 (J) S = 171.14 (J/K) V = 29.99 (cc) Cp = 97.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1564519.72 (J) H = -1333444.77 (J) S = 215.32 (J/K) V = 37.11 (cc) Cp = 120.28 (J/K)

Oxygen delta moles = -0.00197243 delta grams = -0.0631154
G = 470.96 (J) H = -49.82 (J) S = -0.49 (J/K) V = -175.99 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95

IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 14.10 (gm) density = 2.36 (gm/cc) viscosity = 4.84 (log 10 poise) (analysis in wt %)
G = -227627.25 (J) H = -187885.61 (J) S = 37.38 (J/K) V = 5.98 (cc) Cp = 19.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.24 | 0.33 | 12.76 | 0.13 | 0.00 | 0.43 | 0.04 | 0.16 | 0.00 | 0.00 | 1.85 | 4.04 | 4.82 | 0.66 | 6.53 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.18 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.56Mg0.28)3Al2Si3O12
G = -205237.77 (J) H = -174576.48 (J) S = 28.84 (J/K) V = 3.87 (cc) Cp = 16.40 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.79 | 16.47 | 27.75 |

biotite mass = 1.98 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -31507.29 (J) H = -26892.11 (J) S = 4.34 (J/K) V = 0.72 (cc) Cp = 2.50 (J/K)

| annite | phlogopite |
|---|---|
| 2.50 | 97.50 |

feldspar mass = 37.80 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -606690.85 (J) H = -520975.64 (J) S = 80.62 (J/K) V = 14.52 (cc) Cp = 45.90 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.98 | 15.38 | 11.64 |

feldspar mass = 3.83 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -59745.05 (J) H = -51216.92 (J) S = 8.02 (J/K) V = 1.50 (cc) Cp = 4.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.12 | 1.70 | 65.18 |

quartz mass = 26.12 (gm) density = 2.56 (gm/cc)
SiO2
G = -422294.99 (J) H = -366597.35 (J) S = 52.39 (J/K) V = 10.20 (cc) Cp = 30.39 (J/K)

rhm-oxide mass = 0.92 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.77Mg0.13Fe'"0.10Al0.09Ti0.91O3
G = -9030.29 (J) H = -7269.50 (J) S = 1.66 (J/K) V = 0.20 (cc) Cp = 0.85 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.53 | 4.85 | 77.13 | 0.86 | 4.64 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -237.70 (J) H = -202.34 (J) S = 0.03 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 85.84 (gm) density = 2.77 (gm/cc)
G = -1334743.95 (J) H = -1147730.34 (J) S = 175.91 (J/K) V = 31.01 (cc) Cp = 100.60 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1562371.19 (J) H = -1335615.95 (J) S = 213.29 (J/K) V = 37.00 (cc) Cp = 119.80 (J/K)

Oxygen delta moles = -0.0019846 delta grams = -0.0635049
G = 468.98 (J) H = -49.43 (J) S = -0.49 (J/K) V = -175.43 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 780.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.23 COH = 0.92 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 12.80 (gm) density = 2.35 (gm/cc) viscosity = 4.63 (log 10 poise) (analysis in wt %)
G = -206857.75 (J) H = -170793.18 (J) S = 34.24 (J/K) V = 5.45 (cc) Cp = 17.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.54 | 0.30 | 12.90 | 0.13 | 0.00 | 0.41 | 0.05 | 0.14 | 0.00 | 0.00 | 1.88 | 4.13 | 4.67 | 0.73 | 7.12 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.99 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.27)3Al2Si3O12
G = -201829.75 (J) H = -172028.19 (J) S = 28.30 (J/K) V = 3.81 (cc) Cp = 16.15 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.58 | 16.65 | 26.77 |

biotite mass = 2.19 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -34835.44 (J) H = -29799.29 (J) S = 4.78 (J/K) V = 0.79 (cc) Cp = 2.77 (J/K)

| annite | phlogopite |
|---|---|
| 2.64 | 97.36 |

feldspar mass = 37.79 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.73Ca0.16Al1.16Si2.84O8
G = -605992.71 (J) H = -521556.31 (J) S = 80.18 (J/K) V = 14.51 (cc) Cp = 45.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.34 | 15.63 | 11.03 |

feldspar mass = 4.63 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -72025.64 (J) H = -61883.84 (J) S = 9.63 (J/K) V = 1.82 (cc) Cp = 5.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.04 | 1.57 | 66.39 |

quartz mass = 26.59 (gm) density = 2.56 (gm/cc)
SiO2
G = -429280.17 (J) H = -373432.03 (J) S = 53.03 (J/K) V = 10.38 (cc) Cp = 30.90 (J/K)

rhm-oxide mass = 0.94 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.78Mg0.12Fe'"0.09Al0.09Ti0.91O3
G = -9165.64 (J) H = -7399.74 (J) S = 1.68 (J/K) V = 0.20 (cc) Cp = 0.87 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.01 | 4.63 | 77.81 | 0.87 | 4.67 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -251.83 (J) H = -214.86 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 87.14 (gm) density = 2.76 (gm/cc)
G = -1353381.18 (J) H = -1166314.28 (J) S = 177.63 (J/K) V = 31.52 (cc) Cp = 102.17 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1560238.93 (J) H = -1337107.46 (J) S = 211.87 (J/K) V = 36.98 (cc) Cp = 119.69 (J/K)

Oxygen delta moles = -0.00199698 delta grams = -0.0639011
G = 467.01 (J) H = -49.04 (J) S = -0.49 (J/K) V = -174.86 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 770.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.24 COH = 0.88 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 11.56 (gm) density = 2.34 (gm/cc) viscosity = 4.38 (log 10 poise) (analysis in wt %)
G = -187114.37 (J) H = -154485.12 (J) S = 31.28 (J/K) V = 4.95 (cc) Cp = 15.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.69 | 0.26 | 13.06 | 0.12 | 0.00 | 0.38 | 0.05 | 0.13 | 0.00 | 0.00 | 1.94 | 4.25 | 4.50 | 0.81 | 7.81 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.82 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -198741.78 (J) H = -169745.85 (J) S = 27.80 (J/K) V = 3.76 (cc) Cp = 15.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.30 | 16.81 | 25.89 |

biotite mass = 2.38 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -37758.74 (J) H = -32372.45 (J) S = 5.16 (J/K) V = 0.86 (cc) Cp = 3.00 (J/K)

| annite | phlogopite |
|---|---|
| 2.75 | 97.25 |

feldspar mass = 37.80 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -605595.65 (J) H = -522392.80 (J) S = 79.76 (J/K) V = 14.50 (cc) Cp = 46.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.68 | 15.87 | 10.45 |

feldspar mass = 5.37 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -83412.27 (J) H = -71828.49 (J) S = 11.10 (J/K) V = 2.11 (cc) Cp = 6.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.99 | 1.45 | 67.56 |

quartz mass = 27.04 (gm) density = 2.56 (gm/cc)
SiO2
G = -435992.13 (J) H = -380052.59 (J) S = 53.63 (J/K) V = 10.56 (cc) Cp = 31.38 (J/K)

rhm-oxide mass = 0.95 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.78Mg0.12Fe'"0.09Al0.09Ti0.91O3
G = -9278.65 (J) H = -7512.95 (J) S = 1.69 (J/K) V = 0.21 (cc) Cp = 0.88 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.55 | 4.41 | 78.45 | 0.87 | 4.72 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -227.38 (J) H = -194.44 (J) S = 0.03 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 88.38 (gm) density = 2.76 (gm/cc)
G = -1371006.59 (J) H = -1184099.57 (J) S = 179.18 (J/K) V = 32.00 (cc) Cp = 103.71 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1558120.96 (J) H = -1338584.69 (J) S = 210.46 (J/K) V = 36.96 (cc) Cp = 119.62 (J/K)

Oxygen delta moles = -0.00200911 delta grams = -0.064289
G = 464.92 (J) H = -48.64 (J) S = -0.49 (J/K) V = -174.25 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 760.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.25 COH = 0.84 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.38 (gm) density = 2.32 (gm/cc) viscosity = 4.09 (log 10 poise) (analysis in wt %)
G = -168359.67 (J) H = -138937.89 (J) S = 28.48 (J/K) V = 4.47 (cc) Cp = 14.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.64 | 0.23 | 13.21 | 0.12 | 0.00 | 0.36 | 0.06 | 0.11 | 0.00 | 0.00 | 2.04 | 4.40 | 4.29 | 0.92 | 8.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.67 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -195994.01 (J) H = -167748.37 (J) S = 27.34 (J/K) V = 3.72 (cc) Cp = 15.72 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.97 | 16.92 | 25.11 |

biotite mass = 2.54 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -40272.32 (J) H = -34605.30 (J) S = 5.49 (J/K) V = 0.92 (cc) Cp = 3.21 (J/K)

| annite | phlogopite |
|---|---|
| 2.83 | 97.17 |

feldspar mass = 37.84 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -605503.07 (J) H = -523490.22 (J) S = 79.38 (J/K) V = 14.51 (cc) Cp = 46.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.01 | 16.09 | 9.90 |

feldspar mass = 6.06 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -94006.83 (J) H = -81133.61 (J) S = 12.46 (J/K) V = 2.38 (cc) Cp = 7.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.96 | 1.34 | 68.70 |

quartz mass = 27.46 (gm) density = 2.60 (gm/cc)
SiO2
G = -442351.10 (J) H = -387105.96 (J) S = 53.47 (J/K) V = 10.56 (cc) Cp = 37.00 (J/K)

rhm-oxide mass = 0.96 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.79Mg0.11Fe'"0.08Al0.10Ti0.91O3
G = -9370.92 (J) H = -7610.24 (J) S = 1.70 (J/K) V = 0.21 (cc) Cp = 0.89 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.14 | 4.19 | 79.04 | 0.88 | 4.76 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -156.57 (J) H = -134.20 (J) S = 0.02 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 89.55 (gm) density = 2.77 (gm/cc)
G = -1387654.83 (J) H = -1201827.91 (J) S = 179.86 (J/K) V = 32.30 (cc) Cp = 110.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.72 (gm/cc)
G = -1556014.50 (J) H = -1340765.79 (J) S = 208.34 (J/K) V = 36.77 (cc) Cp = 124.79 (J/K)

Oxygen delta moles = -0.00202101 delta grams = -0.06467
G = 462.72 (J) H = -48.22 (J) S = -0.49 (J/K) V = -173.60 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 9.13 (gm) density = 2.31 (gm/cc) viscosity = 3.70 (log 10 poise) (analysis in wt %)
G = -148401.07 (J) H = -122278.76 (J) S = 25.53 (J/K) V = 3.96 (cc) Cp = 12.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.08 | 0.19 | 13.42 | 0.11 | 0.00 | 0.34 | 0.07 | 0.10 | 0.00 | 0.00 | 2.20 | 4.64 | 4.02 | 1.09 | 9.74 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.53 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -193385.99 (J) H = -165862.43 (J) S = 26.90 (J/K) V = 3.68 (cc) Cp = 15.53 (J/K)

almandine grossular pyrope
58.61 16.99 24.40

biotite mass = 2.69 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -42515.27 (J) H = -36615.15 (J) S = 5.77 (J/K) V = 0.97 (cc) Cp = 3.39 (J/K)
annite phlogopite
2.89 97.11

feldspar mass = 37.89 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.16Al1.16Si2.84O8
G = -605687.23 (J) H = -524829.17 (J) S = 79.03 (J/K) V = 14.52 (cc) Cp = 46.75 (J/K)
albite anorthite sanidine
74.28 16.34 9.37

feldspar mass = 6.78 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -104840.46 (J) H = -90686.65 (J) S = 13.83 (J/K) V = 2.66 (cc) Cp = 8.02 (J/K)
albite anorthite sanidine
28.94 1.24 69.82

quartz mass = 27.95 (gm) density = 2.60 (gm/cc)
SiO2
G = -449615.37 (J) H = -394312.54 (J) S = 54.05 (J/K) V = 10.73 (cc) Cp = 37.33 (J/K)

rhm-oxide mass = 0.97 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.80Mg0.11Fe"'0.08Al0.10Ti0.91O3
G = -9459.68 (J) H = -7705.52 (J) S = 1.71 (J/K) V = 0.21 (cc) Cp = 0.90 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.76 3.96 79.56 0.88 4.85

apatite mass = 0.00 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -27.56 (J) H = -23.68 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Total solids mass = 90.80 (gm) density = 2.77 (gm/cc)
G = -1405531.56 (J) H = -1220035.14 (J) S = 181.30 (J/K) V = 32.77 (cc) Cp = 111.92 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.72 (gm/cc)
G = -1553932.63 (J) H = -1342313.90 (J) S = 206.83 (J/K) V = 36.73 (cc) Cp = 124.70 (J/K)

Oxygen delta moles = -0.00203249 delta grams = -0.0650372
G = 460.38 (J) H = -47.78 (J) S = -0.50 (J/K) V = -172.90 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 740.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.28 COH = 0.76
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 7.83 (gm) density = 2.28 (gm/cc) viscosity = 3.18 (log 10 poise) (analysis in wt %)
G = -127672.65 (J) H = -104878.56 (J) S = 22.50 (J/K) V = 3.43 (cc) Cp = 11.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.95 | 0.15 | 13.67 | 0.11 | 0.00 | 0.33 | 0.08 | 0.09 | 0.00 | 0.00 | 2.38 | 4.99 | 3.66 | 1.28 | 11.30 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.40 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -191062.52 (J) H = -164214.51 (J) S = 26.50 (J/K) V = 3.64 (cc) Cp = 15.36 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.19 | 16.98 | 23.83 |

biotite mass = 2.81 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -44336.23 (J) H = -38270.25 (J) S = 5.99 (J/K) V = 1.01 (cc) Cp = 3.53 (J/K)

| annite | phlogopite |
|---|---|
| 2.90 | 97.10 |

feldspar mass = 37.96 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.75Ca0.17Al1.17Si2.83O8
G = -606319.20 (J) H = -526560.04 (J) S = 78.72 (J/K) V = 14.54 (cc) Cp = 47.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.53 | 16.61 | 8.86 |

feldspar mass = 7.49 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -115702.18 (J) H = -100306.12 (J) S = 15.20 (J/K) V = 2.94 (cc) Cp = 8.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.92 | 1.15 | 70.93 |

quartz mass = 28.46 (gm) density = 2.61 (gm/cc)
SiO2
G = -457234.86 (J) H = -401854.36 (J) S = 54.66 (J/K) V = 10.91 (cc) Cp = 37.69 (J/K)

rhm-oxide mass = 0.98 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.80Mg0.10Fe'"0.07Al0.10Ti0.91O3
G = -9538.37 (J) H = -7793.58 (J) S = 1.72 (J/K) V = 0.21 (cc) Cp = 0.90 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.43 | 3.73 | 80.02 | 0.86 | 4.95 |

Total solids mass = 92.11 (gm) density = 2.77 (gm/cc)
G = -1424193.37 (J) H = -1238998.85 (J) S = 182.79 (J/K) V = 33.26 (cc) Cp = 113.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.72 (gm/cc)
G = -1551866.02 (J) H = -1343877.41 (J) S = 205.29 (J/K) V = 36.69 (cc) Cp = 124.74 (J/K)

Oxygen delta moles = -0.00204397 delta grams = -0.0654045
G = 457.99 (J) H = -47.34 (J) S = -0.50 (J/K) V = -172.18 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 730.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.29  COH = 0.72
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 6.43 (gm)  density = 2.24 (gm/cc)  viscosity = 2.47 (log 10 poise)  (analysis in wt %)
G = -105535.73 (J)  H = -86191.69 (J)  S = 19.28 (J/K)  V = 2.87 (cc)  Cp = 9.33 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.68 | 0.11 | 13.95 | 0.11 | 0.00 | 0.33 | 0.09 | 0.07 | 0.00 | 0.00 | 2.66 | 5.55 | 3.17 | 1.56 | 13.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.30 (gm)  density = 3.96 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.60Mg0.23)3Al2Si3O12
G = -189055.68 (J)  H = -162833.41 (J)  S = 26.14 (J/K)  V = 3.61 (cc)  Cp = 15.21 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.73 | 16.85 | 23.42 |

biotite  mass = 2.90 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -45662.26 (J)  H = -39505.37 (J)  S = 6.14 (J/K)  V = 1.05 (cc)  Cp = 3.64 (J/K)

| annite | phlogopite |
|---|---|
| 2.84 | 97.16 |

feldspar  mass = 38.09 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.75Ca0.17Al1.17Si2.83O8
G = -607804.68 (J)  H = -529040.52 (J)  S = 78.52 (J/K)  V = 14.58 (cc)  Cp = 47.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.72 | 16.90 | 8.37 |

feldspar  mass = 8.22 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -126702.50 (J)  H = -110088.29 (J)  S = 16.56 (J/K)  V = 3.22 (cc)  Cp = 9.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.91 | 1.06 | 72.03 |

quartz  mass = 29.00 (gm)  density = 2.61 (gm/cc)
SiO2
G = -465445.96 (J)  H = -409941.44 (J)  S = 55.33 (J/K)  V = 11.11 (cc)  Cp = 38.10 (J/K)

rhm-oxide  mass = 0.99 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.80Mg0.10Fe'"0.07Al0.10Ti0.91O3
G = -9608.14 (J)  H = -7875.41 (J)  S = 1.73 (J/K)  V = 0.22 (cc)  Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.17 | 3.49 | 80.40 | 0.84 | 5.10 |

Total solids  mass = 93.50 (gm)  density = 2.77 (gm/cc)
G = -1444279.22 (J)  H = -1259284.43 (J)  S = 184.41 (J/K)  V = 33.78 (cc)  Cp = 115.61 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.73 (gm/cc)
G = -1549814.95 (J)  H = -1345476.11 (J)  S = 203.70 (J/K)  V = 36.64 (cc)  Cp = 124.94 (J/K)

Oxygen delta moles = -0.00205568 delta grams = -0.0657793
G = 455.60 (J) H = -46.89 (J) S = -0.50 (J/K) V = -171.45 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 720.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = -0.31 COH = 0.68 IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 5.10 (gm) density = 2.19 (gm/cc) viscosity = 1.59 (log 10 poise) (analysis in wt %)
G = -84466.79 (J) H = -68357.91 (J) S = 16.22 (J/K) V = 2.33 (cc) Cp = 7.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.94 | 0.07 | 14.21 | 0.11 | 0.00 | 0.32 | 0.12 | 0.06 | 0.00 | 0.00 | 3.08 | 6.31 | 2.58 | 1.97 | 17.21 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.21 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.60Mg0.23)3Al2Si3O12
G = -187326.34 (J) H = -161686.27 (J) S = 25.82 (J/K) V = 3.58 (cc) Cp = 15.09 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.21 | 16.63 | 23.15 |

biotite mass = 2.96 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -46554.99 (J) H = -40370.88 (J) S = 6.23 (J/K) V = 1.07 (cc) Cp = 3.71 (J/K)

| annite | phlogopite |
|---|---|
| 2.74 | 97.26 |

feldspar mass = 38.30 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.08Na0.75Ca0.17Al1.17Si2.83O8
G = -610447.66 (J) H = -532541.04 (J) S = 78.44 (J/K) V = 14.65 (cc) Cp = 48.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.89 | 17.20 | 7.90 |

feldspar mass = 8.85 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.73Na0.26Ca0.01Al1.01Si2.99O8
G = -136191.77 (J) H = -118597.44 (J) S = 17.72 (J/K) V = 3.47 (cc) Cp = 10.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 25.91 | 0.98 | 73.11 |

quartz mass = 29.52 (gm) density = 2.61 (gm/cc)
SiO2
G = -473135.09 (J) H = -417594.08 (J) S = 55.92 (J/K) V = 11.29 (cc) Cp = 38.46 (J/K)

rhm-oxide mass = 1.00 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.81Mg0.10Fe'"0.06Al0.11Ti0.91O3
G = -9657.35 (J) H = -7941.22 (J) S = 1.73 (J/K) V = 0.22 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.97 | 3.25 | 80.71 | 0.80 | 5.28 |

Total solids mass = 94.83 (gm) density = 2.77 (gm/cc)

G = -1463313.20 (J)  H = -1278730.93 (J)  S = 185.86 (J/K)  V = 34.27 (cc)  Cp = 117.71 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.73 (gm/cc)
G = -1547779.98 (J)  H = -1347088.84 (J)  S = 202.08 (J/K)  V = 36.60 (cc)  Cp = 125.34 (J/K)

Oxygen  delta moles = -0.00206748  delta grams = -0.0661569
G = 453.18 (J)  H = -46.44 (J)  S = -0.50 (J/K)  V = -170.72 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 710.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -16.00  delta HM = -5.22  NNO = 0.00  QFM = -0.32  COH = 0.64
IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid  mass = 4.23 (gm)  density = 2.14 (gm/cc)  viscosity = 0.90 (log 10 poise)  (analysis in wt %)
G = -70633.97 (J)  H = -56701.67 (J)  S = 14.17 (J/K)  V = 1.98 (cc)  Cp = 6.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 49.32 | 0.05 | 14.38 | 0.11 | 0.00 | 0.31 | 0.15 | 0.05 | 0.00 | 0.00 | 3.49 | 6.94 | 2.13 | 2.37 | 20.69 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.13 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.16Fe"0.61Mg0.23)3Al2Si3O12
G = -185680.57 (J)  H = -160606.67 (J)  S = 25.50 (J/K)  V = 3.56 (cc)  Cp = 14.97 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.69 | 16.45 | 22.86 |

biotite  mass = 3.02 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -47451.49 (J)  H = -41242.97 (J)  S = 6.31 (J/K)  V = 1.09 (cc)  Cp = 3.78 (J/K)

| annite | phlogopite |
|---|---|
| 2.64 | 97.36 |

feldspar  mass = 38.50 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.07Na0.75Ca0.17Al1.17Si2.83O8
G = -613026.53 (J)  H = -535997.46 (J)  S = 78.35 (J/K)  V = 14.71 (cc)  Cp = 50.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.11 | 17.42 | 7.48 |

feldspar  mass = 9.22 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.74Na0.25Ca0.01Al1.01Si2.99O8
G = -141519.77 (J)  H = -123511.63 (J)  S = 18.32 (J/K)  V = 3.61 (cc)  Cp = 11.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 24.99 | 0.91 | 74.10 |

quartz  mass = 29.84 (gm)  density = 2.62 (gm/cc)
SiO2
G = -477778.19 (J)  H = -422576.74 (J)  S = 56.15 (J/K)  V = 11.40 (cc)  Cp = 38.58 (J/K)

rhm-oxide  mass = 1.00 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)

Mn0.01Fe"0.81Mg0.10Fe'"0.06Al0.11Ti0.92O3
G = -9671.09 (J) H = -7977.61 (J) S = 1.72 (J/K) V = 0.22 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.76 | 3.04 | 81.00 | 0.77 | 5.44 |

Total solids mass = 95.70 (gm) density = 2.77 (gm/cc)
G = -1475127.63 (J) H = -1291913.09 (J) S = 186.35 (J/K) V = 34.59 (cc) Cp = 119.37 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.73 (gm/cc)
G = -1545761.61 (J) H = -1348614.76 (J) S = 200.53 (J/K) V = 36.56 (cc) Cp = 125.89 (J/K)

Oxygen delta moles = -0.00207799 delta grams = -0.0664932
G = 450.43 (J) H = -45.95 (J) S = -0.50 (J/K) V = -169.86 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: f8p2

T = 700.00 (C) P = 8.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = -0.34 COH = 0.60 IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 3.60 (gm) density = 2.10 (gm/cc) viscosity = 0.39 (log 10 poise) (analysis in wt %)
G = -60463.85 (J) H = -48231.83 (J) S = 12.57 (J/K) V = 1.72 (cc) Cp = 5.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45.56 | 0.04 | 13.98 | 0.11 | 0.00 | 0.29 | 0.18 | 0.04 | 0.00 | 0.00 | 3.93 | 7.59 | 1.79 | 2.79 | 23.71 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.02 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.61Mg0.22)3Al2Si3O12
G = -183682.35 (J) H = -159220.26 (J) S = 25.14 (J/K) V = 3.53 (cc) Cp = 14.82 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.20 | 16.85 | 21.95 |

biotite mass = 3.17 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -49778.44 (J) H = -43361.02 (J) S = 6.59 (J/K) V = 1.14 (cc) Cp = 3.96 (J/K)

| annite | phlogopite |
|---|---|
| 2.72 | 97.28 |

muscovite mass = 0.33 (gm) density = 2.80 (gm/cc)
KAl2Si3AlO10(OH)2
G = -5213.12 (J) H = -4573.97 (J) S = 0.66 (J/K) V = 0.12 (cc) Cp = 0.42 (J/K)

feldspar mass = 38.63 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.76Ca0.17Al1.17Si2.83O8
G = -614367.89 (J) H = -538369.32 (J) S = 78.10 (J/K) V = 14.76 (cc) Cp = 51.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.56 | 17.29 | 7.15 |

feldspar mass = 9.05 (gm) density = 2.55 (gm/cc) (analysis in mole %)

K0.75Na0.24Ca0.01Al1.01Si2.99O8
G = -138719.94 (J)  H = -121336.34 (J)  S = 17.86 (J/K)  V = 3.55 (cc)  Cp = 10.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 24.27 | 0.83 | 74.90 |

quartz mass = 30.13 (gm)  density = 2.62 (gm/cc)
SiO2
G = -481893.50 (J)  H = -427104.36 (J)  S = 56.30 (J/K)  V = 11.49 (cc)  Cp = 38.66 (J/K)

rhm-oxide mass = 1.00 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.82Mg0.09Fe'"0.06Al0.11Ti0.92O3
G = -9641.66 (J)  H = -7974.98 (J)  S = 1.71 (J/K)  V = 0.22 (cc)  Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.38 | 2.92 | 81.59 | 0.76 | 5.35 |

Total solids mass = 96.33 (gm)  density = 2.77 (gm/cc)
G = -

**********----------**********
Title: felsic

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.41 (gm/cc)  viscosity = 4.20 (log 10 poise)  (analysis in wt %)
G = -1709858.08 (J)  H = -1265480.42 (J)  S = 282.48 (J/K)  V = 41.41 (cc)  Cp = 143.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.69 | 0.00 | 3.24 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.20 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.41 (gm/cc)
G = -1709858.08 (J)  H = -1265480.42 (J)  S = 282.48 (J/K)  V = 41.41 (cc)  Cp = 143.14 (J/K)

Oxygen  delta moles = 8.32667e-17  delta grams = 2.66444e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -1707039.41 (J)  H = -1266913.08 (J)  S = 281.56 (J/K)  V = 41.38 (cc)  Cp = 143.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.69 | 0.00 | 3.24 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1707039.41 (J)  H = -1266913.08 (J)  S = 281.56 (J/K)  V = 41.38 (cc)  Cp = 143.13 (J/K)

Oxygen  delta moles = 2.83236e-06  delta grams = 9.06321e-05
G = -1.03 (J)  H = 0.12 (J)  S = 0.00 (J/K)  V = 0.37 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1704230.06 (J)  H = -1268345.82 (J)  S = 280.65 (J/K)  V = 41.36 (cc)  Cp = 143.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.24 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1704230.06 (J)  H = -1268345.82 (J)  S = 280.65 (J/K)  V = 41.36 (cc)  Cp = 143.13 (J/K)

Oxygen  delta moles = 5.95719e-06  delta grams = 0.000190623
G = -2.15 (J)  H = 0.25 (J)  S = 0.00 (J/K)  V = 0.77 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1701430.09 (J)  H = -1269778.63 (J)  S = 279.72 (J/K)  V = 41.33 (cc)  Cp = 143.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.24 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1701430.09 (J)  H = -1269778.63 (J)  S = 279.72 (J/K)  V = 41.33 (cc)  Cp = 143.12 (J/K)

Oxygen  delta moles = 9.38277e-06  delta grams = 0.000300237
G = -3.36 (J)  H = 0.40 (J)  S = 0.00 (J/K)  V = 1.20 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.43 (log 10 poise)  (analysis in wt %)
G = -1698639.55 (J)  H = -1271211.52 (J)  S = 278.79 (J/K)  V = 41.30 (cc)  Cp = 143.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.24 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1698639.55 (J)  H = -1271211.52 (J)  S = 278.79 (J/K)  V = 41.30 (cc)  Cp = 143.11 (J/K)

Oxygen  delta moles = 1.31177e-05  delta grams = 0.000419752
G = -4.66 (J)  H = 0.55 (J)  S = 0.00 (J/K)  V = 1.67 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.42 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1695858.52 (J)  H = -1272644.51 (J)  S = 277.85 (J/K)  V = 41.27 (cc)  Cp = 143.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.24 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.42 (gm/cc)
G = -1695858.52 (J)  H = -1272644.51 (J)  S = 277.85 (J/K)  V = 41.27 (cc)  Cp = 143.11 (J/K)

Oxygen  delta moles = 1.71711e-05  delta grams = 0.000549454
G = -6.05 (J)  H = 0.71 (J)  S = 0.00 (J/K)  V = 2.17 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.42 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -1693087.05 (J) H = -1274077.59 (J) S = 276.91 (J/K) V = 41.24 (cc) Cp = 143.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.23 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System mass = 100.00 (gm) density = 2.42 (gm/cc)
G = -1693087.05 (J) H = -1274077.59 (J) S = 276.91 (J/K) V = 41.24 (cc) Cp = 143.10 (J/K)

Oxygen delta moles = 2.15522e-05 delta grams = 0.000689644
G = -7.54 (J) H = 0.89 (J) S = 0.01 (J/K) V = 2.71 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1690325.22 (J) H = -1275510.78 (J) S = 275.96 (J/K) V = 41.21 (cc) Cp = 143.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.23 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1690325.22 (J) H = -1275510.78 (J) S = 275.96 (J/K) V = 41.21 (cc) Cp = 143.10 (J/K)

Oxygen delta moles = 2.62708e-05 delta grams = 0.000840634
G = -9.12 (J) H = 1.07 (J) S = 0.01 (J/K) V = 3.28 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1220.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.37 COH = 2.39 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1687573.09 (J) H = -1276944.07 (J) S = 275.01 (J/K) V = 41.18 (cc) Cp = 143.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.23 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1687573.09 (J) H = -1276944.07 (J) S = 275.01 (J/K) V = 41.18 (cc) Cp = 143.09 (J/K)

Oxygen delta moles = 3.13371e-05 delta grams = 0.00100275
G = -10.80 (J) H = 1.26 (J) S = 0.01 (J/K) V = 3.89 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1210.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.37 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1684830.73 (J) H = -1278377.49 (J) S = 274.05 (J/K) V = 41.16 (cc) Cp = 143.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.71 | 0.00 | 3.23 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1684830.73 (J) H = -1278377.49 (J) S = 274.05 (J/K) V = 41.16 (cc) Cp = 143.08 (J/K)

Oxygen delta moles = 3.67618e-05 delta grams = 0.00117633
G = -12.58 (J) H = 1.47 (J) S = 0.01 (J/K) V = 4.53 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1200.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.35 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1682098.09 (J) H = -1279757.06 (J) S = 273.12 (J/K) V = 41.13 (cc) Cp = 135.19 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.71 0.00 3.23 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1682098.09 (J) H = -1279757.06 (J) S = 273.12 (J/K) V = 41.13 (cc) Cp = 135.19 (J/K)

Oxygen delta moles = 4.2556e-05 delta grams = 0.00136174
G = -14.45 (J) H = 1.69 (J) S = 0.01 (J/K) V = 5.21 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1190.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.34 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1679374.85 (J) H = -1281111.79 (J) S = 272.20 (J/K) V = 41.10 (cc) Cp = 135.17 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.71 0.00 3.23 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1679374.85 (J) H = -1281111.79 (J) S = 272.20 (J/K) V = 41.10 (cc) Cp = 135.17 (J/K)

Oxygen delta moles = 4.87312e-05 delta grams = 0.00155934
G = -16.42 (J) H = 1.91 (J) S = 0.01 (J/K) V = 5.93 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.43 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1676661.06 (J) H = -1282466.46 (J) S = 271.27 (J/K) V = 41.07 (cc) Cp = 135.14 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.71 0.00 3.22 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.43 (gm/cc)
G = -1676661.06 (J) H = -1282466.46 (J) S = 271.27 (J/K) V = 41.07 (cc) Cp = 135.14 (J/K)

Oxygen delta moles = 5.52996e-05 delta grams = 0.00176952
G = -18.49 (J) H = 2.15 (J) S = 0.01 (J/K) V = 6.68 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1170.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.35 COH = 2.30 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1673956.78 (J) H = -1283821.07 (J) S = 270.34 (J/K) V = 41.04 (cc) Cp = 135.12 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.71 0.00 3.22 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1673956.78 (J) H = -1283821.07 (J) S = 270.34 (J/K) V = 41.04 (cc) Cp = 135.12 (J/K)

Oxygen delta moles = 6.22739e-05 delta grams = 0.00199269
G = -20.67 (J) H = 2.40 (J) S = 0.02 (J/K) V = 7.47 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1160.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.35 COH = 2.29 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1671262.07 (J) H = -1285175.60 (J) S = 269.40 (J/K) V = 41.01 (cc) Cp = 135.09 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

70.61 0.43 13.88 0.72 0.00 3.22 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1671262.07 (J) H = -1285175.60 (J) S = 269.40 (J/K) V = 41.01 (cc) Cp = 135.09 (J/K)

Oxygen delta moles = 6.96671e-05 delta grams = 0.00222926
G = -22.94 (J) H = 2.66 (J) S = 0.02 (J/K) V = 8.30 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1150.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.34 COH = 2.27 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1668577.02 (J) H = -1286530.06 (J) S = 268.45 (J/K) V = 40.98 (cc) Cp = 135.06 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.72 0.00 3.22 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1668577.02 (J) H = -1286530.06 (J) S = 268.45 (J/K) V = 40.98 (cc) Cp = 135.06 (J/K)

Oxygen delta moles = 7.74933e-05 delta grams = 0.00247969
G = -25.32 (J) H = 2.93 (J) S = 0.02 (J/K) V = 9.17 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1140.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.34 COH = 2.25 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1665901.69 (J) H = -1287884.44 (J) S = 267.50 (J/K) V = 40.96 (cc) Cp = 135.03 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.60 0.43 13.88 0.72 0.00 3.22 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1665901.69 (J) H = -1287884.44 (J) S = 267.50 (J/K) V = 40.96 (cc) Cp = 135.03 (J/K)

Oxygen delta moles = 8.57668e-05 delta grams = 0.00274444
G = -27.80 (J) H = 3.21 (J) S = 0.02 (J/K) V = 10.08 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1130.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.33 COH = 2.23 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -1663236.16 (J) H = -1289238.74 (J) S = 266.54 (J/K) V = 40.93 (cc) Cp = 134.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.60 | 0.43 | 13.88 | 0.72 | 0.00 | 3.21 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1663236.16 (J) H = -1289238.74 (J) S = 266.54 (J/K) V = 40.93 (cc) Cp = 134.99 (J/K)

Oxygen delta moles = 9.45028e-05 delta grams = 0.00302398
G = -30.39 (J) H = 3.50 (J) S = 0.02 (J/K) V = 11.02 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1120.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.22 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 5.37 (log 10 poise) (analysis in wt %)
G = -1660580.50 (J) H = -1290592.95 (J) S = 265.58 (J/K) V = 40.90 (cc) Cp = 134.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.60 | 0.43 | 13.88 | 0.73 | 0.00 | 3.21 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1660580.50 (J)  H = -1290592.95 (J)  S = 265.58 (J/K)  V = 40.90 (cc)  Cp = 134.96 (J/K)

Oxygen  delta moles = 0.000103717  delta grams = 0.00331882
G = -33.09 (J)  H = 3.81 (J)  S = 0.03 (J/K)  V = 12.01 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1110.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.20  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 5.45 (log 10 poise)  (analysis in wt %)
G = -1657934.77 (J)  H = -1291947.08 (J)  S = 264.60 (J/K)  V = 40.87 (cc)  Cp = 134.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.60 | 0.43 | 13.88 | 0.73 | 0.00 | 3.21 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1657934.77 (J)  H = -1291947.08 (J)  S = 264.60 (J/K)  V = 40.87 (cc)  Cp = 134.93 (J/K)

Oxygen  delta moles = 0.000113426  delta grams = 0.00362951
G = -35.90 (J)  H = 4.12 (J)  S = 0.03 (J/K)  V = 13.04 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1100.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.31  COH = 2.18  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.78 (gm)  density = 2.45 (gm/cc)  viscosity = 5.54 (log 10 poise)  (analysis in wt %)
G = -1651871.63 (J)  H = -1290683.14 (J)  S = 263.04 (J/K)  V = 40.77 (cc)  Cp = 134.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.64 | 0.43 | 13.90 | 0.73 | 0.00 | 3.17 | 0.08 | 1.29 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.23 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.33Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -3417.46 (J)  H = -2694.12 (J)  S = 0.53 (J/K)  V = 0.07 (cc)  Cp = 0.28 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-59.74 96.46 57.21 3.65 -3.45 5.59 0.29

Total solids mass = 0.23 (gm) density = 3.35 (gm/cc)
G = -3417.46 (J) H = -2694.12 (J) S = 0.53 (J/K) V = 0.07 (cc) Cp = 0.28 (J/K)

Viscosity of the System: 5.54 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1655289.09 (J) H = -1293377.26 (J) S = 263.56 (J/K) V = 40.83 (cc) Cp = 134.82 (J/K)

Oxygen delta moles = 0.000105033 delta grams = 0.00336094
G = -32.97 (J) H = 3.78 (J) S = 0.03 (J/K) V = 11.99 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1090.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.16 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 99.35 (gm) density = 2.45 (gm/cc) viscosity = 5.64 (log 10 poise) (analysis in wt %)
G = -1642967.17 (J) H = -1287228.15 (J) S = 260.97 (J/K) V = 40.59 (cc) Cp = 133.86 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.72 0.43 13.95 0.72 0.00 3.11 0.08 1.20 0.00 0.00 2.66 4.29 1.68 0.14 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.65 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.59Mg1.31Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -9677.35 (J) H = -7641.01 (J) S = 1.49 (J/K) V = 0.19 (cc) Cp = 0.79 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-61.87 96.31 59.33 3.75 -3.56 5.73 0.30

Total solids mass = 0.65 (gm) density = 3.36 (gm/cc)
G = -9677.35 (J) H = -7641.01 (J) S = 1.49 (J/K) V = 0.19 (cc) Cp = 0.79 (J/K)

Viscosity of the System: 5.65 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1652644.52 (J) H = -1294869.16 (J) S = 262.46 (J/K) V = 40.79 (cc) Cp = 134.64 (J/K)

Oxygen delta moles = 7.87505e-05 delta grams = 0.00251992
G = -24.52 (J) H = 2.80 (J) S = 0.02 (J/K) V = 8.93 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1080.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.30 COH = 2.14 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 98.94 (gm) density = 2.45 (gm/cc) viscosity = 5.75 (log 10 poise) (analysis in wt %)
G = -1634270.70 (J) H = -1283908.01 (J) S = 258.92 (J/K) V = 40.43 (cc) Cp = 133.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.80 | 0.44 | 14.00 | 0.71 | 0.00 | 3.05 | 0.08 | 1.11 | 0.00 | 0.00 | 2.67 | 4.31 | 1.68 | 0.14 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.06 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.62Mg1.28Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -15739.07 (J) H = -12446.60 (J) S = 2.43 (J/K) V = 0.32 (cc) Cp = 1.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.05 | 96.16 | 61.50 | 3.87 | -3.67 | 5.88 | 0.31 |

Total solids mass = 1.06 (gm) density = 3.37 (gm/cc)
G = -15739.07 (J) H = -12446.60 (J) S = 2.43 (J/K) V = 0.32 (cc) Cp = 1.29 (J/K)

Viscosity of the System: 5.76 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1650009.77 (J) H = -1296354.62 (J) S = 261.36 (J/K) V = 40.74 (cc) Cp = 134.47 (J/K)

Oxygen delta moles = 5.02148e-05 delta grams = 0.00160681
G = -15.51 (J) H = 1.77 (J) S = 0.01 (J/K) V = 5.65 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1070.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.30 COH = 2.12 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 98.53 (gm) density = 2.45 (gm/cc) viscosity = 5.85 (log 10 poise) (analysis in wt %)
G = -1625767.40 (J) H = -1280712.14 (J) S = 256.90 (J/K) V = 40.26 (cc) Cp = 132.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.88 | 0.44 | 14.05 | 0.70 | 0.00 | 2.98 | 0.08 | 1.02 | 0.00 | 0.00 | 2.68 | 4.33 | 1.69 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.47 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.64Mg1.26Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -21617.44 (J) H = -17121.88 (J) S = 3.35 (J/K) V = 0.44 (cc) Cp = 1.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.28 | 96.02 | 63.71 | 3.99 | -3.79 | 6.04 | 0.32 |

Total solids mass = 1.47 (gm) density = 3.38 (gm/cc)
G = -21617.44 (J) H = -17121.88 (J) S = 3.35 (J/K) V = 0.44 (cc) Cp = 1.77 (J/K)

Viscosity of the System: 5.87 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1647384.83 (J) H = -1297834.02 (J) S = 260.25 (J/K) V = 40.70 (cc) Cp = 134.31 (J/K)

Oxygen delta moles = 1.93127e-05 delta grams = 0.000617983

G = -5.92 (J)  H = 0.67 (J)  S = 0.00 (J/K)  V = 2.16 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1060.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.29  COH = 2.10  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.26 (gm)  density = 2.45 (gm/cc)  viscosity = 5.96 (log 10 poise)  (analysis in wt %)
G = -1603016.72 (J)  H = -1266183.80 (J)  S = 252.66 (J/K)  V = 39.76 (cc)  Cp = 130.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.06 | 0.44 | 14.02 | 0.69 | 0.00 | 2.91 | 0.08 | 0.94 | 0.00 | 0.00 | 2.65 | 4.32 | 1.71 | 0.14 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.93 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.66Mg1.23Fe'''0.02Ti0.00Al0.11Si1.94O6
G = -28166.18 (J)  H = -22340.13 (J)  S = 4.37 (J/K)  V = 0.57 (cc)  Cp = 2.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.91 | 95.94 | 66.27 | 4.08 | -3.88 | 6.17 | 0.33 |

feldspar  mass = 0.80 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.02Na0.68Ca0.30Al1.30Si2.70O8
G = -13581.68 (J)  H = -11008.40 (J)  S = 1.93 (J/K)  V = 0.31 (cc)  Cp = 0.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.45 | 29.53 | 2.02 |

Total solids  mass = 2.74 (gm)  density = 3.12 (gm/cc)
G = -41747.87 (J)  H = -33348.53 (J)  S = 6.30 (J/K)  V = 0.88 (cc)  Cp = 3.30 (J/K)

Viscosity of the System: 6.00 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1644764.58 (J)  H = -1299532.33 (J)  S = 258.96 (J/K)  V = 40.64 (cc)  Cp = 133.98 (J/K)

Oxygen  delta moles = -2.38961e-05  delta grams = -0.000764645
G = 7.26 (J)  H = -0.82 (J)  S = -0.01 (J/K)  V = -2.65 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1050.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.29  COH = 2.08  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.58 (gm)  density = 2.44 (gm/cc)  viscosity = 6.07 (log 10 poise)  (analysis in wt %)
G = -1540151.00 (J)  H = -1219668.69 (J)  S = 242.21 (J/K)  V = 38.31 (cc)  Cp = 125.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.52 | 0.46 | 13.75 | 0.68 | 0.00 | 2.88 | 0.09 | 0.85 | 0.00 | 0.00 | 2.56 | 4.22 | 1.76 | 0.15 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.55 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.20Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -36724.25 (J) H = -29156.40 (J) S = 5.72 (J/K) V = 0.75 (cc) Cp = 3.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.64 | 96.05 | 69.86 | 4.06 | -3.87 | 6.21 | 0.32 |

feldspar mass = 3.87 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.02Na0.69Ca0.29Al1.29Si2.71O8
G = -65267.58 (J) H = -53017.35 (J) S = 9.26 (J/K) V = 1.49 (cc) Cp = 4.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.20 | 28.67 | 2.12 |

Total solids mass = 6.42 (gm) density = 2.87 (gm/cc)
G = -101991.83 (J) H = -82173.75 (J) S = 14.98 (J/K) V = 2.24 (cc) Cp = 7.77 (J/K)

Viscosity of the System: 6.17 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1642142.83 (J) H = -1301842.44 (J) S = 257.19 (J/K) V = 40.54 (cc) Cp = 133.20 (J/K)

Oxygen delta moles = -9.94272e-05 delta grams = -0.00318155
G = 29.95 (J) H = -3.40 (J) S = -0.03 (J/K) V = -10.94 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1040.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.28 COH = 2.06 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 90.13 (gm) density = 2.44 (gm/cc) viscosity = 6.18 (log 10 poise) (analysis in wt %)
G = -1481524.74 (J) H = -1176298.02 (J) S = 232.44 (J/K) V = 36.95 (cc) Cp = 120.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.97 | 0.48 | 13.49 | 0.68 | 0.00 | 2.84 | 0.09 | 0.77 | 0.00 | 0.00 | 2.47 | 4.12 | 1.82 | 0.16 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.13 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.73Mg1.16Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -44655.30 (J) H = -35488.66 (J) S = 6.98 (J/K) V = 0.91 (cc) Cp = 3.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.36 | 96.16 | 73.43 | 4.05 | -3.86 | 6.26 | 0.32 |

feldspar mass = 6.74 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.02Na0.70Ca0.28Al1.28Si2.72O8
G = -113356.88 (J) H = -92283.17 (J) S = 16.05 (J/K) V = 2.59 (cc) Cp = 8.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.88 | 27.90 | 2.22 |

Total solids mass = 9.86 (gm) density = 2.81 (gm/cc)
G = -158012.18 (J) H = -127771.83 (J) S = 23.03 (J/K) V = 3.50 (cc) Cp = 11.94 (J/K)

Viscosity of the System: 6.34 (log 10 poise)

System mass = 99.99 (gm) density = 2.47 (gm/cc)
G = -1639536.92 (J) H = -1304069.85 (J) S = 255.47 (J/K) V = 40.45 (cc) Cp = 132.47 (J/K)

Oxygen delta moles = -0.000178051 delta grams = -0.00569743
G = 53.18 (J) H = -6.02 (J) S = -0.05 (J/K) V = -19.44 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1030.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.27 COH = 2.04 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 83.87 (gm) density = 2.44 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -1376281.30 (J) H = -1094932.91 (J) S = 215.90 (J/K) V = 34.42 (cc) Cp = 112.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 72.02 | 0.51 | 13.39 | 0.68 | 0.00 | 2.85 | 0.10 | 0.70 | 0.00 | 0.00 | 2.40 | 4.06 | 1.93 | 0.17 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.79 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.77Mg1.12Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -53619.56 (J) H = -42650.77 (J) S = 8.42 (J/K) V = 1.10 (cc) Cp = 4.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.45 | 96.28 | 77.22 | 4.12 | -3.92 | 6.43 | 0.31 |

feldspar mass = 10.52 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.02Na0.70Ca0.27Al1.27Si2.73O8
G = -176762.68 (J) H = -144221.23 (J) S = 24.97 (J/K) V = 4.05 (cc) Cp = 12.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.26 | 27.36 | 2.39 |

quartz mass = 1.80 (gm) density = 2.55 (gm/cc)
SiO2
G = -30278.23 (J) H = -25003.44 (J) S = 4.05 (J/K) V = 0.71 (cc) Cp = 2.14 (J/K)

Total solids mass = 16.12 (gm) density = 2.75 (gm/cc)
G = -260660.47 (J) H = -211875.44 (J) S = 37.44 (J/K) V = 5.86 (cc) Cp = 19.58 (J/K)

Viscosity of the System: 6.51 (log 10 poise)

System mass = 99.99 (gm) density = 2.48 (gm/cc)
G = -1636941.77 (J) H = -1306808.35 (J) S = 253.33 (J/K) V = 40.28 (cc) Cp = 131.63 (J/K)

Oxygen delta moles = -0.000271424 delta grams = -0.00868523
G = 80.39 (J) H = -9.08 (J) S = -0.07 (J/K) V = -29.41 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1020.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.27 COH = 2.02 IW

= 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 77.28 (gm) density = 2.43 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -1265819.40 (J) H = -1008873.73 (J) S = 198.70 (J/K) V = 31.75 (cc) Cp = 103.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.91 | 0.56 | 13.35 | 0.69 | 0.00 | 2.86 | 0.10 | 0.64 | 0.00 | 0.00 | 2.34 | 4.01 | 2.07 | 0.18 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.45 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.81Mg1.08Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -62199.82 (J) H = -49521.97 (J) S = 9.80 (J/K) V = 1.29 (cc) Cp = 5.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.52 | 96.40 | 80.96 | 4.21 | -4.00 | 6.64 | 0.31 |

feldspar mass = 14.25 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.27Al1.27Si2.73O8
G = -239049.88 (J) H = -195477.14 (J) S = 33.70 (J/K) V = 5.48 (cc) Cp = 17.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.50 | 26.92 | 2.59 |

quartz mass = 4.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -67297.80 (J) H = -55695.76 (J) S = 8.97 (J/K) V = 1.57 (cc) Cp = 4.77 (J/K)

Total solids mass = 22.71 (gm) density = 2.72 (gm/cc)
G = -368547.50 (J) H = -300694.87 (J) S = 52.47 (J/K) V = 8.34 (cc) Cp = 27.53 (J/K)

Viscosity of the System: 6.68 (log 10 poise)

System mass = 99.99 (gm) density = 2.49 (gm/cc)
G = -1634366.90 (J) H = -1309568.60 (J) S = 251.17 (J/K) V = 40.09 (cc) Cp = 130.72 (J/K)

Oxygen delta moles = -0.000368473 delta grams = -0.0117907
G = 108.20 (J) H = -12.19 (J) S = -0.09 (J/K) V = -39.62 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1010.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.26 COH = 2.00 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 71.48 (gm) density = 2.43 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -1169020.79 (J) H = -933446.79 (J) S = 183.59 (J/K) V = 29.40 (cc) Cp = 95.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.81 | 0.60 | 13.31 | 0.70 | 0.00 | 2.85 | 0.11 | 0.58 | 0.00 | 0.00 | 2.29 | 3.95 | 2.21 | 0.20 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.05 (gm) density = 3.48 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.84Mg1.05Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -69860.84 (J) H = -55680.18 (J) S = 11.05 (J/K) V = 1.45 (cc) Cp = 5.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.36 | 96.52 | 84.46 | 4.30 | -4.08 | 6.85 | 0.30 |

feldspar mass = 17.53 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.27Al1.27Si2.73O8
G = -293555.51 (J) H = -240584.28 (J) S = 41.28 (J/K) V = 6.74 (cc) Cp = 21.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.70 | 26.52 | 2.78 |

quartz mass = 5.93 (gm) density = 2.55 (gm/cc)
SiO2
G = -99376.97 (J) H = -82424.59 (J) S = 13.21 (J/K) V = 2.33 (cc) Cp = 7.05 (J/K)

Total solids mass = 28.51 (gm) density = 2.71 (gm/cc)
G = -462793.31 (J) H = -378689.06 (J) S = 65.55 (J/K) V = 10.52 (cc) Cp = 34.49 (J/K)

Viscosity of the System: 6.86 (log 10 poise)

System mass = 99.99 (gm) density = 2.50 (gm/cc)
G = -1631814.10 (J) H = -1312135.85 (J) S = 249.14 (J/K) V = 39.93 (cc) Cp = 129.91 (J/K)

Oxygen delta moles = -0.000463622 delta grams = -0.0148354
G = 134.97 (J) H = -15.17 (J) S = -0.12 (J/K) V = -49.46 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1000.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.25 COH = 1.98 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 66.34 (gm) density = 2.43 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -1083562.87 (J) H = -866840.10 (J) S = 170.23 (J/K) V = 27.33 (cc) Cp = 88.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.72 | 0.65 | 13.28 | 0.69 | 0.00 | 2.81 | 0.12 | 0.53 | 0.00 | 0.00 | 2.24 | 3.89 | 2.35 | 0.21 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.59 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.88Mg1.01Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -76734.66 (J) H = -61231.28 (J) S = 12.18 (J/K) V = 1.60 (cc) Cp = 6.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.94 | 96.64 | 87.73 | 4.39 | -4.15 | 7.04 | 0.30 |

feldspar mass = 20.43 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -341579.62 (J) H = -280568.51 (J) S = 47.92 (J/K) V = 7.86 (cc) Cp = 25.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.86 | 26.15 | 2.98 |

quartz mass = 7.62 (gm) density = 2.55 (gm/cc)

SiO2
G = -127405.25 (J)  H = -105902.45 (J)  S = 16.89 (J/K)  V = 2.99 (cc)  Cp = 9.04 (J/K)

Total solids  mass = 33.64 (gm)  density = 2.70 (gm/cc)
G = -545719.52 (J)  H = -447702.24 (J)  S = 76.99 (J/K)  V = 12.45 (cc)  Cp = 40.63 (J/K)

Viscosity of the System: 7.07 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.51 (gm/cc)
G = -1629282.39 (J)  H = -1314542.34 (J)  S = 247.21 (J/K)  V = 39.78 (cc)  Cp = 129.18 (J/K)

Oxygen  delta moles = -0.000556449  delta grams = -0.0178057
G = 160.59 (J)  H = -18.01 (J)  S = -0.14 (J/K)  V = -58.90 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 990.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.25  COH = 1.96  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 61.77 (gm)  density = 2.42 (gm/cc)  viscosity = 6.21 (log 10 poise)  (analysis in wt %)
G = -1007641.20 (J)  H = -807646.22 (J)  S = 158.33 (J/K)  V = 25.48 (cc)  Cp = 82.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.63 | 0.69 | 13.25 | 0.69 | 0.00 | 2.76 | 0.13 | 0.48 | 0.00 | 0.00 | 2.20 | 3.83 | 2.49 | 0.23 | 1.62 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.10 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.98Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -82916.33 (J)  H = -66251.44 (J)  S = 13.19 (J/K)  V = 1.74 (cc)  Cp = 7.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.24 | 96.75 | 90.73 | 4.48 | -4.22 | 7.21 | 0.29 |

feldspar  mass = 23.01 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -384138.65 (J)  H = -316231.45 (J)  S = 53.76 (J/K)  V = 8.85 (cc)  Cp = 28.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.00 | 25.82 | 3.18 |

quartz  mass = 9.10 (gm)  density = 2.55 (gm/cc)
SiO2
G = -152074.79 (J)  H = -126683.86 (J)  S = 20.10 (J/K)  V = 3.57 (cc)  Cp = 10.80 (J/K)

Total solids  mass = 38.21 (gm)  density = 2.70 (gm/cc)
G = -619129.78 (J)  H = -509166.76 (J)  S = 87.05 (J/K)  V = 14.16 (cc)  Cp = 46.08 (J/K)

Viscosity of the System: 7.30 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.52 (gm/cc)
G = -1626770.98 (J)  H = -1316812.98 (J)  S = 245.38 (J/K)  V = 39.64 (cc)  Cp = 128.51 (J/K)

Oxygen  delta moles = -0.000646494  delta grams = -0.020687

G = 184.95 (J)  H = -20.69 (J)  S = -0.16 (J/K)  V = -67.90 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 980.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.24  COH = 1.93  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 57.67 (gm)  density = 2.42 (gm/cc)  viscosity = 6.21 (log 10 poise)  (analysis in wt %)
G = -939825.44 (J)  H = -754749.87 (J)  S = 147.69 (J/K)  V = 23.83 (cc)  Cp = 76.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.55 | 0.74 | 13.23 | 0.68 | 0.00 | 2.69 | 0.14 | 0.44 | 0.00 | 0.00 | 2.16 | 3.77 | 2.63 | 0.24 | 1.74 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.56 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.96Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -88477.19 (J)  H = -70797.61 (J)  S = 14.11 (J/K)  V = 1.87 (cc)  Cp = 7.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.26 | 96.85 | 93.48 | 4.56 | -4.28 | 7.36 | 0.29 |

feldspar  mass = 25.32 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -422043.26 (J)  H = -348212.15 (J)  S = 58.92 (J/K)  V = 9.74 (cc)  Cp = 31.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.10 | 25.52 | 3.37 |

quartz  mass = 10.43 (gm)  density = 2.55 (gm/cc)
SiO2
G = -173933.35 (J)  H = -145207.82 (J)  S = 22.92 (J/K)  V = 4.09 (cc)  Cp = 12.36 (J/K)

Total solids  mass = 42.30 (gm)  density = 2.70 (gm/cc)
G = -684453.81 (J)  H = -564217.59 (J)  S = 95.95 (J/K)  V = 15.69 (cc)  Cp = 50.95 (J/K)

Viscosity of the System: 7.59 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.53 (gm/cc)
G = -1624279.25 (J)  H = -1318967.45 (J)  S = 243.64 (J/K)  V = 39.52 (cc)  Cp = 127.91 (J/K)

Oxygen  delta moles = -0.000733325  delta grams = -0.0234655
G = 207.94 (J)  H = -23.21 (J)  S = -0.18 (J/K)  V = -76.41 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 970.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.24  COH = 1.91  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 53.99 (gm)  density = 2.42 (gm/cc)  viscosity = 6.22 (log 10 poise)  (analysis in wt %)
G = -878960.38 (J)  H = -707250.68 (J)  S = 138.12 (J/K)  V = 22.34 (cc)  Cp = 72.05 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.46 0.79 13.21 0.66 0.00 2.60 0.15 0.40 0.00 0.00 2.13 3.70 2.77 0.26 1.86 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.98 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.93Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -93474.03 (J) H = -74914.68 (J) S = 14.93 (J/K) V = 1.98 (cc) Cp = 8.02 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-100.99 96.95 95.97 4.64 -4.34 7.49 0.28

feldspar mass = 27.39 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -455951.53 (J) H = -377029.34 (J) S = 63.49 (J/K) V = 10.54 (cc) Cp = 33.54 (J/K)
albite anorthite sanidine
71.19 25.25 3.57

quartz mass = 11.61 (gm) density = 2.55 (gm/cc)
SiO2
G = -193420.71 (J) H = -161826.96 (J) S = 25.41 (J/K) V = 4.55 (cc) Cp = 13.75 (J/K)

Total solids mass = 45.99 (gm) density = 2.69 (gm/cc)
G = -742846.27 (J) H = -613770.98 (J) S = 103.83 (J/K) V = 17.07 (cc) Cp = 55.31 (J/K)

Viscosity of the System: 7.96 (log 10 poise)

System mass = 99.97 (gm) density = 2.54 (gm/cc)
G = -1621806.65 (J) H = -1321021.65 (J) S = 241.95 (J/K) V = 39.41 (cc) Cp = 127.35 (J/K)

Oxygen delta moles = -0.000816588 delta grams = -0.0261298
G = 229.50 (J) H = -25.55 (J) S = -0.21 (J/K) V = -84.40 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 960.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.23 COH = 1.89 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 50.66 (gm) density = 2.41 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -824097.39 (J) H = -664409.72 (J) S = 129.50 (J/K) V = 21.00 (cc) Cp = 67.61 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.38 0.84 13.20 0.65 0.00 2.50 0.16 0.37 0.00 0.00 2.10 3.63 2.90 0.28 1.98 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.37 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.91Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -97955.04 (J) H = -78640.30 (J) S = 15.66 (J/K) V = 2.08 (cc) Cp = 8.43 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.44 97.04 98.21 4.71 -4.39 7.59 0.27

feldspar mass = 29.27 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -486406.00 (J) H = -403110.67 (J) S = 67.55 (J/K) V = 11.26 (cc) Cp = 35.80 (J/K)
albite anorthite sanidine
71.25 24.99 3.76

quartz mass = 12.67 (gm) density = 2.55 (gm/cc)
SiO2
G = -210894.24 (J) H = -176827.99 (J) S = 27.63 (J/K) V = 4.97 (cc) Cp = 15.00 (J/K)

Total solids mass = 49.31 (gm) density = 2.69 (gm/cc)
G = -795255.29 (J) H = -658578.96 (J) S = 110.84 (J/K) V = 18.31 (cc) Cp = 59.23 (J/K)

Viscosity of the System: 8.54 (log 10 poise)

System mass = 99.97 (gm) density = 2.54 (gm/cc)
G = -1619352.67 (J) H = -1322988.68 (J) S = 240.33 (J/K) V = 39.31 (cc) Cp = 126.84 (J/K)

Oxygen delta moles = -0.000896021 delta grams = -0.0286716
G = 249.58 (J) H = -27.72 (J) S = -0.22 (J/K) V = -91.87 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 950.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.22 COH = 1.87 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 47.47 (gm) density = 2.41 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -771744.35 (J) H = -623438.75 (J) S = 121.25 (J/K) V = 19.72 (cc) Cp = 63.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.35 | 0.84 | 13.20 | 0.62 | 0.00 | 2.38 | 0.17 | 0.34 | 0.00 | 0.00 | 2.07 | 3.57 | 3.05 | 0.30 | 2.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.69 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.89Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -101582.80 (J) H = -81709.90 (J) S = 16.25 (J/K) V = 2.17 (cc) Cp = 8.77 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-105.37 97.12 100.01 4.76 -4.43 7.65 0.27

feldspar mass = 31.04 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -515066.71 (J) H = -427816.07 (J) S = 71.33 (J/K) V = 11.94 (cc) Cp = 37.93 (J/K)
albite anorthite sanidine
71.25 24.78 3.97

quartz mass = 13.71 (gm) density = 2.55 (gm/cc)
SiO2
G = -227882.16 (J) H = -191484.07 (J) S = 29.76 (J/K) V = 5.38 (cc) Cp = 16.21 (J/K)

rhm-oxide mass = 0.06 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.11Fe'"0.23Al0.12Ti0.83O3
G = -648.04 (J) H = -492.86 (J) S = 0.13 (J/K) V = 0.01 (cc) Cp = 0.06 (J/K)

geikielite hematite ilmenite pyrophanite corundum
10.57 11.32 70.28 1.97 5.87

Total solids mass = 52.50 (gm) density = 2.69 (gm/cc)
G = -845179.71 (J) H = -701502.90 (J) S = 117.46 (J/K) V = 19.49 (cc) Cp = 62.97 (J/K)

Viscosity of the System: 10.70 (log 10 poise)

System mass = 99.97 (gm) density = 2.55 (gm/cc)
G = -1616924.06 (J) H = -1324941.64 (J) S = 238.71 (J/K) V = 39.21 (cc) Cp = 126.34 (J/K)

Oxygen delta moles = -0.000958226 delta grams = -0.0306621
G = 264.50 (J) H = -29.30 (J) S = -0.24 (J/K) V = -97.45 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 940.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.21 COH = 1.84 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 44.44 (gm) density = 2.40 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -722373.06 (J) H = -584719.65 (J) S = 113.47 (J/K) V = 18.51 (cc) Cp = 59.34 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.34 0.78 13.20 0.59 0.00 2.25 0.18 0.32 0.00 0.00 2.05 3.51 3.20 0.32 2.26 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.94 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.88Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -104455.20 (J) H = -84197.51 (J) S = 16.70 (J/K) V = 2.23 (cc) Cp = 9.04 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-106.86 97.18 101.43 4.78 -4.47 7.68 0.26

feldspar mass = 32.70 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -541792.64 (J) H = -451017.91 (J) S = 74.83 (J/K) V = 12.57 (cc) Cp = 39.91 (J/K)
albite anorthite sanidine
71.20 24.60 4.20

quartz mass = 14.71 (gm) density = 2.55 (gm/cc)
SiO2
G = -244166.91 (J) H = -205609.30 (J) S = 31.78 (J/K) V = 5.77 (cc) Cp = 17.38 (J/K)

rhm-oxide mass = 0.17 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.10Fe'"0.23Al0.11Ti0.83O3
G = -1731.33 (J) H = -1320.49 (J) S = 0.34 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.29 11.29 70.60 2.07 5.75

Total solids mass = 55.53 (gm) density = 2.69 (gm/cc)
G = -892146.08 (J) H = -742145.21 (J) S = 123.65 (J/K) V = 20.61 (cc) Cp = 66.50 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1614519.14 (J) H = -1326864.87 (J) S = 237.11 (J/K) V = 39.12 (cc) Cp = 125.84 (J/K)

Oxygen delta moles = -0.00100648 delta grams = -0.0322062
G = 275.30 (J) H = -30.41 (J) S = -0.25 (J/K) V = -101.52 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 41.71 (gm) density = 2.40 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -677875.16 (J) H = -549788.75 (J) S = 106.46 (J/K) V = 17.42 (cc) Cp = 55.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.33 | 0.73 | 13.21 | 0.57 | 0.00 | 2.11 | 0.19 | 0.30 | 0.00 | 0.00 | 2.03 | 3.44 | 3.35 | 0.34 | 2.41 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.17 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.86Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -106965.81 (J) H = -86409.45 (J) S = 17.09 (J/K) V = 2.29 (cc) Cp = 9.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.17 | 97.25 | 102.70 | 4.80 | -4.51 | 7.69 | 0.26 |

feldspar mass = 34.20 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.24Al1.24Si2.76O8
G = -565818.22 (J) H = -472066.48 (J) S = 77.92 (J/K) V = 13.15 (cc) Cp = 41.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.15 | 24.43 | 4.43 |

quartz mass = 15.62 (gm) density = 2.55 (gm/cc)
SiO2
G = -258820.66 (J) H = -218416.81 (J) S = 33.58 (J/K) V = 6.12 (cc) Cp = 18.43 (J/K)

rhm-oxide mass = 0.27 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.10Fe"'0.22Al0.11Ti0.83O3
G = -2650.93 (J) H = -2027.81 (J) S = 0.52 (J/K) V = 0.06 (cc) Cp = 0.26 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.05 | 11.24 | 70.92 | 2.17 | 5.63 |

Total solids mass = 58.25 (gm) density = 2.69 (gm/cc)
G = -934255.62 (J) H = -778920.56 (J) S = 129.11 (J/K) V = 21.62 (cc) Cp = 69.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1612130.78 (J) H = -1328709.31 (J) S = 235.57 (J/K) V = 39.04 (cc) Cp = 125.39 (J/K)

Oxygen delta moles = -0.00105325 delta grams = -0.0337027

G = 285.45 (J)  H = -31.45 (J)  S = -0.26 (J/K)  V = -105.36 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 920.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = 0.20  COH = 1.79  IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 39.24 (gm)  density = 2.39 (gm/cc)  viscosity = 6.20 (log 10 poise)  (analysis in wt %)
G = -637545.58 (J)  H = -518096.02 (J)  S = 100.11 (J/K)  V = 16.42 (cc)  Cp = 52.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.29 | 0.69 | 13.23 | 0.54 | 0.00 | 1.98 | 0.19 | 0.28 | 0.00 | 0.00 | 2.01 | 3.38 | 3.50 | 0.36 | 2.56 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.37 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.85Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -109156.62 (J)  H = -88377.51 (J)  S = 17.42 (J/K)  V = 2.35 (cc)  Cp = 9.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.33 | 97.30 | 103.82 | 4.82 | -4.55 | 7.68 | 0.25 |

feldspar  mass = 35.56 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -587529.90 (J)  H = -491269.85 (J)  S = 80.68 (J/K)  V = 13.67 (cc)  Cp = 43.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.08 | 24.26 | 4.65 |

quartz  mass = 16.44 (gm)  density = 2.55 (gm/cc)
SiO2
G = -272091.01 (J)  H = -230107.10 (J)  S = 35.19 (J/K)  V = 6.44 (cc)  Cp = 19.38 (J/K)

rhm-oxide  mass = 0.35 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.02Fe"0.71Mg0.10Fe'"0.22Al0.11Ti0.83O3
G = -3435.41 (J)  H = -2635.75 (J)  S = 0.67 (J/K)  V = 0.08 (cc)  Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.84 | 11.16 | 71.23 | 2.27 | 5.51 |

Total solids  mass = 60.72 (gm)  density = 2.69 (gm/cc)
G = -972212.95 (J)  H = -812390.22 (J)  S = 133.95 (J/K)  V = 22.54 (cc)  Cp = 72.53 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.57 (gm/cc)
G = -1609758.53 (J)  H = -1330486.24 (J)  S = 234.06 (J/K)  V = 38.96 (cc)  Cp = 124.97 (J/K)

Oxygen  delta moles = -0.00109847  delta grams = -0.0351498
G = 294.97 (J)  H = -32.41 (J)  S = -0.27 (J/K)  V = -108.97 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 910.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = 0.19  COH = 1.77  IW

= 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 36.99 (gm) density = 2.38 (gm/cc) viscosity = 6.19 (log 10 poise) (analysis in wt %)
G = -600802.23 (J) H = -489187.37 (J) S = 94.34 (J/K) V = 15.52 (cc) Cp = 49.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.25 | 0.64 | 13.24 | 0.51 | 0.00 | 1.85 | 0.20 | 0.26 | 0.00 | 0.00 | 1.99 | 3.32 | 3.65 | 0.38 | 2.71 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.55 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.84Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -111065.20 (J) H = -90130.02 (J) S = 17.69 (J/K) V = 2.39 (cc) Cp = 9.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.35 | 97.36 | 104.82 | 4.84 | -4.58 | 7.67 | 0.25 |

feldspar mass = 36.81 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -607247.04 (J) H = -508882.73 (J) S = 83.14 (J/K) V = 14.15 (cc) Cp = 44.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.01 | 24.11 | 4.88 |

quartz mass = 17.19 (gm) density = 2.55 (gm/cc)
SiO2
G = -284180.01 (J) H = -240843.85 (J) S = 36.63 (J/K) V = 6.74 (cc) Cp = 20.25 (J/K)

rhm-oxide mass = 0.42 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.72Mg0.10Fe'"0.22Al0.11Ti0.84O3
G = -4107.51 (J) H = -3160.99 (J) S = 0.80 (J/K) V = 0.09 (cc) Cp = 0.40 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.64 | 11.06 | 71.53 | 2.37 | 5.40 |

Total solids mass = 62.97 (gm) density = 2.69 (gm/cc)
G = -1006599.76 (J) H = -843017.59 (J) S = 138.26 (J/K) V = 23.37 (cc) Cp = 75.12 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1607401.99 (J) H = -1332204.97 (J) S = 232.60 (J/K) V = 38.89 (cc) Cp = 124.58 (J/K)

Oxygen delta moles = -0.00114212 delta grams = -0.0365463
G = 303.83 (J) H = -33.29 (J) S = -0.28 (J/K) V = -112.35 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 900.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.19 COH = 1.74 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 34.93 (gm) density = 2.38 (gm/cc) viscosity = 6.18 (log 10 poise) (analysis in wt %)
G = -567160.07 (J) H = -462684.44 (J) S = 89.06 (J/K) V = 14.69 (cc) Cp = 46.73 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.18 0.60 13.26 0.49 0.00 1.73 0.21 0.24 0.00 0.00 1.97 3.25 3.79 0.40 2.87 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.71 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.84Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -112725.08 (J) H = -91692.27 (J) S = 17.93 (J/K) V = 2.44 (cc) Cp = 9.83 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-111.25 97.41 105.71 4.86 -4.61 7.64 0.24

feldspar mass = 37.96 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -625236.05 (J) H = -525117.70 (J) S = 85.34 (J/K) V = 14.59 (cc) Cp = 46.16 (J/K)
albite anorthite sanidine
70.92 23.96 5.12

quartz mass = 17.88 (gm) density = 2.55 (gm/cc)
SiO2
G = -295254.16 (J) H = -250762.00 (J) S = 37.93 (J/K) V = 7.01 (cc) Cp = 21.05 (J/K)

rhm-oxide mass = 0.48 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.72Mg0.09Fe'"0.22Al0.11Ti0.84O3
G = -4685.48 (J) H = -3616.89 (J) S = 0.91 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.47 10.94 71.84 2.47 5.29

Total solids mass = 65.03 (gm) density = 2.69 (gm/cc)
G = -1037900.78 (J) H = -871188.86 (J) S = 142.11 (J/K) V = 24.14 (cc) Cp = 77.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.57 (gm/cc)
G = -1605060.84 (J) H = -1333873.29 (J) S = 231.16 (J/K) V = 38.83 (cc) Cp = 124.22 (J/K)

Oxygen delta moles = -0.00118416 delta grams = -0.0378916
G = 312.06 (J) H = -34.10 (J) S = -0.30 (J/K) V = -115.50 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 890.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.18 COH = 1.72 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 33.04 (gm) density = 2.37 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -536211.52 (J) H = -438269.16 (J) S = 84.20 (J/K) V = 13.92 (cc) Cp = 44.23 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.10 0.56 13.28 0.46 0.00 1.61 0.22 0.23 0.00 0.00 1.96 3.19 3.93 0.43 3.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.85 (gm) density = 3.58 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.06Mg0.83Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -114166.09 (J) H = -93086.73 (J) S = 18.12 (J/K) V = 2.47 (cc) Cp = 9.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.05 | 97.47 | 106.50 | 4.88 | -4.65 | 7.61 | 0.24 |

feldspar mass = 39.02 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -641721.16 (J) H = -540153.79 (J) S = 87.32 (J/K) V = 14.99 (cc) Cp = 47.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.83 | 23.82 | 5.35 |

quartz mass = 18.52 (gm) density = 2.55 (gm/cc)
SiO2
G = -305451.89 (J) H = -259973.82 (J) S = 39.10 (J/K) V = 7.26 (cc) Cp = 21.78 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.22Al0.10Ti0.84O3
G = -5184.13 (J) H = -4014.26 (J) S = 1.01 (J/K) V = 0.11 (cc) Cp = 0.50 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.31 | 10.80 | 72.14 | 2.56 | 5.19 |

Total solids mass = 66.92 (gm) density = 2.69 (gm/cc)
G = -1066523.28 (J) H = -897228.60 (J) S = 145.55 (J/K) V = 24.84 (cc) Cp = 79.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1602734.80 (J) H = -1335497.76 (J) S = 229.75 (J/K) V = 38.77 (cc) Cp = 123.88 (J/K)

Oxygen delta moles = -0.00122459 delta grams = -0.0391853
G = 319.67 (J) H = -34.83 (J) S = -0.30 (J/K) V = -118.43 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 880.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.17 COH = 1.69 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 31.29 (gm) density = 2.37 (gm/cc) viscosity = 6.14 (log 10 poise) (analysis in wt %)
G = -507611.36 (J) H = -415672.01 (J) S = 79.73 (J/K) V = 13.21 (cc) Cp = 41.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.99 | 0.53 | 13.30 | 0.43 | 0.00 | 1.50 | 0.23 | 0.21 | 0.00 | 0.00 | 1.95 | 3.12 | 4.06 | 0.45 | 3.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.98 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.07Mg0.82Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -115414.69 (J) H = -94333.33 (J) S = 18.28 (J/K) V = 2.50 (cc) Cp = 10.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.75 | 97.52 | 107.20 | 4.90 | -4.68 | 7.57 | 0.23 |

feldspar mass = 40.00 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -656892.70 (J) H = -554143.09 (J) S = 89.10 (J/K) V = 15.37 (cc) Cp = 48.55 (J/K)
albite anorthite sanidine
70.73 23.69 5.58

quartz mass = 19.12 (gm) density = 2.55 (gm/cc)
SiO2
G = -314889.33 (J) H = -268573.55 (J) S = 40.16 (J/K) V = 7.50 (cc) Cp = 22.46 (J/K)

rhm-oxide mass = 0.57 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.21Al0.10Ti0.84O3
G = -5615.52 (J) H = -4361.93 (J) S = 1.09 (J/K) V = 0.12 (cc) Cp = 0.54 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.16 10.65 72.45 2.66 5.09

Total solids mass = 68.67 (gm) density = 2.69 (gm/cc)
G = -1092812.25 (J) H = -921411.90 (J) S = 148.64 (J/K) V = 25.49 (cc) Cp = 81.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1600423.61 (J) H = -1337083.92 (J) S = 228.37 (J/K) V = 38.71 (cc) Cp = 123.56 (J/K)

Oxygen delta moles = -0.00126342 delta grams = -0.0404278
G = 326.66 (J) H = -35.48 (J) S = -0.31 (J/K) V = -121.13 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 870.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.16 COH = 1.66 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 29.66 (gm) density = 2.36 (gm/cc) viscosity = 6.11 (log 10 poise) (analysis in wt %)
G = -481064.86 (J) H = -394662.69 (J) S = 75.58 (J/K) V = 12.56 (cc) Cp = 39.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.87 | 0.49 | 13.33 | 0.41 | 0.00 | 1.40 | 0.24 | 0.20 | 0.00 | 0.00 | 1.94 | 3.06 | 4.20 | 0.47 | 3.38 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.09 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.08Mg0.82Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -116494.27 (J) H = -95449.71 (J) S = 18.41 (J/K) V = 2.53 (cc) Cp = 10.20 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-113.37 97.57 107.84 4.92 -4.71 7.53 0.23

feldspar mass = 40.91 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -670913.59 (J) H = -567215.93 (J) S = 90.71 (J/K) V = 15.72 (cc) Cp = 49.62 (J/K)
albite anorthite sanidine
70.62 23.56 5.82

quartz mass = 19.68 (gm) density = 2.55 (gm/cc)

SiO2
G = -323664.79 (J)  H = -276641.04 (J)  S = 41.14 (J/K)  V = 7.71 (cc)  Cp = 23.10 (J/K)

rhm-oxide  mass = 0.61 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.21Al0.10Ti0.85O3
G = -5989.56 (J)  H = -4667.13 (J)  S = 1.16 (J/K)  V = 0.13 (cc)  Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.02 | 10.49 | 72.75 | 2.75 | 4.99 |

Total solids  mass = 70.29 (gm)  density = 2.69 (gm/cc)
G = -1117062.21 (J)  H = -943973.81 (J)  S = 151.41 (J/K)  V = 26.10 (cc)  Cp = 83.49 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.59 (gm/cc)
G = -1598127.07 (J)  H = -1338636.51 (J)  S = 227.00 (J/K)  V = 38.65 (cc)  Cp = 123.26 (J/K)

Oxygen  delta moles = -0.00130067  delta grams = -0.0416198
G = 333.06 (J)  H = -36.07 (J)  S = -0.32 (J/K)  V = -123.62 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 860.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -12.64  delta HM = -5.08  NNO = 0.00  QFM = 0.15  COH = 1.64  IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid  mass = 28.15 (gm)  density = 2.36 (gm/cc)  viscosity = 6.09 (log 10 poise)  (analysis in wt %)
G = -456318.36 (J)  H = -375042.75 (J)  S = 71.73 (J/K)  V = 11.94 (cc)  Cp = 37.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.73 | 0.46 | 13.35 | 0.39 | 0.00 | 1.30 | 0.25 | 0.19 | 0.00 | 0.00 | 1.94 | 3.00 | 4.33 | 0.50 | 3.56 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.18 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.08Mg0.81Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -117425.47 (J)  H = -96451.44 (J)  S = 18.51 (J/K)  V = 2.56 (cc)  Cp = 10.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.93 | 97.62 | 108.40 | 4.94 | -4.74 | 7.48 | 0.22 |

feldspar  mass = 41.77 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -683924.48 (J)  H = -579484.98 (J)  S = 92.17 (J/K)  V = 16.04 (cc)  Cp = 50.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.50 | 23.44 | 6.07 |

quartz  mass = 20.20 (gm)  density = 2.55 (gm/cc)
SiO2
G = -331862.22 (J)  H = -284244.55 (J)  S = 42.02 (J/K)  V = 7.92 (cc)  Cp = 23.69 (J/K)

rhm-oxide  mass = 0.65 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.21Al0.10Ti0.85O3
G = -6314.47 (J)  H = -4935.87 (J)  S = 1.22 (J/K)  V = 0.14 (cc)  Cp = 0.61 (J/K)

geikielite hematite ilmenite pyrophanite corundum
8.88 10.33 73.05 2.85 4.89

Total solids mass = 71.81 (gm) density = 2.69 (gm/cc)
G = -1139526.63 (J) H = -965116.84 (J) S = 153.92 (J/K) V = 26.66 (cc) Cp = 85.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1595845.00 (J) H = -1340159.59 (J) S = 225.64 (J/K) V = 38.60 (cc) Cp = 122.98 (J/K)

Oxygen delta moles = -0.00133637 delta grams = -0.0427622
G = 338.89 (J) H = -36.58 (J) S = -0.33 (J/K) V = -125.90 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 850.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.61 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 26.74 (gm) density = 2.35 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -433151.70 (J) H = -356639.65 (J) S = 68.12 (J/K) V = 11.36 (cc) Cp = 35.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.57 | 0.43 | 13.38 | 0.37 | 0.00 | 1.20 | 0.26 | 0.18 | 0.00 | 0.00 | 1.94 | 2.94 | 4.46 | 0.53 | 3.75 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.27 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.81Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -118226.46 (J) H = -97352.26 (J) S = 18.59 (J/K) V = 2.58 (cc) Cp = 10.38 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-114.42 97.67 108.91 4.96 -4.77 7.43 0.22

feldspar mass = 42.57 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -696047.96 (J) H = -591048.59 (J) S = 93.49 (J/K) V = 16.35 (cc) Cp = 51.55 (J/K)
albite anorthite sanidine
70.37 23.32 6.31

quartz mass = 20.70 (gm) density = 2.55 (gm/cc)
SiO2
G = -339554.05 (J) H = -291443.07 (J) S = 42.84 (J/K) V = 8.11 (cc) Cp = 24.24 (J/K)

rhm-oxide mass = 0.68 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.20Al0.10Ti0.85O3
G = -6597.07 (J) H = -5173.12 (J) S = 1.27 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.76 10.15 73.36 2.93 4.80

Total solids mass = 73.22 (gm) density = 2.69 (gm/cc)
G = -1160425.53 (J) H = -985017.03 (J) S = 156.18 (J/K) V = 27.19 (cc) Cp = 86.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1593577.23 (J) H = -1341656.68 (J) S = 224.30 (J/K) V = 38.55 (cc) Cp = 122.71 (J/K)

Oxygen delta moles = -0.00137056 delta grams = -0.0438564
G = 344.17 (J) H = -37.04 (J) S = -0.34 (J/K) V = -127.99 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 840.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.14 COH = 1.58 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 25.40 (gm) density = 2.35 (gm/cc) viscosity = 6.01 (log 10 poise) (analysis in wt %)
G = -411371.95 (J) H = -339301.85 (J) S = 64.74 (J/K) V = 10.82 (cc) Cp = 34.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.38 | 0.40 | 13.42 | 0.35 | 0.00 | 1.12 | 0.28 | 0.17 | 0.00 | 0.00 | 1.94 | 2.88 | 4.58 | 0.55 | 3.95 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.35 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.81Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -118913.24 (J) H = -98164.27 (J) S = 18.64 (J/K) V = 2.60 (cc) Cp = 10.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.87 | 97.72 | 109.36 | 4.99 | -4.80 | 7.38 | 0.21 |

feldspar mass = 43.33 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -707391.94 (J) H = -601993.57 (J) S = 94.68 (J/K) V = 16.64 (cc) Cp = 52.44 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.23 | 23.21 | 6.57 |

quartz mass = 21.17 (gm) density = 2.55 (gm/cc)
SiO2
G = -346803.43 (J) H = -298288.11 (J) S = 43.58 (J/K) V = 8.30 (cc) Cp = 24.76 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.09Fe'"0.20Al0.09Ti0.85O3
G = -6843.09 (J) H = -5383.06 (J) S = 1.31 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.63 | 9.97 | 73.66 | 3.02 | 4.71 |

Total solids mass = 74.55 (gm) density = 2.69 (gm/cc)
G = -1179951.69 (J) H = -1003829.01 (J) S = 158.22 (J/K) V = 27.69 (cc) Cp = 88.31 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1591323.64 (J) H = -1343130.87 (J) S = 222.96 (J/K) V = 38.50 (cc) Cp = 122.46 (J/K)

Oxygen delta moles = -0.00140329 delta grams = -0.0449038

G = 348.91 (J)  H = -37.42 (J)  S = -0.35 (J/K)  V = -129.88 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 830.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -13.24  delta HM = -5.10  NNO = 0.00  QFM = 0.13  COH = 1.55  IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid  mass = 24.15 (gm)  density = 2.34 (gm/cc)  viscosity = 5.97 (log 10 poise)  (analysis in wt %)
G = -390808.23 (J)  H = -322894.73 (J)  S = 61.56 (J/K)  V = 10.30 (cc)  Cp = 32.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.18 | 0.37 | 13.45 | 0.33 | 0.00 | 1.04 | 0.29 | 0.16 | 0.00 | 0.00 | 1.94 | 2.82 | 4.70 | 0.58 | 4.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.42 (gm)  density = 3.60 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.80Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -119499.90 (J)  H = -98898.16 (J)  S = 18.68 (J/K)  V = 2.61 (cc)  Cp = 10.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.27 | 97.77 | 109.77 | 5.01 | -4.84 | 7.34 | 0.21 |

feldspar  mass = 44.05 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -718052.53 (J)  H = -612397.45 (J)  S = 95.78 (J/K)  V = 16.91 (cc)  Cp = 53.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.08 | 23.09 | 6.83 |

quartz  mass = 21.61 (gm)  density = 2.55 (gm/cc)
SiO2
G = -353666.11 (J)  H = -304825.27 (J)  S = 44.27 (J/K)  V = 8.47 (cc)  Cp = 25.26 (J/K)

rhm-oxide  mass = 0.73 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.74Mg0.09Fe'"0.20Al0.09Ti0.86O3
G = -7057.35 (J)  H = -5569.24 (J)  S = 1.35 (J/K)  V = 0.16 (cc)  Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.51 | 9.79 | 73.97 | 3.10 | 4.63 |

Total solids  mass = 75.81 (gm)  density = 2.69 (gm/cc)
G = -1198275.90 (J)  H = -1021690.12 (J)  S = 160.07 (J/K)  V = 28.16 (cc)  Cp = 89.73 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.60 (gm/cc)
G = -1589084.13 (J)  H = -1344584.85 (J)  S = 221.64 (J/K)  V = 38.46 (cc)  Cp = 122.22 (J/K)

Oxygen  delta moles = -0.00143461  delta grams = -0.0459059
G = 353.15 (J)  H = -37.75 (J)  S = -0.35 (J/K)  V = -131.58 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 820.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = 0.12  COH = 1.52  IW

= 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 22.96 (gm) density = 2.34 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -371307.22 (J) H = -307296.98 (J) S = 58.56 (J/K) V = 9.81 (cc) Cp = 30.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.95 | 0.35 | 13.49 | 0.31 | 0.00 | 0.96 | 0.30 | 0.15 | 0.00 | 0.00 | 1.94 | 2.76 | 4.82 | 0.61 | 4.37 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.48 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.80Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -119998.84 (J) H = -99563.36 (J) S = 18.69 (J/K) V = 2.63 (cc) Cp = 10.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.63 | 97.83 | 110.14 | 5.04 | -4.87 | 7.29 | 0.20 |

feldspar mass = 44.73 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -728116.55 (J) H = -622330.55 (J) S = 96.77 (J/K) V = 17.17 (cc) Cp = 54.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.92 | 22.98 | 7.10 |

quartz mass = 22.04 (gm) density = 2.55 (gm/cc)
SiO2
G = -360192.04 (J) H = -311095.52 (J) S = 44.91 (J/K) V = 8.64 (cc) Cp = 25.73 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.08Fe'"0.19Al0.09Ti0.86O3
G = -7243.95 (J) H = -5734.63 (J) S = 1.38 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.40 | 9.61 | 74.27 | 3.17 | 4.55 |

Total solids mass = 77.00 (gm) density = 2.69 (gm/cc)
G = -1215551.38 (J) H = -1038724.07 (J) S = 161.76 (J/K) V = 28.60 (cc) Cp = 91.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1586858.60 (J) H = -1346021.05 (J) S = 220.32 (J/K) V = 38.42 (cc) Cp = 122.01 (J/K)

Oxygen delta moles = -0.00146457 delta grams = -0.0468645
G = 356.91 (J) H = -38.03 (J) S = -0.36 (J/K) V = -133.11 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 21.82 (gm) density = 2.33 (gm/cc) viscosity = 5.86 (log 10 poise) (analysis in wt %)
G = -352729.17 (J) H = -292397.51 (J) S = 55.70 (J/K) V = 9.35 (cc) Cp = 29.43 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.69 0.32 13.53 0.29 0.00 0.89 0.31 0.14 0.00 0.00 1.95 2.70 4.93 0.64 4.60 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.53 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.80Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -120421.01 (J) H = -100168.22 (J) S = 18.70 (J/K) V = 2.64 (cc) Cp = 10.61 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-115.96 97.88 110.48 5.07 -4.91 7.24 0.20

feldspar mass = 45.38 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -737663.69 (J) H = -631857.73 (J) S = 97.68 (J/K) V = 17.42 (cc) Cp = 54.88 (J/K)
albite anorthite sanidine
69.75 22.88 7.38

quartz mass = 22.45 (gm) density = 2.55 (gm/cc)
SiO2
G = -366426.74 (J) H = -317136.41 (J) S = 45.51 (J/K) V = 8.80 (cc) Cp = 26.18 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.19Al0.09Ti0.86O3
G = -7406.38 (J) H = -5881.80 (J) S = 1.41 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.28 9.42 74.58 3.24 4.47

Total solids mass = 78.13 (gm) density = 2.69 (gm/cc)
G = -1231917.81 (J) H = -1055044.16 (J) S = 163.30 (J/K) V = 29.03 (cc) Cp = 92.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1584646.98 (J) H = -1347441.67 (J) S = 219.00 (J/K) V = 38.37 (cc) Cp = 121.81 (J/K)

Oxygen delta moles = -0.00149322 delta grams = -0.0477814
G = 360.21 (J) H = -38.24 (J) S = -0.37 (J/K) V = -134.47 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 20.73 (gm) density = 2.33 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -334944.19 (J) H = -278092.36 (J) S = 52.98 (J/K) V = 8.90 (cc) Cp = 28.00 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.40 0.30 13.58 0.27 0.00 0.83 0.33 0.14 0.00 0.00 1.96 2.65 5.03 0.68 4.84 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.58 (gm) density = 3.61 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.11Mg0.80Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -120776.11 (J) H = -100720.15 (J) S = 18.69 (J/K) V = 2.65 (cc) Cp = 10.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.26 | 97.93 | 110.78 | 5.10 | -4.95 | 7.20 | 0.19 |

feldspar mass = 46.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.23Al1.23Si2.77O8
G = -746768.61 (J) H = -641040.18 (J) S = 98.52 (J/K) V = 17.66 (cc) Cp = 55.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.56 | 22.77 | 7.67 |

quartz mass = 22.84 (gm) density = 2.55 (gm/cc)
SiO2
G = -372412.69 (J) H = -322983.11 (J) S = 46.06 (J/K) V = 8.95 (cc) Cp = 26.61 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.18Al0.09Ti0.86O3
G = -7547.62 (J) H = -6012.95 (J) S = 1.43 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.17 | 9.23 | 74.90 | 3.31 | 4.39 |

Total solids mass = 79.22 (gm) density = 2.69 (gm/cc)
G = -1247505.03 (J) H = -1070756.39 (J) S = 164.70 (J/K) V = 29.44 (cc) Cp = 93.63 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1582449.22 (J) H = -1348848.75 (J) S = 217.68 (J/K) V = 38.33 (cc) Cp = 121.63 (J/K)

Oxygen delta moles = -0.00152063 delta grams = -0.0486583
G = 363.08 (J) H = -38.41 (J) S = -0.37 (J/K) V = -135.68 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 790.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = 0.09 COH = 1.43 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 19.68 (gm) density = 2.33 (gm/cc) viscosity = 5.73 (log 10 poise) (analysis in wt %)
G = -317828.55 (J) H = -264281.71 (J) S = 50.37 (J/K) V = 8.46 (cc) Cp = 26.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.08 | 0.27 | 13.63 | 0.26 | 0.00 | 0.77 | 0.34 | 0.13 | 0.00 | 0.00 | 1.98 | 2.60 | 5.13 | 0.71 | 5.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.62 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.11Mg0.80Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -121072.76 (J) H = -101225.80 (J) S = 18.67 (J/K) V = 2.66 (cc) Cp = 10.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.53 | 97.99 | 111.05 | 5.13 | -4.99 | 7.17 | 0.19 |

feldspar mass = 46.62 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -755503.08 (J) H = -649937.14 (J) S = 99.30 (J/K) V = 17.89 (cc) Cp = 56.41 (J/K)
albite anorthite sanidine
69.36 22.67 7.97

quartz mass = 23.23 (gm) density = 2.55 (gm/cc)
SiO2
G = -378190.64 (J) H = -328669.62 (J) S = 46.58 (J/K) V = 9.10 (cc) Cp = 27.02 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.18Al0.09Ti0.87O3
G = -7670.28 (J) H = -6129.98 (J) S = 1.45 (J/K) V = 0.17 (cc) Cp = 0.74 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.06 9.04 75.22 3.37 4.32

Total solids mass = 80.27 (gm) density = 2.69 (gm/cc)
G = -1262436.76 (J) H = -1085962.53 (J) S = 165.99 (J/K) V = 29.83 (cc) Cp = 94.86 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1580265.30 (J) H = -1350244.24 (J) S = 216.36 (J/K) V = 38.29 (cc) Cp = 121.48 (J/K)

Oxygen delta moles = -0.00154684 delta grams = -0.0494971
G = 365.54 (J) H = -38.53 (J) S = -0.38 (J/K) V = -136.73 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 780.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = 0.08 COH = 1.40 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 18.67 (gm) density = 2.32 (gm/cc) viscosity = 5.65 (log 10 poise) (analysis in wt %)
G = -301260.55 (J) H = -250866.42 (J) S = 47.85 (J/K) V = 8.04 (cc) Cp = 25.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.73 | 0.25 | 13.68 | 0.25 | 0.00 | 0.71 | 0.36 | 0.12 | 0.00 | 0.00 | 2.00 | 2.55 | 5.23 | 0.75 | 5.38 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.66 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.11Mg0.79Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -121318.71 (J) H = -101691.13 (J) S = 18.64 (J/K) V = 2.67 (cc) Cp = 10.71 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-116.79 98.05 111.29 5.18 -5.04 7.13 0.18

feldspar mass = 47.21 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -763938.26 (J) H = -658607.94 (J) S = 100.01 (J/K) V = 18.11 (cc) Cp = 57.18 (J/K)
albite anorthite sanidine
69.15 22.56 8.29

quartz mass = 23.60 (gm) density = 2.55 (gm/cc)

SiO2
G = -383801.08 (J)  H = -334230.02 (J)  S = 47.07 (J/K)  V = 9.25 (cc)  Cp = 27.43 (J/K)

rhm-oxide  mass = 0.81 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.76Mg0.08Fe'''0.18Al0.08Ti0.87O3
G = -7776.60 (J)  H = -6234.54 (J)  S = 1.46 (J/K)  V = 0.17 (cc)  Cp = 0.75 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.95 | 8.85 | 75.54 | 3.42 | 4.25 |

Total solids  mass = 81.28 (gm)  density = 2.69 (gm/cc)
G = -1276834.65 (J)  H = -1100763.63 (J)  S = 167.19 (J/K)  V = 30.21 (cc)  Cp = 96.07 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.61 (gm/cc)
G = -1578095.20 (J)  H = -1351630.05 (J)  S = 215.04 (J/K)  V = 38.25 (cc)  Cp = 121.37 (J/K)

Oxygen  delta moles = -0.00157192  delta grams = -0.0502995
G = 367.60 (J)  H = -38.60 (J)  S = -0.39 (J/K)  V = -137.64 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 770.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.54  delta HM = -5.16  NNO = 0.00  QFM = 0.07  COH = 1.37  IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid  mass = 17.40 (gm)  density = 2.31 (gm/cc)  viscosity = 5.50 (log 10 poise)  (analysis in wt %)
G = -280795.01 (J)  H = -234045.98 (J)  S = 44.82 (J/K)  V = 7.52 (cc)  Cp = 23.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.26 | 0.23 | 13.73 | 0.24 | 0.00 | 0.67 | 0.38 | 0.12 | 0.00 | 0.00 | 2.04 | 2.57 | 5.19 | 0.81 | 5.77 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.69 (gm)  density = 3.62 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.11Mg0.79Fe'''0.02Ti0.00Al0.13Si1.93O6
G = -121507.44 (J)  H = -102112.01 (J)  S = 18.59 (J/K)  V = 2.68 (cc)  Cp = 10.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -117.06 | 98.12 | 111.47 | 5.26 | -5.14 | 7.15 | 0.18 |

feldspar  mass = 47.30 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -764475.56 (J)  H = -660518.41 (J)  S = 99.66 (J/K)  V = 18.14 (cc)  Cp = 57.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.12 | 22.69 | 8.19 |

feldspar  mass = 0.68 (gm)  density = 2.53 (gm/cc)  (analysis in mole %)
K0.69Na0.30Ca0.02Al1.02Si2.98O8
G = -10678.27 (J)  H = -9204.70 (J)  S = 1.41 (J/K)  V = 0.27 (cc)  Cp = 0.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.67 | 1.71 | 68.62 |

quartz  mass = 24.05 (gm)  density = 2.55 (gm/cc)

SiO2
G = -390587.00 (J)  H = -340835.27 (J)  S = 47.69 (J/K)  V = 9.43 (cc)  Cp = 27.91 (J/K)

rhm-oxide  mass = 0.83 (gm)  density = 4.67 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.76Mg0.08Fe'"0.17Al0.08Ti0.87O3
G = -7896.35 (J)  H = -6350.71 (J)  S = 1.48 (J/K)  V = 0.18 (cc)  Cp = 0.76 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.84 | 8.64 | 75.86 | 3.44 | 4.20 |

Total solids  mass = 82.55 (gm)  density = 2.69 (gm/cc)
G = -1295144.63 (J)  H = -1119021.11 (J)  S = 168.84 (J/K)  V = 30.69 (cc)  Cp = 97.61 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.62 (gm/cc)
G = -1575939.64 (J)  H = -1353067.09 (J)  S = 213.65 (J/K)  V = 38.21 (cc)  Cp = 121.26 (J/K)

Oxygen  delta moles = -0.00159484  delta grams = -0.0510329
G = 369.05 (J)  H = -38.61 (J)  S = -0.39 (J/K)  V = -138.32 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 760.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.77  delta HM = -5.17  NNO = 0.00  QFM = 0.07  COH = 1.34  IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid  mass = 15.93 (gm)  density = 2.30 (gm/cc)  viscosity = 5.27 (log 10 poise)  (analysis in wt %)
G = -257190.00 (J)  H = -214442.78 (J)  S = 41.38 (J/K)  V = 6.91 (cc)  Cp = 21.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.68 | 0.20 | 13.71 | 0.23 | 0.00 | 0.65 | 0.42 | 0.11 | 0.00 | 0.00 | 2.12 | 2.68 | 5.02 | 0.88 | 6.30 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 0.22 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.15Fe"0.65Mg0.20)3Al2Si3O12
G = -2920.49 (J)  H = -2494.04 (J)  S = 0.41 (J/K)  V = 0.06 (cc)  Cp = 0.24 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.38 | 14.81 | 19.81 |

orthopyroxene  mass = 9.56 (gm)  density = 3.62 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.11Mg0.80Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -119847.87 (J)  H = -100994.20 (J)  S = 18.25 (J/K)  V = 2.64 (cc)  Cp = 10.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -116.75 | 98.19 | 111.15 | 5.32 | -5.19 | 7.11 | 0.17 |

feldspar  mass = 46.97 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -758223.76 (J)  H = -656568.79 (J)  S = 98.39 (J/K)  V = 18.00 (cc)  Cp = 57.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.31 | 22.89 | 7.79 |

feldspar  mass = 1.84 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)

K0.70Na0.29Ca0.02Al1.02Si2.98O8
G = -28723.57 (J) H = -24814.87 (J) S = 3.78 (J/K) V = 0.73 (cc) Cp = 2.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.84 | 1.59 | 69.56 |

quartz mass = 24.59 (gm) density = 2.55 (gm/cc)
SiO2
G = -398874.92 (J) H = -348777.04 (J) S = 48.49 (J/K) V = 9.64 (cc) Cp = 28.50 (J/K)

rhm-oxide mass = 0.84 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.76Mg0.08Fe'"0.17Al0.08Ti0.87O3
G = -8014.37 (J) H = -6466.71 (J) S = 1.50 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.81 | 8.39 | 76.19 | 3.46 | 4.15 |

Total solids mass = 84.02 (gm) density = 2.69 (gm/cc)
G = -1316604.98 (J) H = -1140115.65 (J) S = 170.83 (J/K) V = 31.25 (cc) Cp = 99.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1573794.97 (J) H = -1354558.43 (J) S = 212.20 (J/K) V = 38.16 (cc) Cp = 121.18 (J/K)

Oxygen delta moles = -0.00162414 delta grams = -0.0519706
G = 371.86 (J) H = -38.75 (J) S = -0.40 (J/K) V = -139.51 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 750.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = 0.06 COH = 1.30 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 14.35 (gm) density = 2.29 (gm/cc) viscosity = 4.94 (log 10 poise) (analysis in wt %)
G = -231888.41 (J) H = -193264.91 (J) S = 37.75 (J/K) V = 6.27 (cc) Cp = 19.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.04 | 0.17 | 13.45 | 0.23 | 0.00 | 0.62 | 0.46 | 0.12 | 0.00 | 0.00 | 2.24 | 2.92 | 4.78 | 0.98 | 6.99 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.25 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.65Mg0.20)3Al2Si3O12
G = -16387.03 (J) H = -14031.02 (J) S = 2.30 (J/K) V = 0.31 (cc) Cp = 1.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.76 | 15.29 | 19.96 |

orthopyroxene mass = 8.88 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.82Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -111686.12 (J) H = -94431.06 (J) S = 16.86 (J/K) V = 2.46 (cc) Cp = 9.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.19 | 98.15 | 109.10 | 5.07 | -4.95 | 6.66 | 0.18 |

feldspar mass = 46.31 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -746704.40 (J) H = -648001.58 (J) S = 96.47 (J/K) V = 17.74 (cc) Cp = 56.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.73 | 22.78 | 7.49 |

feldspar mass = 3.04 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.28Ca0.01Al1.01Si2.99O8
G = -47337.91 (J) H = -40986.63 (J) S = 6.21 (J/K) V = 1.20 (cc) Cp = 3.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.23 | 1.48 | 70.29 |

quartz mass = 25.27 (gm) density = 2.55 (gm/cc)
SiO2
G = -409541.20 (J) H = -358831.09 (J) S = 49.56 (J/K) V = 9.91 (cc) Cp = 29.26 (J/K)

rhm-oxide mass = 0.85 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.08Fe"'0.16Al0.08Ti0.88O3
G = -8106.80 (J) H = -6564.24 (J) S = 1.51 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.04 | 8.01 | 76.43 | 3.51 | 4.01 |

Total solids mass = 85.60 (gm) density = 2.69 (gm/cc)
G = -1339763.46 (J) H = -1162845.62 (J) S = 172.91 (J/K) V = 31.81 (cc) Cp = 101.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1571651.87 (J) H = -1356110.53 (J) S = 210.66 (J/K) V = 38.07 (cc) Cp = 121.11 (J/K)

Oxygen delta moles = -0.00167935 delta grams = -0.0537371
G = 380.39 (J) H = -39.48 (J) S = -0.41 (J/K) V = -142.86 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 740.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = 0.05 COH = 1.27 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 12.33 (gm) density = 2.27 (gm/cc) viscosity = 4.48 (log 10 poise) (analysis in wt %)
G = -199359.66 (J) H = -165881.35 (J) S = 33.04 (J/K) V = 5.43 (cc) Cp = 17.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.11 | 0.14 | 12.90 | 0.24 | 0.00 | 0.63 | 0.53 | 0.11 | 0.00 | 0.00 | 2.46 | 3.36 | 4.42 | 1.14 | 7.94 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.00 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.65Mg0.19)3Al2Si3O12
G = -39213.81 (J) H = -33657.22 (J) S = 5.48 (J/K) V = 0.75 (cc) Cp = 3.17 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.74 | 16.09 | 19.17 |

orthopyroxene mass = 7.26 (gm) density = 3.61 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"1.10Mg0.82Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -91041.24 (J) H = -77158.71 (J) S = 13.70 (J/K) V = 2.01 (cc) Cp = 8.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.34 | 98.10 | 109.69 | 4.76 | -4.66 | 6.27 | 0.18 |

biotite mass = 0.59 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -9090.42 (J) H = -7829.65 (J) S = 1.24 (J/K) V = 0.21 (cc) Cp = 0.73 (J/K)

| annite | phlogopite |
|---|---|
| 9.15 | 90.85 |

feldspar mass = 45.59 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.22Al1.22Si2.78O8
G = -734244.00 (J) H = -638548.41 (J) S = 94.45 (J/K) V = 17.47 (cc) Cp = 56.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.43 | 22.28 | 7.29 |

feldspar mass = 3.85 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -59960.92 (J) H = -52030.10 (J) S = 7.83 (J/K) V = 1.52 (cc) Cp = 4.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.85 | 1.36 | 70.79 |

quartz mass = 26.47 (gm) density = 2.55 (gm/cc)
SiO2
G = -428407.70 (J) H = -376121.29 (J) S = 51.61 (J/K) V = 10.38 (cc) Cp = 30.61 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.08Fe'"0.16Al0.08Ti0.88O3
G = -8212.63 (J) H = -6668.50 (J) S = 1.52 (J/K) V = 0.19 (cc) Cp = 0.79 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.85 | 7.93 | 76.92 | 3.54 | 3.77 |

Total solids mass = 87.62 (gm) density = 2.69 (gm/cc)
G = -1370170.71 (J) H = -1192013.87 (J) S = 175.84 (J/K) V = 32.52 (cc) Cp = 103.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1569530.37 (J) H = -1357895.22 (J) S = 208.89 (J/K) V = 37.95 (cc) Cp = 121.04 (J/K)

Oxygen delta moles = -0.00172365 delta grams = -0.0551548
G = 386.22 (J) H = -39.92 (J) S = -0.42 (J/K) V = -145.19 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 730.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = 0.04 COH = 1.24 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 9.82 (gm) density = 2.24 (gm/cc) viscosity = 3.79 (log 10 poise) (analysis in wt %)
G = -158978.90 (J) H = -131756.20 (J) S = 27.14 (J/K) V = 4.38 (cc) Cp = 13.81 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.53 0.10 11.90 0.29 0.00 0.72 0.67 0.10 0.00 0.00 2.86 4.17 3.85 1.43 9.39 0.00 0.00 0.00 0.00

garnet mass = 5.63 (gm) density = 4.00 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.65Mg0.17)3Al2Si3O12
G = -73279.17 (J) H = -63032.36 (J) S = 10.21 (J/K) V = 1.41 (cc) Cp = 5.93 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 65.49 | 17.32 | 17.19 |

orthopyroxene mass = 4.48 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.78Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -55477.49 (J) H = -47066.06 (J) S = 8.39 (J/K) V = 1.23 (cc) Cp = 4.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -118.39 | 98.04 | 114.15 | 4.36 | -4.27 | 5.93 | 0.18 |

biotite mass = 1.94 (gm) density = 2.81 (gm/cc) (analysis in mole %)
K(Fe"0.12Mg0.88)3AlSi3O10(OH)2
G = -29764.12 (J) H = -25658.56 (J) S = 4.09 (J/K) V = 0.69 (cc) Cp = 2.40 (J/K)

| annite | phlogopite |
|---|---|
| 12.17 | 87.83 |

feldspar mass = 44.78 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.72Ca0.21Al1.21Si2.79O8
G = -720325.78 (J) H = -627743.62 (J) S = 92.29 (J/K) V = 17.17 (cc) Cp = 55.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.59 | 21.17 | 7.24 |

feldspar mass = 4.11 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -63941.00 (J) H = -55604.66 (J) S = 8.31 (J/K) V = 1.62 (cc) Cp = 4.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.83 | 1.25 | 70.92 |

quartz mass = 28.29 (gm) density = 2.55 (gm/cc)
SiO2
G = -457349.40 (J) H = -402340.50 (J) S = 54.84 (J/K) V = 11.09 (cc) Cp = 32.67 (J/K)

rhm-oxide mass = 0.89 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.78Mg0.07Fe'"0.16Al0.07Ti0.88O3
G = -8317.64 (J) H = -6766.48 (J) S = 1.55 (J/K) V = 0.19 (cc) Cp = 0.80 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.10 | 8.24 | 77.71 | 3.54 | 3.40 |

Total solids mass = 90.12 (gm) density = 2.70 (gm/cc)
G = -1408454.61 (J) H = -1228212.24 (J) S = 179.68 (J/K) V = 33.40 (cc) Cp = 107.19 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1567433.50 (J) H = -1359968.44 (J) S = 206.81 (J/K) V = 37.78 (cc) Cp = 121.00 (J/K)

Oxygen delta moles = -0.00175901 delta grams = -0.0562864

G = 389.85 (J)  H = -40.12 (J)  S = -0.43 (J/K)  V = -146.71 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.43 (gm/cc)  viscosity = 4.20 (log 10 poise)  (analysis in wt %)
G = -1705733.35 (J)  H = -1261807.97 (J)  S = 282.19 (J/K)  V = 41.08 (cc)  Cp = 143.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.67 | 0.00 | 3.26 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.20 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.43 (gm/cc)
G = -1705733.35 (J)  H = -1261807.97 (J)  S = 282.19 (J/K)  V = 41.08 (cc)  Cp = 143.11 (J/K)

Oxygen  delta moles = -1.11022e-16  delta grams = -3.55258e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -1702917.35 (J)  H = -1263240.13 (J)  S = 281.28 (J/K)  V = 41.05 (cc)  Cp = 143.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.67 | 0.00 | 3.26 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1702917.35 (J)  H = -1263240.13 (J)  S = 281.28 (J/K)  V = 41.05 (cc)  Cp = 143.10 (J/K)

Oxygen  delta moles = 2.46543e-06  delta grams = 7.8891e-05
G = -0.89 (J)  H = 0.11 (J)  S = 0.00 (J/K)  V = 0.32 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1700110.66 (J)  H = -1264672.34 (J)  S = 280.36 (J/K)  V = 41.02 (cc)  Cp = 143.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.67 | 0.00 | 3.26 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1700110.66 (J)  H = -1264672.34 (J)  S = 280.36 (J/K)  V = 41.02 (cc)  Cp = 143.09 (J/K)

Oxygen  delta moles = 5.21099e-06  delta grams = 0.000166745
G = -1.88 (J)  H = 0.22 (J)  S = 0.00 (J/K)  V = 0.67 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1697313.34 (J)  H = -1266104.61 (J)  S = 279.43 (J/K)  V = 40.99 (cc)  Cp = 143.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.67 | 0.00 | 3.26 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1697313.34 (J)  H = -1266104.61 (J)  S = 279.43 (J/K)  V = 40.99 (cc)  Cp = 143.08 (J/K)

Oxygen  delta moles = 8.24456e-06  delta grams = 0.000263816
G = -2.95 (J)  H = 0.35 (J)  S = 0.00 (J/K)  V = 1.06 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.43 (log 10 poise)  (analysis in wt %)
G = -1694525.45 (J)  H = -1267536.95 (J)  S = 278.50 (J/K)  V = 40.96 (cc)  Cp = 143.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.67 | 0.00 | 3.26 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1694525.45 (J)  H = -1267536.95 (J)  S = 278.50 (J/K)  V = 40.96 (cc)  Cp = 143.08 (J/K)

Oxygen  delta moles = 1.15744e-05  delta grams = 0.000370366
G = -4.11 (J)  H = 0.48 (J)  S = 0.00 (J/K)  V = 1.48 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.44 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1691747.05 (J)  H = -1268969.36 (J)  S = 277.57 (J/K)  V = 40.93 (cc)  Cp = 143.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.68 | 0.00 | 3.26 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.44 (gm/cc)
G = -1691747.05 (J)  H = -1268969.36 (J)  S = 277.57 (J/K)  V = 40.93 (cc)  Cp = 143.07 (J/K)

Oxygen  delta moles = 1.5209e-05  delta grams = 0.000486668
G = -5.36 (J)  H = 0.63 (J)  S = 0.00 (J/K)  V = 1.93 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.44 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -1688978.20 (J) H = -1270401.86 (J) S = 276.63 (J/K) V = 40.90 (cc) Cp = 143.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.68 | 0.00 | 3.26 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System mass = 100.00 (gm) density = 2.44 (gm/cc)
G = -1688978.20 (J) H = -1270401.86 (J) S = 276.63 (J/K) V = 40.90 (cc) Cp = 143.06 (J/K)

Oxygen delta moles = 1.91573e-05 delta grams = 0.00061301
G = -6.70 (J) H = 0.79 (J) S = 0.00 (J/K) V = 2.41 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1686218.99 (J) H = -1271834.44 (J) S = 275.68 (J/K) V = 40.88 (cc) Cp = 143.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.68 | 0.00 | 3.25 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1686218.99 (J) H = -1271834.44 (J) S = 275.68 (J/K) V = 40.88 (cc) Cp = 143.06 (J/K)

Oxygen delta moles = 2.34286e-05 delta grams = 0.000749688
G = -8.14 (J) H = 0.95 (J) S = 0.01 (J/K) V = 2.93 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1683469.46 (J) H = -1273267.12 (J) S = 274.72 (J/K) V = 40.85 (cc) Cp = 143.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.68 | 0.00 | 3.25 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1683469.46 (J) H = -1273267.12 (J) S = 274.72 (J/K) V = 40.85 (cc) Cp = 143.05 (J/K)

Oxygen delta moles = 2.80328e-05 delta grams = 0.000897015
G = -9.66 (J) H = 1.13 (J) S = 0.01 (J/K) V = 3.48 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1680729.69 (J) H = -1274699.89 (J) S = 273.76 (J/K) V = 40.82 (cc) Cp = 143.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.68 | 0.00 | 3.25 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1680729.69 (J) H = -1274699.89 (J) S = 273.76 (J/K) V = 40.82 (cc) Cp = 143.04 (J/K)

Oxygen delta moles = 3.29798e-05 delta grams = 0.00105531
G = -11.28 (J) H = 1.32 (J) S = 0.01 (J/K) V = 4.07 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1677999.63 (J) H = -1276078.82 (J) S = 272.83 (J/K) V = 40.79 (cc) Cp = 135.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.68 | 0.00 | 3.25 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1677999.63 (J) H = -1276078.82 (J) S = 272.83 (J/K) V = 40.79 (cc) Cp = 135.15 (J/K)

Oxygen delta moles = 3.82803e-05 delta grams = 0.00122492
G = -13.00 (J) H = 1.52 (J) S = 0.01 (J/K) V = 4.69 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.45 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1675278.96 (J) H = -1277432.89 (J) S = 271.91 (J/K) V = 40.76 (cc) Cp = 135.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.68 | 0.00 | 3.25 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.45 (gm/cc)
G = -1675278.96 (J) H = -1277432.89 (J) S = 271.91 (J/K) V = 40.76 (cc) Cp = 135.13 (J/K)

Oxygen delta moles = 4.39454e-05 delta grams = 0.0014062
G = -14.81 (J) H = 1.72 (J) S = 0.01 (J/K) V = 5.35 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1672567.73 (J) H = -1278786.88 (J) S = 270.98 (J/K) V = 40.73 (cc) Cp = 135.10 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.69 0.00 3.25 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1672567.73 (J) H = -1278786.88 (J) S = 270.98 (J/K) V = 40.73 (cc) Cp = 135.10 (J/K)

Oxygen delta moles = 4.99865e-05 delta grams = 0.00159951
G = -16.72 (J) H = 1.94 (J) S = 0.01 (J/K) V = 6.04 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1669865.99 (J) H = -1280140.79 (J) S = 270.05 (J/K) V = 40.70 (cc) Cp = 135.07 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.69 0.00 3.25 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1669865.99 (J) H = -1280140.79 (J) S = 270.05 (J/K) V = 40.70 (cc) Cp = 135.07 (J/K)

Oxygen delta moles = 5.64158e-05 delta grams = 0.00180524
G = -18.72 (J) H = 2.17 (J) S = 0.01 (J/K) V = 6.77 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1667173.82 (J) H = -1281494.61 (J) S = 269.11 (J/K) V = 40.67 (cc) Cp = 135.04 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

70.61 0.43 13.88 0.69 0.00 3.24 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1667173.82 (J) H = -1281494.61 (J) S = 269.11 (J/K) V = 40.67 (cc) Cp = 135.04 (J/K)

Oxygen delta moles = 6.32458e-05 delta grams = 0.00202379
G = -20.83 (J) H = 2.41 (J) S = 0.02 (J/K) V = 7.54 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1664491.28 (J) H = -1282848.34 (J) S = 268.17 (J/K) V = 40.64 (cc) Cp = 135.01 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.69 0.00 3.24 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1664491.28 (J) H = -1282848.34 (J) S = 268.17 (J/K) V = 40.64 (cc) Cp = 135.01 (J/K)

Oxygen delta moles = 7.04899e-05 delta grams = 0.00225559
G = -23.03 (J) H = 2.66 (J) S = 0.02 (J/K) V = 8.34 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1140.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.26 COH = 2.13 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1661818.46 (J) H = -1284201.97 (J) S = 267.22 (J/K) V = 40.62 (cc) Cp = 134.98 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.70 0.00 3.24 0.08 1.34 0.00 0.00 2.65 4.26 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1661818.46 (J) H = -1284201.97 (J) S = 267.22 (J/K) V = 40.62 (cc) Cp = 134.98 (J/K)

Oxygen delta moles = 7.81617e-05 delta grams = 0.00250108
G = -25.34 (J) H = 2.92 (J) S = 0.02 (J/K) V = 9.18 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -1659155.42 (J) H = -1285555.50 (J) S = 266.26 (J/K) V = 40.59 (cc) Cp = 134.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.24 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1659155.42 (J) H = -1285555.50 (J) S = 266.26 (J/K) V = 40.59 (cc) Cp = 134.95 (J/K)

Oxygen delta moles = 8.62757e-05 delta grams = 0.00276072
G = -27.75 (J) H = 3.20 (J) S = 0.02 (J/K) V = 10.07 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1120.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.25 COH = 2.09 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 5.37 (log 10 poise) (analysis in wt %)
G = -1656502.23 (J) H = -1286908.93 (J) S = 265.29 (J/K) V = 40.56 (cc) Cp = 134.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.70 | 0.00 | 3.23 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.26 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)

G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 5.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1656502.23 (J)  H = -1286908.93 (J)  S = 265.29 (J/K)  V = 40.56 (cc)  Cp = 134.91 (J/K)

Oxygen  delta moles = 9.48471e-05  delta grams = 0.00303499
G = -30.26 (J)  H = 3.48 (J)  S = 0.02 (J/K)  V = 10.99 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1110.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.24  COH = 2.07  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.53 (gm)  density = 2.47 (gm/cc)  viscosity = 5.48 (log 10 poise)  (analysis in wt %)
G = -1646793.59 (J)  H = -1282886.81 (J)  S = 263.10 (J/K)  V = 40.37 (cc)  Cp = 134.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.69 | 0.43 | 13.93 | 0.69 | 0.00 | 3.17 | 0.08 | 1.24 | 0.00 | 0.00 | 2.66 | 4.28 | 1.67 | 0.14 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.47 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.58Mg1.32Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -7045.78 (J)  H = -5536.17 (J)  S = 1.09 (J/K)  V = 0.14 (cc)  Cp = 0.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.59 | 96.33 | 57.98 | 3.86 | -3.67 | 5.76 | 0.33 |

Total solids  mass = 0.47 (gm)  density = 3.36 (gm/cc)
G = -7045.78 (J)  H = -5536.17 (J)  S = 1.09 (J/K)  V = 0.14 (cc)  Cp = 0.57 (J/K)

Viscosity of the System: 5.48 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1653839.37 (J)  H = -1288422.98 (J)  S = 264.19 (J/K)  V = 40.51 (cc)  Cp = 134.73 (J/K)

Oxygen  delta moles = 6.66744e-05  delta grams = 0.0021335
G = -21.10 (J)  H = 2.42 (J)  S = 0.02 (J/K)  V = 7.67 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1100.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.23  COH = 2.05  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.12 (gm)  density = 2.47 (gm/cc)  viscosity = 5.58 (log 10 poise)  (analysis in wt %)
G = -1638036.77 (J)  H = -1279563.51 (J)  S = 261.06 (J/K)  V = 40.20 (cc)  Cp = 133.49 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

70.77 0.44 13.98 0.68 0.00 3.10 0.08 1.15 0.00 0.00 2.67 4.30 1.68 0.14 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.89 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.60Mg1.30Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -13151.56 (J) H = -10350.02 (J) S = 2.04 (J/K) V = 0.26 (cc) Cp = 1.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.72 | 96.18 | 60.09 | 3.97 | -3.78 | 5.91 | 0.35 |

Total solids mass = 0.89 (gm) density = 3.37 (gm/cc)
G = -13151.56 (J) H = -10350.02 (J) S = 2.04 (J/K) V = 0.26 (cc) Cp = 1.07 (J/K)

Viscosity of the System: 5.59 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1651188.33 (J) H = -1289913.53 (J) S = 263.10 (J/K) V = 40.46 (cc) Cp = 134.56 (J/K)

Oxygen delta moles = 4.01619e-05 delta grams = 0.00128513
G = -12.61 (J) H = 1.44 (J) S = 0.01 (J/K) V = 4.59 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 98.71 (gm) density = 2.47 (gm/cc) viscosity = 5.68 (log 10 poise) (analysis in wt %)
G = -1629478.91 (J) H = -1276368.05 (J) S = 259.04 (J/K) V = 40.04 (cc) Cp = 132.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.85 | 0.44 | 14.03 | 0.67 | 0.00 | 3.04 | 0.08 | 1.06 | 0.00 | 0.00 | 2.67 | 4.32 | 1.69 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.29 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.62Mg1.27Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -19068.17 (J) H = -15029.82 (J) S = 2.96 (J/K) V = 0.38 (cc) Cp = 1.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.89 | 96.04 | 62.24 | 4.09 | -3.90 | 6.06 | 0.36 |

Total solids mass = 1.29 (gm) density = 3.38 (gm/cc)
G = -19068.17 (J) H = -15029.82 (J) S = 2.96 (J/K) V = 0.38 (cc) Cp = 1.56 (J/K)

Viscosity of the System: 5.70 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1648547.08 (J) H = -1291397.87 (J) S = 262.00 (J/K) V = 40.42 (cc) Cp = 134.39 (J/K)

Oxygen delta moles = 1.15197e-05 delta grams = 0.000368615
G = -3.59 (J) H = 0.41 (J) S = 0.00 (J/K) V = 1.31 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1080.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.22  COH = 2.01  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.31 (gm)  density = 2.47 (gm/cc)  viscosity = 5.79 (log 10 poise)  (analysis in wt %)
G = -1621106.04 (J)  H = -1273290.48 (J)  S = 257.04 (J/K)  V = 39.87 (cc)  Cp = 132.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.92 | 0.44 | 14.08 | 0.66 | 0.00 | 2.97 | 0.08 | 0.98 | 0.00 | 0.00 | 2.68 | 4.34 | 1.69 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.69 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.64Mg1.25Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -24809.59 (J)  H = -19585.90 (J)  S = 3.86 (J/K)  V = 0.50 (cc)  Cp = 2.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.11 | 95.89 | 64.43 | 4.22 | -4.03 | 6.23 | 0.37 |

Total solids  mass = 1.69 (gm)  density = 3.39 (gm/cc)
G = -24809.59 (J)  H = -19585.90 (J)  S = 3.86 (J/K)  V = 0.50 (cc)  Cp = 2.04 (J/K)

Viscosity of the System: 5.81 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1645915.64 (J)  H = -1292876.38 (J)  S = 260.90 (J/K)  V = 40.37 (cc)  Cp = 134.23 (J/K)

Oxygen  delta moles = -1.93491e-05  delta grams = -0.000619149
G = 5.98 (J)  H = -0.68 (J)  S = -0.00 (J/K)  V = -2.18 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1070.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.22  COH = 1.99  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.91 (gm)  density = 2.47 (gm/cc)  viscosity = 5.89 (log 10 poise)  (analysis in wt %)
G = -1612905.99 (J)  H = -1270322.04 (J)  S = 255.06 (J/K)  V = 39.72 (cc)  Cp = 131.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.01 | 0.44 | 14.12 | 0.65 | 0.00 | 2.89 | 0.08 | 0.90 | 0.00 | 0.00 | 2.69 | 4.35 | 1.70 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.09 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.67Mg1.22Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -30388.00 (J)  H = -24027.34 (J)  S = 4.74 (J/K)  V = 0.61 (cc)  Cp = 2.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.37 | 95.74 | 66.65 | 4.36 | -4.17 | 6.41 | 0.38 |

Total solids  mass = 2.09 (gm)  density = 3.40 (gm/cc)
G = -30388.00 (J)  H = -24027.34 (J)  S = 4.74 (J/K)  V = 0.61 (cc)  Cp = 2.50 (J/K)

Viscosity of the System: 5.92 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1643293.99 (J) H = -1294349.38 (J) S = 259.80 (J/K) V = 40.33 (cc) Cp = 134.07 (J/K)

Oxygen delta moles = -5.25242e-05 delta grams = -0.00168071
G = 16.09 (J) H = -1.83 (J) S = -0.01 (J/K) V = -5.87 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1060.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.21 COH = 1.97 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 94.18 (gm) density = 2.46 (gm/cc) viscosity = 6.00 (log 10 poise) (analysis in wt %)
G = -1549348.10 (J) H = -1223430.67 (J) S = 244.47 (J/K) V = 38.25 (cc) Cp = 126.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.46 | 0.46 | 13.85 | 0.65 | 0.00 | 2.86 | 0.09 | 0.82 | 0.00 | 0.00 | 2.59 | 4.26 | 1.76 | 0.15 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.69 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.19Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -38787.41 (J) H = -30698.77 (J) S = 6.07 (J/K) V = 0.79 (cc) Cp = 3.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.06 | 95.85 | 70.20 | 4.34 | -4.15 | 6.45 | 0.38 |

feldspar mass = 3.12 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.02Na0.70Ca0.28Al1.28Si2.72O8
G = -52529.53 (J) H = -42549.29 (J) S = 7.49 (J/K) V = 1.20 (cc) Cp = 3.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.77 | 28.03 | 2.20 |

Total solids mass = 5.81 (gm) density = 2.92 (gm/cc)
G = -91316.94 (J) H = -73248.06 (J) S = 13.55 (J/K) V = 1.99 (cc) Cp = 7.03 (J/K)

Viscosity of the System: 6.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1640665.04 (J) H = -1296678.73 (J) S = 258.03 (J/K) V = 40.24 (cc) Cp = 133.29 (J/K)

Oxygen delta moles = -0.00012575 delta grams = -0.00402384
G = 38.20 (J) H = -4.34 (J) S = -0.03 (J/K) V = -13.94 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1050.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.95 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 88.43 (gm) density = 2.46 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -1452244.81 (J) H = -1149258.77 (J) S = 228.99 (J/K) V = 35.95 (cc) Cp = 118.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.63 | 0.49 | 13.70 | 0.65 | 0.00 | 2.86 | 0.09 | 0.74 | 0.00 | 0.00 | 2.51 | 4.18 | 1.85 | 0.16 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.35 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.74Mg1.15Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -47795.48 (J) H = -37862.08 (J) S = 7.51 (J/K) V = 0.98 (cc) Cp = 3.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.06 | 95.97 | 73.95 | 4.39 | -4.19 | 6.58 | 0.37 |

feldspar mass = 6.91 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.02Na0.70Ca0.27Al1.27Si2.73O8
G = -116172.45 (J) H = -94309.71 (J) S = 16.52 (J/K) V = 2.66 (cc) Cp = 8.45 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.24 | 27.41 | 2.35 |

quartz mass = 1.30 (gm) density = 2.55 (gm/cc)
SiO2
G = -21835.64 (J) H = -17943.43 (J) S = 2.94 (J/K) V = 0.51 (cc) Cp = 1.55 (J/K)

Total solids mass = 11.56 (gm) density = 2.79 (gm/cc)
G = -185803.57 (J) H = -150115.22 (J) S = 26.97 (J/K) V = 4.14 (cc) Cp = 13.97 (J/K)

Viscosity of the System: 6.26 (log 10 poise)

System mass = 99.99 (gm) density = 2.49 (gm/cc)
G = -1638048.38 (J) H = -1299373.99 (J) S = 255.96 (J/K) V = 40.10 (cc) Cp = 132.35 (J/K)

Oxygen delta moles = -0.000210307 delta grams = -0.00672956
G = 63.35 (J) H = -7.18 (J) S = -0.05 (J/K) V = -23.14 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1040.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.93 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 81.28 (gm) density = 2.46 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -1332246.50 (J) H = -1056182.91 (J) S = 210.23 (J/K) V = 33.08 (cc) Cp = 108.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.52 | 0.53 | 13.65 | 0.66 | 0.00 | 2.90 | 0.10 | 0.67 | 0.00 | 0.00 | 2.45 | 4.13 | 1.99 | 0.17 | 1.23 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.04 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.78Mg1.11Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -56967.24 (J) H = -45166.48 (J) S = 8.99 (J/K) V = 1.17 (cc) Cp = 4.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.22 | 96.08 | 77.77 | 4.49 | -4.28 | 6.79 | 0.37 |

feldspar mass = 11.05 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.70Ca0.27Al1.27Si2.73O8
G = -185412.34 (J) H = -150855.99 (J) S = 26.32 (J/K) V = 4.25 (cc) Cp = 13.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.48 | 26.97 | 2.55 |

quartz mass = 3.63 (gm) density = 2.55 (gm/cc)
SiO2
G = -60823.99 (J) H = -50092.55 (J) S = 8.17 (J/K) V = 1.42 (cc) Cp = 4.32 (J/K)

Total solids mass = 18.71 (gm) density = 2.74 (gm/cc)
G = -303203.57 (J) H = -246115.02 (J) S = 43.47 (J/K) V = 6.84 (cc) Cp = 22.57 (J/K)

Viscosity of the System: 6.42 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1635450.07 (J) H = -1302297.93 (J) S = 253.70 (J/K) V = 39.91 (cc) Cp = 131.32 (J/K)

Oxygen delta moles = -0.000302727 delta grams = -0.0096869
G = 90.43 (J) H = -10.23 (J) S = -0.08 (J/K) V = -33.05 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1030.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.19 COH = 1.91 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 75.02 (gm) density = 2.45 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -1227627.36 (J) H = -975026.72 (J) S = 193.84 (J/K) V = 30.56 (cc) Cp = 100.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.41 | 0.57 | 13.61 | 0.67 | 0.00 | 2.90 | 0.11 | 0.61 | 0.00 | 0.00 | 2.39 | 4.08 | 2.13 | 0.19 | 1.34 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.66 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.81Mg1.07Fe"'0.03Ti0.00Al0.12Si1.93O6
G = -65126.48 (J) H = -51685.72 (J) S = 10.31 (J/K) V = 1.35 (cc) Cp = 5.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.19 | 96.20 | 81.41 | 4.59 | -4.37 | 7.00 | 0.36 |

feldspar mass = 14.66 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.27Al1.27Si2.73O8
G = -245699.55 (J) H = -200356.31 (J) S = 34.80 (J/K) V = 5.64 (cc) Cp = 18.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.68 | 26.56 | 2.76 |

quartz mass = 5.64 (gm) density = 2.55 (gm/cc)
SiO2
G = -94421.06 (J) H = -77933.43 (J) S = 12.65 (J/K) V = 2.21 (cc) Cp = 6.70 (J/K)

Total solids mass = 24.96 (gm) density = 2.72 (gm/cc)

G = -405247.09 (J)  H = -329975.46 (J)  S = 57.76 (J/K)  V = 9.19 (cc)  Cp = 30.23 (J/K)

Viscosity of the System: 6.59 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.52 (gm/cc)
G = -1632874.45 (J)  H = -1305002.18 (J)  S = 251.60 (J/K)  V = 39.75 (cc)  Cp = 130.57 (J/K)

Oxygen  delta moles = -0.000393604  delta grams = -0.0125949
G = 116.58 (J)  H = -13.16 (J)  S = -0.10 (J/K)  V = -42.65 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1020.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.18  COH = 1.89  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 69.51 (gm)  density = 2.45 (gm/cc)  viscosity = 6.05 (log 10 poise)  (analysis in wt %)
G = -1135638.03 (J)  H = -903654.01 (J)  S = 179.39 (J/K)  V = 28.35 (cc)  Cp = 92.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.32 | 0.62 | 13.57 | 0.67 | 0.00 | 2.89 | 0.12 | 0.56 | 0.00 | 0.00 | 2.34 | 4.02 | 2.26 | 0.20 | 1.44 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.24 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.04Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -72437.33 (J)  H = -57550.68 (J)  S = 11.51 (J/K)  V = 1.51 (cc)  Cp = 6.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.94 | 96.32 | 84.82 | 4.69 | -4.45 | 7.21 | 0.36 |

feldspar  mass = 17.85 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -298609.59 (J)  H = -244049.51 (J)  S = 42.19 (J/K)  V = 6.86 (cc)  Cp = 21.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.85 | 26.19 | 2.96 |

quartz  mass = 7.39 (gm)  density = 2.55 (gm/cc)
SiO2
G = -123635.34 (J)  H = -102270.88 (J)  S = 16.52 (J/K)  V = 2.89 (cc)  Cp = 8.78 (J/K)

Total solids  mass = 30.48 (gm)  density = 2.71 (gm/cc)
G = -494682.26 (J)  H = -403871.07 (J)  S = 70.22 (J/K)  V = 11.26 (cc)  Cp = 36.86 (J/K)

Viscosity of the System: 6.78 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.52 (gm/cc)
G = -1630320.29 (J)  H = -1307525.09 (J)  S = 249.62 (J/K)  V = 39.61 (cc)  Cp = 129.79 (J/K)

Oxygen  delta moles = -0.000482647  delta grams = -0.0154441
G = 141.73 (J)  H = -15.97 (J)  S = -0.12 (J/K)  V = -51.89 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1010.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.18  COH = 1.86
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 64.61 (gm)  density = 2.45 (gm/cc)  viscosity = 6.06 (log 10 poise)  (analysis in wt %)
G = -1054186.01 (J)  H = -840439.49 (J)  S = 166.58 (J/K)  V = 26.39 (cc)  Cp = 86.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.23 | 0.66 | 13.54 | 0.67 | 0.00 | 2.85 | 0.12 | 0.51 | 0.00 | 0.00 | 2.29 | 3.96 | 2.40 | 0.22 | 1.55 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.77 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.88Mg1.01Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -79015.15 (J)  H = -62853.58 (J)  S = 12.60 (J/K)  V = 1.65 (cc)  Cp = 6.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.42 | 96.44 | 87.99 | 4.78 | -4.53 | 7.39 | 0.35 |

feldspar  mass = 20.67 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -345346.77 (J)  H = -282882.01 (J)  S = 48.68 (J/K)  V = 7.94 (cc)  Cp = 25.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.99 | 25.86 | 3.16 |

quartz  mass = 8.93 (gm)  density = 2.55 (gm/cc)
SiO2
G = -149238.75 (J)  H = -123720.95 (J)  S = 19.89 (J/K)  V = 3.50 (cc)  Cp = 10.61 (J/K)

Total solids  mass = 35.37 (gm)  density = 2.70 (gm/cc)
G = -573600.67 (J)  H = -469456.53 (J)  S = 81.16 (J/K)  V = 13.09 (cc)  Cp = 42.72 (J/K)

Viscosity of the System: 7.00 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.53 (gm/cc)
G = -1627786.68 (J)  H = -1309896.02 (J)  S = 247.74 (J/K)  V = 39.48 (cc)  Cp = 129.08 (J/K)

Oxygen  delta moles = -0.000569459  delta grams = -0.018222
G = 165.78 (J)  H = -18.63 (J)  S = -0.14 (J/K)  V = -60.75 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1000.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.17  COH = 1.84
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 60.24 (gm)  density = 2.45 (gm/cc)  viscosity = 6.06 (log 10 poise)  (analysis in wt %)
G = -981634.14 (J)  H = -784111.85 (J)  S = 155.14 (J/K)  V = 24.63 (cc)  Cp = 80.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.14 | 0.71 | 13.51 | 0.66 | 0.00 | 2.79 | 0.13 | 0.46 | 0.00 | 0.00 | 2.25 | 3.90 | 2.54 | 0.23 | 1.67 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.25 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.98Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -84943.68 (J) H = -67661.27 (J) S = 13.57 (J/K) V = 1.78 (cc) Cp = 7.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.63 | 96.55 | 90.91 | 4.88 | -4.61 | 7.56 | 0.34 |

feldspar mass = 23.19 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -386859.07 (J) H = -317598.47 (J) S = 54.40 (J/K) V = 8.91 (cc) Cp = 28.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.09 | 25.55 | 3.36 |

quartz mass = 10.30 (gm) density = 2.55 (gm/cc)
SiO2
G = -171835.99 (J) H = -142766.33 (J) S = 22.83 (J/K) V = 4.03 (cc) Cp = 12.22 (J/K)

Total solids mass = 39.74 (gm) density = 2.70 (gm/cc)
G = -643638.75 (J) H = -528026.06 (J) S = 90.81 (J/K) V = 14.73 (cc) Cp = 47.94 (J/K)

Viscosity of the System: 7.26 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1625272.89 (J) H = -1312137.92 (J) S = 245.95 (J/K) V = 39.36 (cc) Cp = 128.44 (J/K)

Oxygen delta moles = -0.000653625 delta grams = -0.0209152
G = 188.64 (J) H = -21.15 (J) S = -0.16 (J/K) V = -69.19 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 990.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.16 COH = 1.82 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 56.31 (gm) density = 2.44 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -916676.37 (J) H = -733657.26 (J) S = 144.89 (J/K) V = 23.06 (cc) Cp = 75.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.06 | 0.76 | 13.49 | 0.65 | 0.00 | 2.72 | 0.14 | 0.43 | 0.00 | 0.00 | 2.22 | 3.83 | 2.67 | 0.25 | 1.78 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.70 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.95Fe"'0.03Ti0.00Al0.13Si1.92O6
G = -90286.46 (J) H = -72024.22 (J) S = 14.46 (J/K) V = 1.90 (cc) Cp = 7.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.56 | 96.65 | 93.57 | 4.96 | -4.67 | 7.71 | 0.34 |

feldspar mass = 25.45 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -423907.04 (J) H = -348796.12 (J) S = 59.46 (J/K) V = 9.78 (cc) Cp = 31.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.18 | 25.27 | 3.56 |

quartz mass = 11.51 (gm) density = 2.55 (gm/cc)
SiO2
G = -191908.42 (J) H = -159791.42 (J) S = 25.43 (J/K) V = 4.51 (cc) Cp = 13.66 (J/K)

Total solids mass = 43.67 (gm) density = 2.70 (gm/cc)
G = -706101.93 (J) H = -580611.75 (J) S = 99.35 (J/K) V = 16.19 (cc) Cp = 52.60 (J/K)

Viscosity of the System: 7.57 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1622778.29 (J) H = -1314269.01 (J) S = 244.24 (J/K) V = 39.25 (cc) Cp = 127.85 (J/K)

Oxygen delta moles = -0.000734765 delta grams = -0.0235116
G = 210.20 (J) H = -23.52 (J) S = -0.19 (J/K) V = -77.17 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 980.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.15 COH = 1.80 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 52.77 (gm) density = 2.44 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -858251.88 (J) H = -688252.63 (J) S = 135.66 (J/K) V = 21.64 (cc) Cp = 70.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.98 | 0.81 | 13.47 | 0.64 | 0.00 | 2.63 | 0.15 | 0.39 | 0.00 | 0.00 | 2.19 | 3.77 | 2.81 | 0.27 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.11 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.92Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -95094.75 (J) H = -75982.72 (J) S = 15.25 (J/K) V = 2.01 (cc) Cp = 8.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.22 | 96.75 | 95.99 | 5.04 | -4.73 | 7.84 | 0.33 |

feldspar mass = 27.49 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -457111.29 (J) H = -376962.25 (J) S = 63.96 (J/K) V = 10.56 (cc) Cp = 33.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.24 | 25.01 | 3.75 |

quartz mass = 12.61 (gm) density = 2.55 (gm/cc)
SiO2
G = -209844.45 (J) H = -175106.54 (J) S = 27.72 (J/K) V = 4.94 (cc) Cp = 14.94 (J/K)

Total solids mass = 47.21 (gm) density = 2.70 (gm/cc)
G = -762050.49 (J) H = -628051.51 (J) S = 106.93 (J/K) V = 17.51 (cc) Cp = 56.79 (J/K)

Viscosity of the System: 8.01 (log 10 poise)

System mass = 99.97 (gm) density = 2.55 (gm/cc)
G = -1620302.37 (J) H = -1316304.14 (J) S = 242.59 (J/K) V = 39.15 (cc) Cp = 127.31 (J/K)

Oxygen delta moles = -0.00081257 delta grams = -0.0260013
G = 230.41 (J) H = -25.72 (J) S = -0.20 (J/K) V = -84.66 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 970.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.15 COH = 1.77 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 49.57 (gm) density = 2.43 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -805485.28 (J) H = -647219.12 (J) S = 127.31 (J/K) V = 20.36 (cc) Cp = 66.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.90 | 0.86 | 13.45 | 0.62 | 0.00 | 2.53 | 0.16 | 0.36 | 0.00 | 0.00 | 2.16 | 3.70 | 2.95 | 0.28 | 2.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.48 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.90Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -99412.64 (J) H = -79570.97 (J) S = 15.96 (J/K) V = 2.11 (cc) Cp = 8.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.61 | 96.84 | 98.17 | 5.12 | -4.79 | 7.94 | 0.32 |

feldspar mass = 29.33 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -486985.63 (J) H = -402500.34 (J) S = 67.96 (J/K) V = 11.27 (cc) Cp = 35.90 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.28 | 24.78 | 3.95 |

quartz mass = 13.59 (gm) density = 2.55 (gm/cc)
SiO2
G = -225961.10 (J) H = -188965.14 (J) S = 29.76 (J/K) V = 5.32 (cc) Cp = 16.10 (J/K)

Total solids mass = 50.41 (gm) density = 2.70 (gm/cc)
G = -812359.37 (J) H = -671036.44 (J) S = 113.68 (J/K) V = 18.70 (cc) Cp = 60.56 (J/K)

Viscosity of the System: 8.80 (log 10 poise)

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1617844.64 (J) H = -1318255.57 (J) S = 240.99 (J/K) V = 39.06 (cc) Cp = 126.81 (J/K)

Oxygen delta moles = -0.000886818 delta grams = -0.0283771
G = 249.24 (J) H = -27.75 (J) S = -0.22 (J/K) V = -91.66 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 46.66 (gm) density = 2.43 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -757644.48 (J) H = -609989.37 (J) S = 119.74 (J/K) V = 19.19 (cc) Cp = 62.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.81 | 0.91 | 13.44 | 0.60 | 0.00 | 2.42 | 0.17 | 0.33 | 0.00 | 0.00 | 2.14 | 3.63 | 3.09 | 0.30 | 2.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.82 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.88Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -103280.10 (J) H = -82819.55 (J) S = 16.59 (J/K) V = 2.20 (cc) Cp = 8.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.74 | 96.92 | 100.13 | 5.19 | -4.84 | 8.02 | 0.32 |

feldspar mass = 31.00 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -513960.57 (J) H = -425748.57 (J) S = 71.53 (J/K) V = 11.91 (cc) Cp = 37.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.30 | 24.56 | 4.14 |

quartz mass = 14.49 (gm) density = 2.55 (gm/cc)
SiO2
G = -240519.51 (J) H = -201576.14 (J) S = 31.58 (J/K) V = 5.67 (cc) Cp = 17.14 (J/K)

Total solids mass = 53.31 (gm) density = 2.69 (gm/cc)
G = -857760.18 (J) H = -710144.25 (J) S = 119.71 (J/K) V = 19.78 (cc) Cp = 63.98 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1615404.66 (J) H = -1320133.62 (J) S = 239.44 (J/K) V = 38.98 (cc) Cp = 126.35 (J/K)

Oxygen delta moles = -0.000957376 delta grams = -0.0306349
G = 266.67 (J) H = -29.61 (J) S = -0.24 (J/K) V = -98.16 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 43.72 (gm) density = 2.42 (gm/cc) viscosity = 6.06 (log 10 poise) (analysis in wt %)
G = -709718.14 (J) H = -572552.50 (J) S = 112.14 (J/K) V = 18.03 (cc) Cp = 58.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.81 | 0.86 | 13.44 | 0.57 | 0.00 | 2.29 | 0.18 | 0.31 | 0.00 | 0.00 | 2.11 | 3.57 | 3.23 | 0.32 | 2.30 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.07 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.87Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -106047.54 (J) H = -85219.71 (J) S = 17.03 (J/K) V = 2.27 (cc) Cp = 9.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.19 | 96.99 | 101.52 | 5.22 | -4.88 | 8.04 | 0.31 |

feldspar mass = 32.65 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.24Al1.24Si2.76O8
G = -540389.00 (J) H = -448644.39 (J) S = 75.01 (J/K) V = 12.54 (cc) Cp = 39.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.24 | 24.39 | 4.37 |

quartz mass = 15.43 (gm) density = 2.55 (gm/cc)
SiO2
G = -255735.84 (J) H = -214792.34 (J) S = 33.47 (J/K) V = 6.04 (cc) Cp = 18.24 (J/K)

rhm-oxide mass = 0.11 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.10Fe'''0.21Al0.12Ti0.83O3
G = -1103.31 (J) H = -839.51 (J) S = 0.22 (J/K) V = 0.02 (cc) Cp = 0.11 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.22 | 10.57 | 70.80 | 2.17 | 6.24 |

Total solids mass = 56.25 (gm) density = 2.70 (gm/cc)
G = -903275.68 (J) H = -749495.95 (J) S = 125.72 (J/K) V = 20.87 (cc) Cp = 67.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1612993.83 (J) H = -1322048.45 (J) S = 237.87 (J/K) V = 38.90 (cc) Cp = 125.87 (J/K)

Oxygen delta moles = -0.00100272 delta grams = -0.0320858
G = 276.78 (J) H = -30.66 (J) S = -0.25 (J/K) V = -101.97 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 41.05 (gm) density = 2.42 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -666296.43 (J) H = -538596.69 (J) S = 105.26 (J/K) V = 16.97 (cc) Cp = 54.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.80 | 0.81 | 13.45 | 0.55 | 0.00 | 2.15 | 0.19 | 0.29 | 0.00 | 0.00 | 2.09 | 3.51 | 3.38 | 0.34 | 2.44 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.29 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.86Fe'''0.03Ti0.00Al0.14Si1.92O6
G = -108441.43 (J) H = -87335.85 (J) S = 17.40 (J/K) V = 2.33 (cc) Cp = 9.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.46 | 97.04 | 102.74 | 5.24 | -4.92 | 8.05 | 0.30 |

feldspar mass = 34.14 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -564253.26 (J) H = -469505.38 (J) S = 78.10 (J/K) V = 13.11 (cc) Cp = 41.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.17 | 24.23 | 4.60 |

quartz mass = 16.28 (gm) density = 2.55 (gm/cc)
SiO2
G = -269524.34 (J) H = -226861.71 (J) S = 35.17 (J/K) V = 6.37 (cc) Cp = 19.23 (J/K)

rhm-oxide mass = 0.21 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.10Fe'''0.21Al0.12Ti0.83O3
G = -2084.28 (J) H = -1590.59 (J) S = 0.41 (J/K) V = 0.05 (cc) Cp = 0.20 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.99 | 10.50 | 71.12 | 2.27 | 6.11 |

Total solids mass = 58.91 (gm) density = 2.70 (gm/cc)
G = -944303.31 (J) H = -785293.53 (J) S = 131.07 (J/K) V = 21.85 (cc) Cp = 70.50 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1610599.74 (J) H = -1323890.23 (J) S = 236.33 (J/K) V = 38.83 (cc) Cp = 125.42 (J/K)

Oxygen delta moles = -0.0010459 delta grams = -0.0334677
G = 286.08 (J) H = -31.61 (J) S = -0.26 (J/K) V = -105.50 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 38.64 (gm) density = 2.41 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -626903.07 (J) H = -507756.94 (J) S = 99.03 (J/K) V = 16.01 (cc) Cp = 51.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.77 | 0.76 | 13.46 | 0.52 | 0.00 | 2.01 | 0.20 | 0.27 | 0.00 | 0.00 | 2.07 | 3.45 | 3.53 | 0.36 | 2.60 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.48 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.85Fe'''0.03Ti0.00Al0.14Si1.92O6
G = -110529.87 (J) H = -89220.01 (J) S = 17.71 (J/K) V = 2.38 (cc) Cp = 9.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.57 | 97.10 | 103.82 | 5.26 | -4.96 | 8.04 | 0.30 |

feldspar mass = 35.50 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -585840.45 (J) H = -488556.60 (J) S = 80.86 (J/K) V = 13.63 (cc) Cp = 43.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.08 | 24.08 | 4.83 |

quartz mass = 17.06 (gm) density = 2.55 (gm/cc)
SiO2
G = -282024.35 (J) H = -237893.92 (J) S = 36.68 (J/K) V = 6.68 (cc) Cp = 20.13 (J/K)

rhm-oxide mass = 0.29 (gm) density = 4.62 (gm/cc) (analysis in mole %)

Mn0.02Fe"0.71Mg0.10Fe'''0.21Al0.12Ti0.84O3
G = -2923.74 (J) H = -2237.91 (J) S = 0.57 (J/K) V = 0.06 (cc) Cp = 0.28 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.78 | 10.42 | 71.44 | 2.38 | 5.99 |

Total solids mass = 61.33 (gm) density = 2.70 (gm/cc)
G = -981318.41 (J) H = -817908.45 (J) S = 135.82 (J/K) V = 22.75 (cc) Cp = 73.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1608221.48 (J) H = -1325665.39 (J) S = 234.85 (J/K) V = 38.76 (cc) Cp = 125.00 (J/K)

Oxygen delta moles = -0.00108777 delta grams = -0.0348074
G = 294.81 (J) H = -32.48 (J) S = -0.27 (J/K) V = -108.81 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 36.43 (gm) density = 2.41 (gm/cc) viscosity = 6.03 (log 10 poise) (analysis in wt %)
G = -590978.88 (J) H = -479598.84 (J) S = 93.35 (J/K) V = 15.13 (cc) Cp = 48.78 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.73 | 0.71 | 13.48 | 0.49 | 0.00 | 1.89 | 0.21 | 0.25 | 0.00 | 0.00 | 2.05 | 3.38 | 3.67 | 0.39 | 2.75 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.65 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.84Fe'''0.03Ti0.00Al0.14Si1.92O6
G = -112348.42 (J) H = -90898.88 (J) S = 17.98 (J/K) V = 2.42 (cc) Cp = 9.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.55 | 97.16 | 104.79 | 5.28 | -4.99 | 8.03 | 0.29 |

feldspar mass = 36.74 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -605463.27 (J) H = -506046.69 (J) S = 83.32 (J/K) V = 14.11 (cc) Cp = 44.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.99 | 23.94 | 5.07 |

quartz mass = 17.77 (gm) density = 2.55 (gm/cc)
SiO2
G = -293422.86 (J) H = -248040.02 (J) S = 38.04 (J/K) V = 6.96 (cc) Cp = 20.95 (J/K)

rhm-oxide mass = 0.37 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.72Mg0.10Fe'''0.21Al0.12Ti0.84O3
G = -3645.25 (J) H = -2798.66 (J) S = 0.71 (J/K) V = 0.08 (cc) Cp = 0.35 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.60 | 10.31 | 71.75 | 2.48 | 5.87 |

Total solids mass = 63.53 (gm) density = 2.70 (gm/cc)

G = -1014879.80 (J)  H = -847784.24 (J)  S = 140.05 (J/K)  V = 23.56 (cc)  Cp = 75.84 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.58 (gm/cc)
G = -1605858.68 (J)  H = -1327383.08 (J)  S = 233.40 (J/K)  V = 38.69 (cc)  Cp = 124.62 (J/K)

Oxygen  delta moles = -0.00112827  delta grams = -0.0361032
G = 302.97 (J)  H = -33.29 (J)  S = -0.28 (J/K)  V = -111.93 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 910.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = 0.10  COH = 1.62  IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid  mass = 34.41 (gm)  density = 2.40 (gm/cc)  viscosity = 6.02 (log 10 poise)  (analysis in wt %)
G = -558057.37 (J)  H = -453759.97 (J)  S = 88.15 (J/K)  V = 14.32 (cc)  Cp = 46.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.67 | 0.67 | 13.49 | 0.47 | 0.00 | 1.76 | 0.22 | 0.23 | 0.00 | 0.00 | 2.04 | 3.32 | 3.81 | 0.41 | 2.92 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.81 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.83Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -113928.89 (J)  H = -92396.29 (J)  S = 18.20 (J/K)  V = 2.46 (cc)  Cp = 9.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.42 | 97.21 | 105.64 | 5.30 | -5.02 | 8.00 | 0.29 |

feldspar  mass = 37.89 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -623382.82 (J)  H = -522183.31 (J)  S = 85.53 (J/K)  V = 14.54 (cc)  Cp = 46.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.89 | 23.81 | 5.30 |

quartz  mass = 18.42 (gm)  density = 2.55 (gm/cc)
SiO2
G = -303874.18 (J)  H = -257424.67 (J)  S = 39.26 (J/K)  V = 7.21 (cc)  Cp = 21.71 (J/K)

rhm-oxide  mass = 0.43 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.20Al0.12Ti0.84O3
G = -4267.76 (J)  H = -3286.67 (J)  S = 0.83 (J/K)  V = 0.09 (cc)  Cp = 0.41 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.43 | 10.19 | 72.05 | 2.58 | 5.75 |

Total solids  mass = 65.55 (gm)  density = 2.70 (gm/cc)
G = -1045453.65 (J)  H = -875290.95 (J)  S = 143.82 (J/K)  V = 24.31 (cc)  Cp = 78.16 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.59 (gm/cc)
G = -1603511.02 (J)  H = -1329050.93 (J)  S = 231.97 (J/K)  V = 38.63 (cc)  Cp = 124.26 (J/K)

Oxygen delta moles = -0.00116735 delta grams = -0.0373538
G = 310.55 (J) H = -34.03 (J) S = -0.29 (J/K) V = -114.83 (cc) Cp = -0.04 (J/K)

**********_____**********
Title: felsic

T = 900.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.09 COH = 1.60 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 32.55 (gm) density = 2.40 (gm/cc) viscosity = 6.00 (log 10 poise) (analysis in wt %)
G = -527746.16 (J) H = -429935.40 (J) S = 83.37 (J/K) V = 13.58 (cc) Cp = 43.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.59 | 0.62 | 13.51 | 0.44 | 0.00 | 1.64 | 0.23 | 0.22 | 0.00 | 0.00 | 2.03 | 3.26 | 3.95 | 0.43 | 3.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.94 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.82Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -115299.63 (J) H = -93733.53 (J) S = 18.38 (J/K) V = 2.49 (cc) Cp = 10.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.18 | 97.26 | 106.41 | 5.32 | -5.06 | 7.97 | 0.28 |

feldspar mass = 38.94 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -639818.99 (J) H = -537141.50 (J) S = 87.52 (J/K) V = 14.95 (cc) Cp = 47.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.79 | 23.68 | 5.54 |

quartz mass = 19.03 (gm) density = 2.55 (gm/cc)
SiO2
G = -313506.82 (J) H = -266151.78 (J) S = 40.37 (J/K) V = 7.45 (cc) Cp = 22.40 (J/K)

rhm-oxide mass = 0.49 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.20Al0.11Ti0.84O3
G = -4806.64 (J) H = -3713.17 (J) S = 0.93 (J/K) V = 0.11 (cc) Cp = 0.46 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.27 | 10.05 | 72.36 | 2.68 | 5.64 |

Total solids mass = 67.41 (gm) density = 2.70 (gm/cc)
G = -1073432.07 (J) H = -900739.98 (J) S = 147.20 (J/K) V = 25.00 (cc) Cp = 80.28 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1601178.23 (J) H = -1330675.38 (J) S = 230.58 (J/K) V = 38.58 (cc) Cp = 123.92 (J/K)

Oxygen delta moles = -0.001205 delta grams = -0.0385586
G = 317.56 (J) H = -34.70 (J) S = -0.30 (J/K) V = -117.53 (cc) Cp = -0.04 (J/K)

**********_____**********
Title: felsic

T = 890.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.07  delta HM = -5.05  NNO = 0.00  QFM = 0.08  COH = 1.57  IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid  mass = 30.84 (gm)  density = 2.39 (gm/cc)  viscosity = 5.98 (log 10 poise)  (analysis in wt %)
G = -499712.52 (J)  H = -407866.40 (J)  S = 78.96 (J/K)  V = 12.89 (cc)  Cp = 41.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.49 | 0.59 | 13.53 | 0.42 | 0.00 | 1.53 | 0.24 | 0.21 | 0.00 | 0.00 | 2.02 | 3.20 | 4.08 | 0.46 | 3.25 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.06 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.07Mg0.82Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -116485.85 (J)  H = -94929.47 (J)  S = 18.53 (J/K)  V = 2.53 (cc)  Cp = 10.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.86 | 97.31 | 107.09 | 5.34 | -5.09 | 7.93 | 0.28 |

feldspar  mass = 39.92 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -654958.56 (J)  H = -551070.04 (J)  S = 89.32 (J/K)  V = 15.32 (cc)  Cp = 48.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.67 | 23.55 | 5.78 |

quartz  mass = 19.60 (gm)  density = 2.55 (gm/cc)
SiO2
G = -322428.70 (J)  H = -274308.66 (J)  S = 41.37 (J/K)  V = 7.67 (cc)  Cp = 23.05 (J/K)

rhm-oxide  mass = 0.54 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.20Al0.11Ti0.85O3
G = -5274.46 (J)  H = -4087.30 (J)  S = 1.02 (J/K)  V = 0.12 (cc)  Cp = 0.51 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.12 | 9.91 | 72.66 | 2.78 | 5.53 |

Total solids  mass = 69.12 (gm)  density = 2.70 (gm/cc)
G = -1099147.57 (J)  H = -924395.48 (J)  S = 150.24 (J/K)  V = 25.64 (cc)  Cp = 82.24 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.59 (gm/cc)
G = -1598860.08 (J)  H = -1332261.88 (J)  S = 229.20 (J/K)  V = 38.53 (cc)  Cp = 123.60 (J/K)

Oxygen  delta moles = -0.00124122  delta grams = -0.0397175
G = 324.01 (J)  H = -35.30 (J)  S = -0.31 (J/K)  V = -120.04 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 880.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -12.26  delta HM = -5.06  NNO = 0.00  QFM = 0.07  COH = 1.54  IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 29.24 (gm) density = 2.39 (gm/cc) viscosity = 5.96 (log 10 poise) (analysis in wt %)
G = -473672.12 (J) H = -387331.70 (J) S = 74.87 (J/K) V = 12.25 (cc) Cp = 39.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.37 | 0.55 | 13.55 | 0.40 | 0.00 | 1.42 | 0.25 | 0.19 | 0.00 | 0.00 | 2.01 | 3.14 | 4.21 | 0.48 | 3.43 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.17 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.08Mg0.81Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -117509.86 (J) H = -96000.88 (J) S = 18.65 (J/K) V = 2.55 (cc) Cp = 10.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.47 | 97.36 | 107.70 | 5.36 | -5.12 | 7.89 | 0.27 |

feldspar mass = 40.84 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -668961.50 (J) H = -564096.49 (J) S = 90.94 (J/K) V = 15.67 (cc) Cp = 49.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.55 | 23.43 | 6.02 |

quartz mass = 20.13 (gm) density = 2.55 (gm/cc)
SiO2
G = -330731.33 (J) H = -281969.41 (J) S = 42.29 (J/K) V = 7.88 (cc) Cp = 23.65 (J/K)

rhm-oxide mass = 0.58 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.20Al0.11Ti0.85O3
G = -5681.58 (J) H = -4416.61 (J) S = 1.10 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.99 | 9.76 | 72.96 | 2.87 | 5.43 |

Total solids mass = 70.72 (gm) density = 2.70 (gm/cc)
G = -1122884.26 (J) H = -946483.40 (J) S = 152.97 (J/K) V = 26.23 (cc) Cp = 84.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1596556.37 (J) H = -1333815.10 (J) S = 227.85 (J/K) V = 38.48 (cc) Cp = 123.30 (J/K)

Oxygen delta moles = -0.00127601 delta grams = -0.0408308
G = 329.92 (J) H = -35.84 (J) S = -0.32 (J/K) V = -122.34 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 27.76 (gm) density = 2.38 (gm/cc) viscosity = 5.93 (log 10 poise) (analysis in wt %)
G = -449380.03 (J) H = -368140.44 (J) S = 71.07 (J/K) V = 11.65 (cc) Cp = 37.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.23 | 0.51 | 13.57 | 0.37 | 0.00 | 1.32 | 0.26 | 0.18 | 0.00 | 0.00 | 2.00 | 3.07 | 4.34 | 0.51 | 3.62 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.26 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.08Mg0.81Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -118391.37 (J) H = -96962.57 (J) S = 18.75 (J/K) V = 2.58 (cc) Cp = 10.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.00 | 97.41 | 108.25 | 5.38 | -5.15 | 7.85 | 0.27 |

feldspar mass = 41.70 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -681966.00 (J) H = -576331.19 (J) S = 92.41 (J/K) V = 16.00 (cc) Cp = 50.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.42 | 23.31 | 6.27 |

quartz mass = 20.63 (gm) density = 2.55 (gm/cc)
SiO2
G = -338492.96 (J) H = -289197.47 (J) S = 43.12 (J/K) V = 8.08 (cc) Cp = 24.21 (J/K)

rhm-oxide mass = 0.62 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.19Al0.11Ti0.85O3
G = -6036.57 (J) H = -4707.36 (J) S = 1.16 (J/K) V = 0.13 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.86 | 9.60 | 73.25 | 2.97 | 5.33 |

Total solids mass = 72.20 (gm) density = 2.70 (gm/cc)
G = -1144886.90 (J) H = -967198.59 (J) S = 155.44 (J/K) V = 26.78 (cc) Cp = 85.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1594266.93 (J) H = -1335339.03 (J) S = 226.50 (J/K) V = 38.43 (cc) Cp = 123.01 (J/K)

Oxygen delta moles = -0.0013094 delta grams = -0.0418992
G = 335.30 (J) H = -36.31 (J) S = -0.33 (J/K) V = -124.45 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 860.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.06 COH = 1.48 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 26.36 (gm) density = 2.38 (gm/cc) viscosity = 5.89 (log 10 poise) (analysis in wt %)
G = -426623.47 (J) H = -350126.52 (J) S = 67.51 (J/K) V = 11.09 (cc) Cp = 35.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.08 | 0.48 | 13.60 | 0.35 | 0.00 | 1.23 | 0.27 | 0.17 | 0.00 | 0.00 | 2.00 | 3.01 | 4.47 | 0.53 | 3.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.34 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.81Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -119147.80 (J) H = -97827.62 (J) S = 18.81 (J/K) V = 2.60 (cc) Cp = 10.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.48 | 97.46 | 108.74 | 5.40 | -5.18 | 7.80 | 0.26 |

feldspar mass = 42.50 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -694092.55 (J) H = -587870.52 (J) S = 93.74 (J/K) V = 16.30 (cc) Cp = 51.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.28 | 23.20 | 6.52 |

quartz mass = 21.10 (gm) density = 2.55 (gm/cc)
SiO2
G = -345781.20 (J) H = -296047.74 (J) S = 43.89 (J/K) V = 8.26 (cc) Cp = 24.74 (J/K)

rhm-oxide mass = 0.65 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.09Fe'"0.19Al0.10Ti0.85O3
G = -6346.59 (J) H = -4964.74 (J) S = 1.22 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.73 | 9.43 | 73.55 | 3.06 | 5.23 |

Total solids mass = 73.59 (gm) density = 2.70 (gm/cc)
G = -1165368.13 (J) H = -986710.61 (J) S = 157.66 (J/K) V = 27.30 (cc) Cp = 87.31 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1591991.61 (J) H = -1336837.14 (J) S = 225.17 (J/K) V = 38.39 (cc) Cp = 122.75 (J/K)

Oxygen delta moles = -0.00134142 delta grams = -0.0429237
G = 340.17 (J) H = -36.72 (J) S = -0.33 (J/K) V = -126.38 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 850.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.05 COH = 1.46 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 25.05 (gm) density = 2.37 (gm/cc) viscosity = 5.85 (log 10 poise) (analysis in wt %)
G = -405215.84 (J) H = -333143.95 (J) S = 64.17 (J/K) V = 10.56 (cc) Cp = 33.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.90 | 0.45 | 13.63 | 0.33 | 0.00 | 1.14 | 0.28 | 0.16 | 0.00 | 0.00 | 2.00 | 2.96 | 4.59 | 0.56 | 4.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.42 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.80Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -119794.46 (J) H = -98607.59 (J) S = 18.86 (J/K) V = 2.62 (cc) Cp = 10.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.91 | 97.52 | 109.18 | 5.42 | -5.22 | 7.75 | 0.26 |

feldspar mass = 43.26 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -705447.25 (J) H = -598799.55 (J) S = 94.95 (J/K) V = 16.59 (cc) Cp = 52.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.13 | 23.09 | 6.77 |

quartz mass = 21.55 (gm) density = 2.55 (gm/cc)
SiO2
G = -352655.08 (J) H = -302568.23 (J) S = 44.59 (J/K) V = 8.44 (cc) Cp = 25.24 (J/K)

rhm-oxide mass = 0.68 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.09Fe'"0.19Al0.10Ti0.86O3
G = -6617.64 (J) H = -5193.13 (J) S = 1.27 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.61 | 9.26 | 73.85 | 3.14 | 5.14 |

Total solids mass = 74.90 (gm) density = 2.70 (gm/cc)
G = -1184514.44 (J) H = -1005168.50 (J) S = 159.68 (J/K) V = 27.79 (cc) Cp = 88.79 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1589730.27 (J) H = -1338312.45 (J) S = 223.85 (J/K) V = 38.34 (cc) Cp = 122.49 (J/K)

Oxygen delta moles = -0.0013721 delta grams = -0.0439055
G = 344.55 (J) H = -37.08 (J) S = -0.34 (J/K) V = -128.13 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 23.81 (gm) density = 2.37 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -384991.71 (J) H = -317062.90 (J) S = 61.02 (J/K) V = 10.05 (cc) Cp = 32.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.69 | 0.42 | 13.66 | 0.31 | 0.00 | 1.06 | 0.29 | 0.15 | 0.00 | 0.00 | 2.00 | 2.90 | 4.70 | 0.59 | 4.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.48 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.80Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -120344.88 (J) H = -99312.70 (J) S = 18.89 (J/K) V = 2.63 (cc) Cp = 10.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.30 | 97.57 | 109.58 | 5.45 | -5.25 | 7.71 | 0.25 |

feldspar mass = 43.98 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -716124.64 (J) H = -609194.29 (J) S = 96.06 (J/K) V = 16.86 (cc) Cp = 53.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.98 | 22.99 | 7.04 |

quartz mass = 21.97 (gm) density = 2.55 (gm/cc)
SiO2
G = -359166.82 (J) H = -308801.53 (J) S = 45.25 (J/K) V = 8.60 (cc) Cp = 25.71 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.65 (gm/cc) (analysis in mole %)

Mn0.03Fe"0.74Mg0.08Fe'"0.18Al0.10Ti0.86O3
G = -6854.79 (J) H = -5396.24 (J) S = 1.31 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.50 | 9.09 | 74.15 | 3.22 | 5.05 |

Total solids mass = 76.14 (gm) density = 2.70 (gm/cc)
G = -1202491.12 (J) H = -1022704.74 (J) S = 161.51 (J/K) V = 28.25 (cc) Cp = 90.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1587482.83 (J) H = -1339767.64 (J) S = 222.54 (J/K) V = 38.30 (cc) Cp = 122.25 (J/K)

Oxygen delta moles = -0.00140149 delta grams = -0.0448459
G = 348.46 (J) H = -37.38 (J) S = -0.35 (J/K) V = -129.71 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 22.64 (gm) density = 2.36 (gm/cc) viscosity = 5.76 (log 10 poise) (analysis in wt %)
G = -365802.60 (J) H = -301766.36 (J) S = 58.05 (J/K) V = 9.57 (cc) Cp = 30.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.46 | 0.39 | 13.70 | 0.30 | 0.00 | 0.98 | 0.30 | 0.15 | 0.00 | 0.00 | 2.01 | 2.84 | 4.82 | 0.62 | 4.43 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.54 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.80Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -120810.95 (J) H = -99951.95 (J) S = 18.91 (J/K) V = 2.65 (cc) Cp = 10.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.65 | 97.62 | 109.93 | 5.48 | -5.29 | 7.66 | 0.25 |

feldspar mass = 44.67 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -726210.06 (J) H = -619123.63 (J) S = 97.07 (J/K) V = 17.12 (cc) Cp = 54.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.81 | 22.88 | 7.31 |

quartz mass = 22.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -365363.23 (J) H = -314785.95 (J) S = 45.85 (J/K) V = 8.76 (cc) Cp = 26.16 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.08Fe'"0.18Al0.10Ti0.86O3
G = -7062.35 (J) H = -5577.20 (J) S = 1.35 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.38 | 8.91 | 74.45 | 3.30 | 4.96 |

Total solids mass = 77.31 (gm) density = 2.69 (gm/cc)

G = -1219446.60 (J)  H = -1039438.73 (J)  S = 163.18 (J/K)  V = 28.69 (cc)  Cp = 91.51 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.61 (gm/cc)
G = -1585249.20 (J)  H = -1341205.09 (J)  S = 221.22 (J/K)  V = 38.26 (cc)  Cp = 122.03 (J/K)

Oxygen  delta moles = -0.00142963  delta grams = -0.0457464
G = 351.93 (J)  H = -37.62 (J)  S = -0.35 (J/K)  V = -131.12 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 820.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = 0.02  COH = 1.37  IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 21.52 (gm)  density = 2.36 (gm/cc)  viscosity = 5.70 (log 10 poise)  (analysis in wt %)
G = -347513.13 (J)  H = -287147.11 (J)  S = 55.22 (J/K)  V = 9.12 (cc)  Cp = 29.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.21 | 0.36 | 13.74 | 0.28 | 0.00 | 0.91 | 0.32 | 0.14 | 0.00 | 0.00 | 2.02 | 2.79 | 4.92 | 0.65 | 4.66 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.59 (gm)  density = 3.61 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.79Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -121203.23 (J)  H = -100533.37 (J)  S = 18.91 (J/K)  V = 2.66 (cc)  Cp = 10.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.97 | 97.68 | 110.26 | 5.51 | -5.33 | 7.62 | 0.24 |

feldspar  mass = 45.32 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.70Ca0.23Al1.23Si2.77O8
G = -735781.83 (J)  H = -628651.11 (J)  S = 98.00 (J/K)  V = 17.37 (cc)  Cp = 54.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.63 | 22.78 | 7.59 |

quartz  mass = 22.77 (gm)  density = 2.55 (gm/cc)
SiO2
G = -371287.12 (J)  H = -320556.67 (J)  S = 46.41 (J/K)  V = 8.92 (cc)  Cp = 26.59 (J/K)

rhm-oxide  mass = 0.75 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.17Al0.10Ti0.86O3
G = -7243.99 (J)  H = -5738.70 (J)  S = 1.38 (J/K)  V = 0.16 (cc)  Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.27 | 8.74 | 74.75 | 3.37 | 4.87 |

Total solids  mass = 78.43 (gm)  density = 2.69 (gm/cc)
G = -1235516.18 (J)  H = -1055479.85 (J)  S = 164.69 (J/K)  V = 29.11 (cc)  Cp = 92.78 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.61 (gm/cc)
G = -1583029.30 (J)  H = -1342626.96 (J)  S = 219.92 (J/K)  V = 38.23 (cc)  Cp = 121.83 (J/K)

Oxygen delta moles = -0.00145657 delta grams = -0.0466086
G = 354.96 (J) H = -37.82 (J) S = -0.36 (J/K) V = -132.38 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 20.40 (gm) density = 2.35 (gm/cc) viscosity = 5.63 (log 10 poise) (analysis in wt %)
G = -329291.30 (J) H = -272492.27 (J) S = 52.44 (J/K) V = 8.66 (cc) Cp = 27.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.00 | 0.33 | 13.68 | 0.26 | 0.00 | 0.84 | 0.33 | 0.13 | 0.00 | 0.00 | 2.03 | 2.78 | 5.02 | 0.68 | 4.92 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.45 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.64Mg0.21)3Al2Si3O12
G = -5921.18 (J) H = -4998.30 (J) S = 0.85 (J/K) V = 0.11 (cc) Cp = 0.48 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.95 | 14.97 | 21.08 |

orthopyroxene mass = 9.33 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.10Mg0.80Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -117870.43 (J) H = -98050.83 (J) S = 18.30 (J/K) V = 2.59 (cc) Cp = 10.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.17 | 97.67 | 109.72 | 5.40 | -5.23 | 7.38 | 0.24 |

feldspar mass = 45.78 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -742152.20 (J) H = -635457.78 (J) S = 98.50 (J/K) V = 17.55 (cc) Cp = 55.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.55 | 22.50 | 7.95 |

quartz mass = 23.22 (gm) density = 2.55 (gm/cc)
SiO2
G = -378097.14 (J) H = -327114.59 (J) S = 47.07 (J/K) V = 9.09 (cc) Cp = 27.08 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.75Mg0.08Fe'"0.17Al0.09Ti0.87O3
G = -7399.06 (J) H = -5880.79 (J) S = 1.40 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.29 | 8.49 | 75.01 | 3.46 | 4.74 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -83.13 (J) H = -70.49 (J) S = 0.01 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 79.55 (gm) density = 2.70 (gm/cc)
G = -1251523.14 (J) H = -1071572.78 (J) S = 166.14 (J/K) V = 29.51 (cc) Cp = 94.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1580814.44 (J) H = -1344065.05 (J) S = 218.57 (J/K) V = 38.17 (cc) Cp = 121.61 (J/K)

Oxygen delta moles = -0.00149905 delta grams = -0.0479677
G = 361.62 (J) H = -38.39 (J) S = -0.37 (J/K) V = -135.00 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 19.28 (gm) density = 2.35 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -310960.63 (J) H = -257652.53 (J) S = 49.67 (J/K) V = 8.21 (cc) Cp = 26.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.83 | 0.31 | 13.50 | 0.24 | 0.00 | 0.76 | 0.35 | 0.13 | 0.00 | 0.00 | 2.05 | 2.83 | 5.09 | 0.71 | 5.20 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.40 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.63Mg0.21)3Al2Si3O12
G = -18547.66 (J) H = -15698.69 (J) S = 2.65 (J/K) V = 0.35 (cc) Cp = 1.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.38 | 15.55 | 21.07 |

orthopyroxene mass = 8.71 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.08Mg0.82Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -110428.90 (J) H = -92161.71 (J) S = 17.02 (J/K) V = 2.42 (cc) Cp = 9.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.97 | 97.60 | 108.08 | 5.13 | -4.97 | 6.90 | 0.24 |

feldspar mass = 46.03 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.70Ca0.22Al1.22Si2.78O8
G = -744988.42 (J) H = -639236.72 (J) S = 98.54 (J/K) V = 17.65 (cc) Cp = 55.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.58 | 21.98 | 8.43 |

quartz mass = 23.73 (gm) density = 2.55 (gm/cc)
SiO2
G = -385993.22 (J) H = -334637.71 (J) S = 47.85 (J/K) V = 9.29 (cc) Cp = 27.65 (J/K)

rhm-oxide mass = 0.78 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.08Fe'''0.16Al0.09Ti0.87O3
G = -7529.15 (J) H = -6004.79 (J) S = 1.42 (J/K) V = 0.17 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.48 | 8.17 | 75.21 | 3.59 | 4.56 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -157.33 (J) H = -133.72 (J) S = 0.02 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 80.67 (gm) density = 2.70 (gm/cc)
G = -1267644.68 (J) H = -1087873.34 (J) S = 167.52 (J/K) V = 29.88 (cc) Cp = 95.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1578605.31 (J) H = -1345525.87 (J) S = 217.19 (J/K) V = 38.09 (cc) Cp = 121.38 (J/K)

Oxygen delta moles = -0.0015568 delta grams = -0.0498158
G = 371.72 (J) H = -39.32 (J) S = -0.38 (J/K) V = -138.91 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 18.18 (gm) density = 2.34 (gm/cc) viscosity = 5.40 (log 10 poise) (analysis in wt %)
G = -293096.02 (J) H = -243135.66 (J) S = 46.99 (J/K) V = 7.76 (cc) Cp = 24.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.60 | 0.28 | 13.32 | 0.23 | 0.00 | 0.69 | 0.36 | 0.13 | 0.00 | 0.00 | 2.09 | 2.89 | 5.15 | 0.74 | 5.52 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.31 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.63Mg0.21)3Al2Si3O12
G = -30571.75 (J) H = -25945.07 (J) S = 4.35 (J/K) V = 0.58 (cc) Cp = 2.46 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.77 | 16.15 | 21.07 |

orthopyroxene mass = 8.14 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.06Mg0.84Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -103436.37 (J) H = -86609.94 (J) S = 15.83 (J/K) V = 2.26 (cc) Cp = 9.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.66 | 97.52 | 106.31 | 4.86 | -4.71 | 6.45 | 0.24 |

feldspar mass = 46.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -747785.25 (J) H = -642990.91 (J) S = 98.57 (J/K) V = 17.75 (cc) Cp = 56.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.60 | 21.46 | 8.95 |

quartz mass = 24.23 (gm) density = 2.55 (gm/cc)
SiO2
G = -393677.59 (J) H = -342004.36 (J) S = 48.60 (J/K) V = 9.49 (cc) Cp = 28.20 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.09Fe'"0.16Al0.09Ti0.88O3
G = -7642.78 (J) H = -6116.43 (J) S = 1.44 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.68 | 7.84 | 75.39 | 3.71 | 4.38 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -203.35 (J) H = -173.24 (J) S = 0.03 (J/K) V = 0.00 (cc) Cp = 0.02 (J/K)

Total solids mass = 81.77 (gm) density = 2.70 (gm/cc)
G = -1283317.09 (J) H = -1103839.94 (J) S = 168.82 (J/K) V = 30.26 (cc) Cp = 96.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1576413.11 (J) H = -1346975.60 (J) S = 215.81 (J/K) V = 38.02 (cc) Cp = 121.18 (J/K)

Oxygen delta moles = -0.00160871 delta grams = -0.0514769
G = 380.16 (J) H = -40.07 (J) S = -0.40 (J/K) V = -142.20 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 780.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.02 COH = 1.24 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 16.86 (gm) density = 2.33 (gm/cc) viscosity = 5.22 (log 10 poise) (analysis in wt %)
G = -271853.46 (J) H = -225662.54 (J) S = 43.86 (J/K) V = 7.23 (cc) Cp = 22.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.27 | 0.26 | 13.12 | 0.22 | 0.00 | 0.64 | 0.39 | 0.13 | 0.00 | 0.00 | 2.14 | 3.03 | 5.07 | 0.79 | 5.95 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.22 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.62Mg0.21)3Al2Si3O12
G = -42664.40 (J) H = -36304.30 (J) S = 6.04 (J/K) V = 0.81 (cc) Cp = 3.44 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.13 | 16.69 | 21.17 |

orthopyroxene mass = 7.56 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.04Mg0.87Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -96442.59 (J) H = -81024.52 (J) S = 14.64 (J/K) V = 2.11 (cc) Cp = 8.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.13 | 97.44 | 104.29 | 4.61 | -4.48 | 6.02 | 0.24 |

feldspar mass = 46.05 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -742974.28 (J) H = -640227.41 (J) S = 97.56 (J/K) V = 17.66 (cc) Cp = 55.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.82 | 21.11 | 9.07 |

feldspar mass = 0.63 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.02Al1.02Si2.98O8
G = -9847.75 (J) H = -8467.20 (J) S = 1.31 (J/K) V = 0.25 (cc) Cp = 0.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.31 | 1.78 | 67.91 |

quartz mass = 24.80 (gm) density = 2.55 (gm/cc)
SiO2
G = -402431.01 (J) H = -350328.24 (J) S = 49.47 (J/K) V = 9.71 (cc) Cp = 28.83 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.09Fe'"0.15Al0.08Ti0.88O3
G = -7768.63 (J) H = -6238.88 (J) S = 1.45 (J/K) V = 0.17 (cc) Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.93 | 7.50 | 75.53 | 3.81 | 4.23 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -255.24 (J) H = -217.94 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 83.09 (gm) density = 2.71 (gm/cc)
G = -1302383.91 (J) H = -1122808.49 (J) S = 170.51 (J/K) V = 30.72 (cc) Cp = 98.06 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1574237.37 (J) H = -1348471.03 (J) S = 214.37 (J/K) V = 37.94 (cc) Cp = 120.99 (J/K)

Oxygen delta moles = -0.00165592 delta grams = -0.0529874
G = 387.25 (J) H = -40.67 (J) S = -0.41 (J/K) V = -145.00 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 15.33 (gm) density = 2.32 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -247356.75 (J) H = -205321.13 (J) S = 40.30 (J/K) V = 6.60 (cc) Cp = 20.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.78 | 0.22 | 12.89 | 0.21 | 0.00 | 0.60 | 0.42 | 0.13 | 0.00 | 0.00 | 2.23 | 3.26 | 4.86 | 0.86 | 6.54 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.12 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.61Mg0.21)3Al2Si3O12
G = -54590.15 (J) H = -46575.38 (J) S = 7.68 (J/K) V = 1.04 (cc) Cp = 4.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.48 | 17.15 | 21.37 |

orthopyroxene mass = 6.99 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.02Mg0.89Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -89568.89 (J) H = -75504.95 (J) S = 13.48 (J/K) V = 1.95 (cc) Cp = 7.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.44 | 97.38 | 102.06 | 4.39 | -4.26 | 5.62 | 0.24 |

feldspar mass = 45.34 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -730679.03 (J) H = -631013.18 (J) S = 95.54 (J/K) V = 17.38 (cc) Cp = 55.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.29 | 20.97 | 8.73 |

feldspar mass = 1.88 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.02Al1.02Si2.98O8
G = -29362.96 (J) H = -25302.80 (J) S = 3.89 (J/K) V = 0.74 (cc) Cp = 2.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.69 | 1.65 | 68.66 |

quartz mass = 25.44 (gm) density = 2.55 (gm/cc)
SiO2
G = -412320.05 (J) H = -359673.06 (J) S = 50.47 (J/K) V = 9.96 (cc) Cp = 29.54 (J/K)

rhm-oxide mass = 0.82 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.09Fe'"0.14Al0.08Ti0.89O3
G = -7900.41 (J) H = -6367.15 (J) S = 1.47 (J/K) V = 0.18 (cc) Cp = 0.75 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.21 | 7.15 | 75.65 | 3.88 | 4.11 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -300.70 (J) H = -257.34 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 84.61 (gm) density = 2.71 (gm/cc)
G = -1324722.19 (J) H = -1144693.85 (J) S = 172.58 (J/K) V = 31.26 (cc) Cp = 99.87 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1572078.94 (J) H = -1350014.98 (J) S = 212.88 (J/K) V = 37.86 (cc) Cp = 120.82 (J/K)

Oxygen delta moles = -0.00169836 delta grams = -0.0543454
G = 393.01 (J) H = -41.11 (J) S = -0.42 (J/K) V = -147.30 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 13.84 (gm) density = 2.31 (gm/cc) viscosity = 4.64 (log 10 poise) (analysis in wt %)
G = -223462.51 (J) H = -185402.94 (J) S = 36.84 (J/K) V = 6.00 (cc) Cp = 19.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.10 | 0.19 | 12.65 | 0.20 | 0.00 | 0.57 | 0.47 | 0.13 | 0.00 | 0.00 | 2.33 | 3.54 | 4.61 | 0.95 | 7.25 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.95 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.22)3Al2Si3O12
G = -65718.72 (J) H = -56217.71 (J) S = 9.20 (J/K) V = 1.25 (cc) Cp = 5.28 (J/K)

almandine grossular pyrope
60.83 17.58 21.59

orthopyroxene mass = 6.47 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.00Mg0.92Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -83229.76 (J) H = -70397.58 (J) S = 12.42 (J/K) V = 1.81 (cc) Cp = 7.27 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.72 97.32 99.78 4.17 -4.05 5.25 0.25

feldspar mass = 44.70 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -719526.36 (J) H = -622740.96 (J) S = 93.68 (J/K) V = 17.13 (cc) Cp = 54.51 (J/K)
albite anorthite sanidine
70.77 20.82 8.40

feldspar mass = 3.05 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -47554.00 (J) H = -41069.52 (J) S = 6.28 (J/K) V = 1.20 (cc) Cp = 3.61 (J/K)
albite anorthite sanidine
29.07 1.53 69.41

quartz mass = 26.08 (gm) density = 2.55 (gm/cc)
SiO2
G = -422145.48 (J) H = -368996.53 (J) S = 51.44 (J/K) V = 10.21 (cc) Cp = 30.24 (J/K)

rhm-oxide mass = 0.83 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.09Fe'"0.14Al0.08Ti0.89O3
G = -8009.35 (J) H = -6477.70 (J) S = 1.48 (J/K) V = 0.18 (cc) Cp = 0.76 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.50 6.81 75.77 3.94 3.99

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -291.80 (J) H = -250.30 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 86.11 (gm) density = 2.71 (gm/cc)
G = -1346475.48 (J) H = -1166150.28 (J) S = 174.54 (J/K) V = 31.79 (cc) Cp = 101.69 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1569937.99 (J) H = -1351553.23 (J) S = 211.38 (J/K) V = 37.79 (cc) Cp = 120.71 (J/K)

Oxygen delta moles = -0.00173603 delta grams = -0.0555508
G = 397.47 (J) H = -41.42 (J) S = -0.42 (J/K) V = -149.12 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 11.30 (gm) density = 2.29 (gm/cc) viscosity = 4.12 (log 10 poise) (analysis in wt %)
G = -182594.12 (J) H = -151125.88 (J) S = 30.76 (J/K) V = 4.94 (cc) Cp = 15.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.19 | 0.15 | 11.85 | 0.24 | 0.00 | 0.64 | 0.57 | 0.12 | 0.00 | 0.00 | 2.48 | 4.27 | 4.12 | 1.09 | 8.30 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.93 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -104536.25 (J) H = -89587.29 (J) S = 14.61 (J/K) V = 2.00 (cc) Cp = 8.42 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.27 | 17.99 | 19.74 |

orthopyroxene mass = 3.21 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.87Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -40707.63 (J) H = -34462.28 (J) S = 6.10 (J/K) V = 0.89 (cc) Cp = 3.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.60 | 97.47 | 104.62 | 4.00 | -3.89 | 5.16 | 0.24 |

clinopyroxene mass = 0.27 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.37Mg0.55Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -3851.11 (J) H = -3329.10 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.88 | 8.36 | 37.09 | 7.89 | 0.45 | 4.22 | 8.12 |

biotite mass = 1.52 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -23756.81 (J) H = -20427.61 (J) S = 3.25 (J/K) V = 0.55 (cc) Cp = 1.90 (J/K)

| annite | phlogopite |
|---|---|
| 7.27 | 92.73 |

feldspar mass = 43.69 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -702223.46 (J) H = -608992.13 (J) S = 91.12 (J/K) V = 16.76 (cc) Cp = 53.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.37 | 19.10 | 8.53 |

feldspar mass = 3.13 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -48740.27 (J) H = -42185.67 (J) S = 6.41 (J/K) V = 1.23 (cc) Cp = 3.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.50 | 1.38 | 69.12 |

quartz mass = 28.01 (gm) density = 2.55 (gm/cc)
SiO2
G = -452731.94 (J) H = -396538.02 (J) S = 54.92 (J/K) V = 10.97 (cc) Cp = 32.43 (J/K)

rhm-oxide mass = 0.85 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.09Fe'"0.14Al0.07Ti0.89O3
G = -8103.62 (J) H = -6565.56 (J) S = 1.50 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.60 | 7.10 | 76.63 | 4.00 | 3.66 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -580.28 (J)  H = -498.87 (J)  S = 0.08 (J/K)  V = 0.01 (cc)  Cp = 0.04 (J/K)

Total solids  mass = 88.64 (gm)  density = 2.71 (gm/cc)
G = -1385231.37 (J)  H = -1202586.54 (J)  S = 178.51 (J/K)  V = 32.67 (cc)  Cp = 104.73 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.66 (gm/cc)
G = -1567825.50 (J)  H = -1353712.42 (J)  S = 209.27 (J/K)  V = 37.61 (cc)  Cp = 120.41 (J/K)

Oxygen  delta moles = -0.00175404  delta grams = -0.0561271
G = 397.31 (J)  H = -41.23 (J)  S = -0.43 (J/K)  V = -149.21 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 740.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = -0.06  COH = 1.10
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 9.13 (gm)  density = 2.26 (gm/cc)  viscosity = 3.51 (log 10 poise)  (analysis in wt %)
G = -147717.26 (J)  H = -121803.93 (J)  S = 25.58 (J/K)  V = 4.04 (cc)  Cp = 12.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.62 | 0.11 | 11.08 | 0.28 | 0.00 | 0.71 | 0.70 | 0.10 | 0.00 | 0.00 | 2.70 | 5.11 | 3.57 | 1.32 | 9.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.41 (gm)  density = 3.98 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.64Mg0.18)3Al2Si3O12
G = -136385.13 (J)  H = -117094.53 (J)  S = 19.04 (J/K)  V = 2.61 (cc)  Cp = 11.01 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.70 | 18.03 | 18.27 |

orthopyroxene  mass = 0.45 (gm)  density = 3.61 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.83Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -5645.06 (J)  H = -4784.22 (J)  S = 0.85 (J/K)  V = 0.12 (cc)  Cp = 0.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.02 | 97.64 | 108.94 | 3.87 | -3.77 | 5.10 | 0.24 |

clinopyroxene  mass = 0.60 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.40Mg0.52Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -8585.44 (J)  H = -7431.69 (J)  S = 1.14 (J/K)  V = 0.18 (cc)  Cp = 0.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.58 | 8.35 | 39.52 | 6.97 | 0.93 | 4.05 | 8.61 |

biotite  mass = 2.76 (gm)  density = 2.80 (gm/cc)  (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -42691.89 (J)  H = -36759.27 (J)  S = 5.86 (J/K)  V = 0.99 (cc)  Cp = 3.43 (J/K)

| annite | phlogopite |
|---|---|
| 9.22 | 90.78 |

feldspar  mass = 42.84 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.09Na0.74Ca0.17Al1.17Si2.83O8
G = -687566.31 (J) H = -597492.21 (J) S = 88.91 (J/K) V = 16.45 (cc) Cp = 52.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.90 | 17.45 | 8.65 |

feldspar mass = 3.20 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -49742.74 (J) H = -43146.99 (J) S = 6.51 (J/K) V = 1.26 (cc) Cp = 3.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.88 | 1.24 | 68.88 |

quartz mass = 29.64 (gm) density = 2.55 (gm/cc)
SiO2
G = -478595.82 (J) H = -420042.30 (J) S = 57.79 (J/K) V = 11.61 (cc) Cp = 34.28 (J/K)

rhm-oxide mass = 0.86 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.08Fe'"0.15Al0.07Ti0.89O3
G = -8119.23 (J) H = -6591.58 (J) S = 1.51 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.85 | 7.33 | 77.40 | 4.02 | 3.40 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -686.77 (J) H = -591.75 (J) S = 0.09 (J/K) V = 0.02 (cc) Cp = 0.05 (J/K)

Total solids mass = 90.81 (gm) density = 2.72 (gm/cc)
G = -1418018.39 (J) H = -1233934.53 (J) S = 181.69 (J/K) V = 33.42 (cc) Cp = 107.48 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1565735.66 (J) H = -1355738.46 (J) S = 207.27 (J/K) V = 37.45 (cc) Cp = 120.31 (J/K)

Oxygen delta moles = -0.00176787 delta grams = -0.0565698
G = 396.12 (J) H = -40.94 (J) S = -0.43 (J/K) V = -148.92 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 730.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.07 COH = 1.06 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 7.45 (gm) density = 2.23 (gm/cc) viscosity = 2.80 (log 10 poise) (analysis in wt %)
G = -120852.23 (J) H = -99119.29 (J) S = 21.66 (J/K) V = 3.34 (cc) Cp = 10.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.87 | 0.08 | 10.62 | 0.30 | 0.00 | 0.75 | 0.86 | 0.09 | 0.00 | 0.00 | 3.15 | 5.83 | 3.05 | 1.71 | 11.68 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.83 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.64Mg0.17)3Al2Si3O12
G = -141459.77 (J) H = -121724.73 (J) S = 19.67 (J/K) V = 2.72 (cc) Cp = 11.42 (J/K)

almandine grossular pyrope
64.11 18.69 17.20

clinopyroxene mass = 0.51 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.84Fe"0.40Mg0.51Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -7213.45 (J) H = -6257.35 (J) S = 0.95 (J/K) V = 0.15 (cc) Cp = 0.55 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
31.35 7.50 39.81 7.41 1.24 3.83 8.87

biotite mass = 3.14 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.10Mg0.90)3AlSi3O10(OH)2
G = -48394.00 (J) H = -41745.48 (J) S = 6.63 (J/K) V = 1.12 (cc) Cp = 3.90 (J/K)
annite phlogopite
10.21 89.79

feldspar mass = 42.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.17Al1.17Si2.83O8
G = -685170.86 (J) H = -596720.03 (J) S = 88.17 (J/K) V = 16.40 (cc) Cp = 53.38 (J/K)
albite anorthite sanidine
74.34 17.37 8.28

feldspar mass = 3.88 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -60183.51 (J) H = -52318.87 (J) S = 7.84 (J/K) V = 1.53 (cc) Cp = 4.61 (J/K)
albite anorthite sanidine
29.12 1.14 69.73

quartz mass = 30.50 (gm) density = 2.55 (gm/cc)
SiO2
G = -491781.86 (J) H = -432487.81 (J) S = 59.11 (J/K) V = 11.94 (cc) Cp = 35.22 (J/K)

rhm-oxide mass = 0.87 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.78Mg0.07Fe'"0.14Al0.07Ti0.90O3
G = -8160.10 (J) H = -6643.94 (J) S = 1.51 (J/K) V = 0.19 (cc) Cp = 0.78 (J/K)
geikielite hematite ilmenite pyrophanite corundum
7.42 7.10 78.27 3.90 3.30

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -442.76 (J) H = -382.36 (J) S = 0.06 (J/K) V = 0.01 (cc) Cp = 0.03 (J/K)

Total solids mass = 92.49 (gm) density = 2.72 (gm/cc)
G = -1442806.31 (J) H = -1258280.56 (J) S = 183.95 (J/K) V = 34.05 (cc) Cp = 109.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1563658.54 (J) H = -1357399.85 (J) S = 205.61 (J/K) V = 37.40 (cc) Cp = 120.58 (J/K)

Oxygen delta moles = -0.00179275 delta grams = -0.0573657
G = 397.33 (J) H = -40.89 (J) S = -0.44 (J/K) V = -149.52 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.20 (log 10 poise)  (analysis in wt %)
G = -1701642.87 (J)  H = -1258174.10 (J)  S = 281.90 (J/K)  V = 40.77 (cc)  Cp = 143.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.20 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1701642.87 (J)  H = -1258174.10 (J)  S = 281.90 (J/K)  V = 40.77 (cc)  Cp = 143.08 (J/K)

Oxygen  delta moles = 1.04083e-16  delta grams = 3.33054e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.45 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -1698829.59 (J)  H = -1259605.79 (J)  S = 280.99 (J/K)  V = 40.74 (cc)  Cp = 143.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.45 (gm/cc)
G = -1698829.59 (J)  H = -1259605.79 (J)  S = 280.99 (J/K)  V = 40.74 (cc)  Cp = 143.07 (J/K)

Oxygen  delta moles = 2.12164e-06  delta grams = 6.78898e-05
G = -0.77 (J)  H = 0.09 (J)  S = 0.00 (J/K)  V = 0.28 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1696025.60 (J)  H = -1261037.52 (J)  S = 280.07 (J/K)  V = 40.71 (cc)  Cp = 143.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1696025.60 (J)  H = -1261037.52 (J)  S = 280.07 (J/K)  V = 40.71 (cc)  Cp = 143.06 (J/K)

Oxygen  delta moles = 4.51158e-06  delta grams = 0.000144365
G = -1.63 (J)  H = 0.19 (J)  S = 0.00 (J/K)  V = 0.58 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1693230.98 (J)  H = -1262469.29 (J)  S = 279.14 (J/K)  V = 40.68 (cc)  Cp = 143.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1693230.98 (J)  H = -1262469.29 (J)  S = 279.14 (J/K)  V = 40.68 (cc)  Cp = 143.05 (J/K)

Oxygen  delta moles = 7.17736e-06  delta grams = 0.000229667
G = -2.57 (J)  H = 0.30 (J)  S = 0.00 (J/K)  V = 0.92 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.43 (log 10 poise)  (analysis in wt %)
G = -1690445.77 (J)  H = -1263901.12 (J)  S = 278.21 (J/K)  V = 40.65 (cc)  Cp = 143.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1690445.77 (J)  H = -1263901.12 (J)  S = 278.21 (J/K)  V = 40.65 (cc)  Cp = 143.04 (J/K)

Oxygen  delta moles = 1.01268e-05  delta grams = 0.000324045
G = -3.60 (J)  H = 0.42 (J)  S = 0.00 (J/K)  V = 1.29 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.46 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1687670.04 (J)  H = -1265333.01 (J)  S = 277.28 (J/K)  V = 40.62 (cc)  Cp = 143.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.46 (gm/cc)
G = -1687670.04 (J)  H = -1265333.01 (J)  S = 277.28 (J/K)  V = 40.62 (cc)  Cp = 143.04 (J/K)

Oxygen  delta moles = 1.3368e-05  delta grams = 0.000427761
G = -4.71 (J)  H = 0.55 (J)  S = 0.00 (J/K)  V = 1.69 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1240.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.24  COH = 2.19  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.46 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -1684903.87 (J) H = -1266764.96 (J) S = 276.34 (J/K) V = 40.59 (cc) Cp = 143.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System mass = 100.00 (gm) density = 2.46 (gm/cc)
G = -1684903.87 (J) H = -1266764.96 (J) S = 276.34 (J/K) V = 40.59 (cc) Cp = 143.03 (J/K)

Oxygen delta moles = 1.69096e-05 delta grams = 0.000541087
G = -5.92 (J) H = 0.69 (J) S = 0.00 (J/K) V = 2.13 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1682147.31 (J) H = -1268196.99 (J) S = 275.39 (J/K) V = 40.56 (cc) Cp = 143.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.65 | 0.00 | 3.28 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1682147.31 (J) H = -1268196.99 (J) S = 275.39 (J/K) V = 40.56 (cc) Cp = 143.02 (J/K)

Oxygen delta moles = 2.07603e-05 delta grams = 0.000664306
G = -7.21 (J) H = 0.84 (J) S = 0.01 (J/K) V = 2.59 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1679400.43 (J) H = -1269629.09 (J) S = 274.43 (J/K) V = 40.53 (cc) Cp = 143.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.66 | 0.00 | 3.27 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1679400.43 (J) H = -1269629.09 (J) S = 274.43 (J/K) V = 40.53 (cc) Cp = 143.01 (J/K)

Oxygen delta moles = 2.49295e-05 delta grams = 0.000797715
G = -8.59 (J) H = 1.01 (J) S = 0.01 (J/K) V = 3.09 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1676663.30 (J) H = -1271061.27 (J) S = 273.47 (J/K) V = 40.50 (cc) Cp = 143.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.66 | 0.00 | 3.27 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1676663.30 (J) H = -1271061.27 (J) S = 273.47 (J/K) V = 40.50 (cc) Cp = 143.00 (J/K)

Oxygen delta moles = 2.94268e-05 delta grams = 0.000941623
G = -10.07 (J) H = 1.18 (J) S = 0.01 (J/K) V = 3.63 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1200.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.12 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1673935.87 (J) H = -1272439.60 (J) S = 272.54 (J/K) V = 40.47 (cc) Cp = 135.11 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.66 0.00 3.27 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1673935.87 (J) H = -1272439.60 (J) S = 272.54 (J/K) V = 40.47 (cc) Cp = 135.11 (J/K)

Oxygen delta moles = 3.42623e-05 delta grams = 0.00109635
G = -11.63 (J) H = 1.36 (J) S = 0.01 (J/K) V = 4.20 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1671217.81 (J) H = -1273793.05 (J) S = 271.62 (J/K) V = 40.44 (cc) Cp = 135.09 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.66 0.00 3.27 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1671217.81 (J) H = -1273793.05 (J) S = 271.62 (J/K) V = 40.44 (cc) Cp = 135.09 (J/K)

Oxygen delta moles = 3.94465e-05 delta grams = 0.00126224
G = -13.29 (J) H = 1.55 (J) S = 0.01 (J/K) V = 4.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.47 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1668509.18 (J) H = -1275146.41 (J) S = 270.70 (J/K) V = 40.41 (cc) Cp = 135.06 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.66 0.00 3.27 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.47 (gm/cc)
G = -1668509.18 (J) H = -1275146.41 (J) S = 270.70 (J/K) V = 40.41 (cc) Cp = 135.06 (J/K)

Oxygen delta moles = 4.49905e-05 delta grams = 0.00143964
G = -15.05 (J) H = 1.75 (J) S = 0.01 (J/K) V = 5.44 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1665810.03 (J) H = -1276499.67 (J) S = 269.76 (J/K) V = 40.38 (cc) Cp = 135.03 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.66 0.00 3.27 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1665810.03 (J) H = -1276499.67 (J) S = 269.76 (J/K) V = 40.38 (cc) Cp = 135.03 (J/K)

Oxygen delta moles = 5.09057e-05 delta grams = 0.00162892
G = -16.89 (J) H = 1.96 (J) S = 0.01 (J/K) V = 6.11 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1160.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.05 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1663120.44 (J) H = -1277852.83 (J) S = 268.83 (J/K) V = 40.36 (cc) Cp = 135.00 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

70.61 0.43 13.88 0.67 0.00 3.27 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1663120.44 (J) H = -1277852.83 (J) S = 268.83 (J/K) V = 40.36 (cc) Cp = 135.00 (J/K)

Oxygen delta moles = 5.72041e-05 delta grams = 0.00183046
G = -18.84 (J) H = 2.18 (J) S = 0.01 (J/K) V = 6.82 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1150.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.03 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1660440.48 (J) H = -1279205.87 (J) S = 267.88 (J/K) V = 40.33 (cc) Cp = 134.97 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.67 0.00 3.26 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1660440.48 (J) H = -1279205.87 (J) S = 267.88 (J/K) V = 40.33 (cc) Cp = 134.97 (J/K)

Oxygen delta moles = 6.38984e-05 delta grams = 0.00204467
G = -20.88 (J) H = 2.41 (J) S = 0.02 (J/K) V = 7.56 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1140.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.18 COH = 2.01 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1657770.21 (J) H = -1280558.80 (J) S = 266.93 (J/K) V = 40.30 (cc) Cp = 134.94 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.67 0.00 3.26 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1657770.21 (J) H = -1280558.80 (J) S = 266.93 (J/K) V = 40.30 (cc) Cp = 134.94 (J/K)

Oxygen delta moles = 7.10017e-05 delta grams = 0.00227197
G = -23.02 (J) H = 2.66 (J) S = 0.02 (J/K) V = 8.34 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1130.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.17 COH = 1.99 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 99.73 (gm) density = 2.48 (gm/cc) viscosity = 5.32 (log 10 poise) (analysis in wt %)
G = -1651019.26 (J) H = -1278817.14 (J) S = 265.26 (J/K) V = 40.18 (cc) Cp = 134.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.66 | 0.43 | 13.91 | 0.67 | 0.00 | 3.22 | 0.08 | 1.28 | 0.00 | 0.00 | 2.65 | 4.28 | 1.67 | 0.14 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.27 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.34Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -4079.87 (J) H = -3190.22 (J) S = 0.63 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.24 | 96.36 | 56.55 | 3.95 | -3.76 | 5.78 | 0.36 |

Total solids mass = 0.27 (gm) density = 3.35 (gm/cc)
G = -4079.87 (J) H = -3190.22 (J) S = 0.63 (J/K) V = 0.08 (cc) Cp = 0.33 (J/K)

Viscosity of the System: 5.32 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1655099.12 (J) H = -1282007.36 (J) S = 265.90 (J/K) V = 40.26 (cc) Cp = 134.82 (J/K)

Oxygen delta moles = 5.875e-05 delta grams = 0.00187993
G = -18.89 (J) H = 2.18 (J) S = 0.02 (J/K) V = 6.85 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 99.31 (gm) density = 2.48 (gm/cc) viscosity = 5.42 (log 10 poise) (analysis in wt %)
G = -1642189.47 (J) H = -1275481.44 (J) S = 263.22 (J/K) V = 40.01 (cc) Cp = 133.82 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.73 0.43 13.96 0.66 0.00 3.16 0.08 1.19 0.00 0.00 2.66 4.29 1.68 0.14 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.69 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.59Mg1.31Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -10242.52 (J) H = -8021.80 (J) S = 1.59 (J/K) V = 0.20 (cc) Cp = 0.83 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-61.31 96.21 58.60 4.06 -3.88 5.93 0.38

Total solids mass = 0.69 (gm) density = 3.36 (gm/cc)
G = -10242.52 (J) H = -8021.80 (J) S = 1.59 (J/K) V = 0.20 (cc) Cp = 0.83 (J/K)

Viscosity of the System: 5.43 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1652431.98 (J) H = -1283503.24 (J) S = 264.82 (J/K) V = 40.21 (cc) Cp = 134.65 (J/K)

Oxygen delta moles = 3.41446e-05 delta grams = 0.00109259
G = -10.89 (J) H = 1.25 (J) S = 0.01 (J/K) V = 3.95 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1110.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.16 COH = 1.95 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 98.91 (gm) density = 2.48 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -1633565.61 (J) H = -1272277.94 (J) S = 261.21 (J/K) V = 39.84 (cc) Cp = 133.16 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.81 0.44 14.01 0.65 0.00 3.10 0.08 1.10 0.00 0.00 2.67 4.31 1.68 0.14 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 1.09 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.61Mg1.29Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -16209.02 (J) H = -12714.77 (J) S = 2.53 (J/K) V = 0.32 (cc) Cp = 1.32 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-63.42 96.06 60.70 4.18 -3.99 6.08 0.39

Total solids mass = 1.09 (gm) density = 3.37 (gm/cc)
G = -16209.02 (J) H = -12714.77 (J) S = 2.53 (J/K) V = 0.32 (cc) Cp = 1.32 (J/K)

Viscosity of the System: 5.53 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1649774.63 (J) H = -1284992.71 (J) S = 263.73 (J/K) V = 40.17 (cc) Cp = 134.49 (J/K)

Oxygen delta moles = 7.62814e-06 delta grams = 0.000244091
G = -2.41 (J) H = 0.28 (J) S = 0.00 (J/K) V = 0.88 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1100.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.93  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.51 (gm)  density = 2.48 (gm/cc)  viscosity = 5.62 (log 10 poise)  (analysis in wt %)
G = -1625132.76 (J)  H = -1269196.09 (J)  S = 259.21 (J/K)  V = 39.68 (cc)  Cp = 132.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.89 | 0.44 | 14.05 | 0.64 | 0.00 | 3.03 | 0.08 | 1.02 | 0.00 | 0.00 | 2.68 | 4.33 | 1.69 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.49 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.63Mg1.26Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -21994.30 (J)  H = -17280.11 (J)  S = 3.43 (J/K)  V = 0.44 (cc)  Cp = 1.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.59 | 95.91 | 62.84 | 4.31 | -4.12 | 6.24 | 0.41 |

Total solids  mass = 1.49 (gm)  density = 3.38 (gm/cc)
G = -21994.30 (J)  H = -17280.11 (J)  S = 3.43 (J/K)  V = 0.44 (cc)  Cp = 1.80 (J/K)

Viscosity of the System: 5.64 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1647127.06 (J)  H = -1286476.19 (J)  S = 262.64 (J/K)  V = 40.12 (cc)  Cp = 134.32 (J/K)

Oxygen  delta moles = -2.08951e-05  delta grams = -0.000668619
G = 6.56 (J)  H = -0.75 (J)  S = -0.01 (J/K)  V = -2.39 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1090.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.93  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.91  IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.11 (gm)  density = 2.48 (gm/cc)  viscosity = 5.72 (log 10 poise)  (analysis in wt %)
G = -1616877.66 (J)  H = -1266226.46 (J)  S = 257.24 (J/K)  V = 39.52 (cc)  Cp = 131.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.97 | 0.44 | 14.10 | 0.63 | 0.00 | 2.96 | 0.08 | 0.94 | 0.00 | 0.00 | 2.68 | 4.35 | 1.70 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.89 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.65Mg1.24Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -27611.60 (J)  H = -21727.59 (J)  S = 4.32 (J/K)  V = 0.56 (cc)  Cp = 2.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.79 | 95.76 | 65.01 | 4.45 | -4.26 | 6.41 | 0.42 |

Total solids  mass = 1.89 (gm)  density = 3.39 (gm/cc)

G = -27611.60 (J)  H = -21727.59 (J)  S = 4.32 (J/K)  V = 0.56 (cc)  Cp = 2.27 (J/K)

Viscosity of the System: 5.75 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1644489.27 (J)  H = -1287954.05 (J)  S = 261.55 (J/K)  V = 40.08 (cc)  Cp = 134.17 (J/K)

Oxygen  delta moles = -5.15077e-05  delta grams = -0.00164818
G = 16.04 (J)  H = -1.83 (J)  S = -0.01 (J/K)  V = -5.84 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1080.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.14  COH = 1.89  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.72 (gm)  density = 2.48 (gm/cc)  viscosity = 5.83 (log 10 poise)  (analysis in wt %)
G = -1608788.85 (J)  H = -1263360.81 (J)  S = 255.28 (J/K)  V = 39.36 (cc)  Cp = 131.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.05 | 0.44 | 14.14 | 0.62 | 0.00 | 2.88 | 0.08 | 0.87 | 0.00 | 0.00 | 2.69 | 4.36 | 1.70 | 0.14 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.28 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.67Mg1.21Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -33072.43 (J)  H = -26065.77 (J)  S = 5.18 (J/K)  V = 0.67 (cc)  Cp = 2.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.03 | 95.61 | 67.20 | 4.59 | -4.40 | 6.59 | 0.43 |

Total solids  mass = 2.28 (gm)  density = 3.40 (gm/cc)
G = -33072.43 (J)  H = -26065.77 (J)  S = 5.18 (J/K)  V = 0.67 (cc)  Cp = 2.73 (J/K)

Viscosity of the System: 5.85 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1641861.27 (J)  H = -1289426.58 (J)  S = 260.46 (J/K)  V = 40.03 (cc)  Cp = 134.01 (J/K)

Oxygen  delta moles = -8.42755e-05  delta grams = -0.00269671
G = 26.03 (J)  H = -2.97 (J)  S = -0.02 (J/K)  V = -9.48 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1070.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.13  COH = 1.87  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.68 (gm)  density = 2.48 (gm/cc)  viscosity = 5.92 (log 10 poise)  (analysis in wt %)
G = -1556650.88 (J)  H = -1225565.39 (J)  S = 246.50 (J/K)  V = 38.16 (cc)  Cp = 127.00 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

71.31 0.45 14.00 0.61 0.00 2.84 0.08 0.79 0.00 0.00 2.63 4.31 1.75 0.15 1.06 0.00 0.00 0.00 0.00

orthopyroxene mass = 2.81 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.70Mg1.18Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -40521.52 (J) H = -31974.26 (J) S = 6.36 (J/K) V = 0.82 (cc) Cp = 3.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.26 | 95.63 | 70.30 | 4.65 | -4.46 | 6.70 | 0.44 |

feldspar mass = 2.23 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.02Na0.70Ca0.28Al1.28Si2.72O8
G = -37578.08 (J) H = -30352.48 (J) S = 5.38 (J/K) V = 0.86 (cc) Cp = 2.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.18 | 27.55 | 2.26 |

quartz mass = 0.27 (gm) density = 2.56 (gm/cc)
SiO2
G = -4480.50 (J) H = -3663.68 (J) S = 0.61 (J/K) V = 0.10 (cc) Cp = 0.32 (J/K)

Total solids mass = 5.31 (gm) density = 2.98 (gm/cc)
G = -82580.10 (J) H = -65990.42 (J) S = 12.35 (J/K) V = 1.79 (cc) Cp = 6.41 (J/K)

Viscosity of the System: 6.00 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1639230.98 (J) H = -1291555.81 (J) S = 258.85 (J/K) V = 39.95 (cc) Cp = 133.41 (J/K)

Oxygen delta moles = -0.000144168 delta grams = -0.00461322
G = 44.16 (J) H = -5.03 (J) S = -0.04 (J/K) V = -16.10 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1060.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.84 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 86.73 (gm) density = 2.48 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -1422890.05 (J) H = -1122230.82 (J) S = 225.53 (J/K) V = 34.98 (cc) Cp = 116.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.19 | 0.50 | 13.95 | 0.63 | 0.00 | 2.90 | 0.09 | 0.72 | 0.00 | 0.00 | 2.56 | 4.26 | 1.89 | 0.16 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.55 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.74Mg1.14Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -50514.16 (J) H = -39890.53 (J) S = 7.97 (J/K) V = 1.03 (cc) Cp = 4.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.51 | 95.74 | 74.22 | 4.75 | -4.55 | 6.92 | 0.43 |

feldspar mass = 6.93 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.02Na0.70Ca0.27Al1.27Si2.73O8
G = -116439.00 (J) H = -94261.29 (J) S = 16.64 (J/K) V = 2.66 (cc) Cp = 8.48 (J/K)

albite anorthite sanidine
70.44 27.09 2.47

quartz mass = 2.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -46763.22 (J) H = -38323.09 (J) S = 6.33 (J/K) V = 1.09 (cc) Cp = 3.32 (J/K)

Total solids mass = 13.27 (gm) density = 2.77 (gm/cc)
G = -213716.38 (J) H = -172474.91 (J) S = 30.94 (J/K) V = 4.78 (cc) Cp = 16.01 (J/K)

Viscosity of the System: 6.16 (log 10 poise)

System mass = 99.99 (gm) density = 2.51 (gm/cc)
G = -1636606.44 (J) H = -1294705.73 (J) S = 256.46 (J/K) V = 39.77 (cc) Cp = 132.26 (J/K)

Oxygen delta moles = -0.000232698 delta grams = -0.00744607
G = 70.69 (J) H = -8.03 (J) S = -0.06 (J/K) V = -25.79 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1050.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.12 COH = 1.82 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 79.82 (gm) density = 2.48 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -1307118.64 (J) H = -1032788.87 (J) S = 207.33 (J/K) V = 32.23 (cc) Cp = 106.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.08 | 0.54 | 13.90 | 0.64 | 0.00 | 2.92 | 0.10 | 0.65 | 0.00 | 0.00 | 2.50 | 4.21 | 2.02 | 0.18 | 1.26 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.21 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.78Mg1.10Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -59341.92 (J) H = -46903.27 (J) S = 9.40 (J/K) V = 1.22 (cc) Cp = 4.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.61 | 95.85 | 77.97 | 4.86 | -4.64 | 7.14 | 0.43 |

feldspar mass = 11.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.27Al1.27Si2.73O8
G = -184622.71 (J) H = -149794.68 (J) S = 26.32 (J/K) V = 4.23 (cc) Cp = 13.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.65 | 26.67 | 2.68 |

quartz mass = 4.95 (gm) density = 2.56 (gm/cc)
SiO2
G = -82922.40 (J) H = -68106.93 (J) S = 11.20 (J/K) V = 1.93 (cc) Cp = 5.89 (J/K)

Total solids mass = 20.17 (gm) density = 2.73 (gm/cc)
G = -326887.03 (J) H = -264804.88 (J) S = 46.92 (J/K) V = 7.38 (cc) Cp = 24.32 (J/K)

Viscosity of the System: 6.32 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1634005.67 (J) H = -1297593.75 (J) S = 254.25 (J/K) V = 39.61 (cc) Cp = 131.26 (J/K)

Oxygen delta moles = -0.00031987 delta grams = -0.0102355
G = 96.36 (J) H = -10.93 (J) S = -0.08 (J/K) V = -35.19 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1040.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.11 COH = 1.80 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 73.77 (gm) density = 2.47 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -1205948.21 (J) H = -954617.50 (J) S = 191.40 (J/K) V = 29.81 (cc) Cp = 98.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.98 | 0.58 | 13.86 | 0.64 | 0.00 | 2.93 | 0.11 | 0.59 | 0.00 | 0.00 | 2.44 | 4.15 | 2.16 | 0.19 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.82 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.07Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -67217.69 (J) H = -53181.26 (J) S = 10.69 (J/K) V = 1.39 (cc) Cp = 5.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.51 | 95.97 | 81.53 | 4.97 | -4.74 | 7.35 | 0.42 |

feldspar mass = 14.58 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -244106.14 (J) H = -198503.49 (J) S = 34.73 (J/K) V = 5.60 (cc) Cp = 17.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.83 | 26.29 | 2.88 |

quartz mass = 6.82 (gm) density = 2.56 (gm/cc)
SiO2
G = -114155.08 (J) H = -93967.13 (J) S = 15.37 (J/K) V = 2.67 (cc) Cp = 8.12 (J/K)

Total solids mass = 26.22 (gm) density = 2.72 (gm/cc)
G = -425478.92 (J) H = -345651.88 (J) S = 60.79 (J/K) V = 9.65 (cc) Cp = 31.74 (J/K)

Viscosity of the System: 6.50 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1631427.12 (J) H = -1300269.37 (J) S = 252.19 (J/K) V = 39.46 (cc) Cp = 130.53 (J/K)

Oxygen delta moles = -0.000405548 delta grams = -0.012977
G = 121.14 (J) H = -13.71 (J) S = -0.10 (J/K) V = -44.28 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1030.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.10 COH = 1.78 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 68.42 (gm) density = 2.47 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -1116807.45 (J) H = -885726.69 (J) S = 177.32 (J/K) V = 27.68 (cc) Cp = 91.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.89 | 0.63 | 13.82 | 0.64 | 0.00 | 2.91 | 0.12 | 0.54 | 0.00 | 0.00 | 2.39 | 4.09 | 2.29 | 0.21 | 1.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.37 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.03Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -74291.04 (J) H = -58843.45 (J) S = 11.85 (J/K) V = 1.54 (cc) Cp = 6.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.18 | 96.09 | 84.87 | 5.07 | -4.83 | 7.55 | 0.42 |

feldspar mass = 17.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -296400.77 (J) H = -241573.75 (J) S = 42.07 (J/K) V = 6.81 (cc) Cp = 21.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.97 | 25.95 | 3.08 |

quartz mass = 8.46 (gm) density = 2.56 (gm/cc)
SiO2
G = -141370.38 (J) H = -116626.76 (J) S = 18.99 (J/K) V = 3.31 (cc) Cp = 10.06 (J/K)

Total solids mass = 31.57 (gm) density = 2.71 (gm/cc)
G = -512062.20 (J) H = -417043.96 (J) S = 72.91 (J/K) V = 11.66 (cc) Cp = 38.17 (J/K)

Viscosity of the System: 6.70 (log 10 poise)

System mass = 99.98 (gm) density = 2.54 (gm/cc)
G = -1628869.65 (J) H = -1302770.65 (J) S = 250.24 (J/K) V = 39.34 (cc) Cp = 129.76 (J/K)

Oxygen delta moles = -0.000489453 delta grams = -0.0156619
G = 144.96 (J) H = -16.37 (J) S = -0.12 (J/K) V = -53.03 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1020.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.10 COH = 1.76 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 63.66 (gm) density = 2.47 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -1037729.55 (J) H = -824594.76 (J) S = 164.82 (J/K) V = 25.78 (cc) Cp = 85.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.80 | 0.67 | 13.79 | 0.64 | 0.00 | 2.87 | 0.13 | 0.49 | 0.00 | 0.00 | 2.35 | 4.03 | 2.43 | 0.22 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.89 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.88Mg1.00Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -80667.55 (J) H = -63973.97 (J) S = 12.91 (J/K) V = 1.68 (cc) Cp = 6.85 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-92.60 96.21 87.98 5.18 -4.92 7.74 0.41

feldspar mass = 20.53 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -342667.97 (J) H = -279914.23 (J) S = 48.53 (J/K) V = 7.88 (cc) Cp = 25.25 (J/K)
albite anorthite sanidine
71.08 25.63 3.29

quartz mass = 9.90 (gm) density = 2.56 (gm/cc)
SiO2
G = -165267.28 (J) H = -136641.79 (J) S = 22.14 (J/K) V = 3.87 (cc) Cp = 11.77 (J/K)

Total solids mass = 36.32 (gm) density = 2.70 (gm/cc)
G = -588602.80 (J) H = -480529.99 (J) S = 83.57 (J/K) V = 13.44 (cc) Cp = 43.87 (J/K)

Viscosity of the System: 6.93 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1626332.34 (J) H = -1305124.75 (J) S = 248.39 (J/K) V = 39.22 (cc) Cp = 129.07 (J/K)

Oxygen delta moles = -0.000571225 delta grams = -0.0182785
G = 167.74 (J) H = -18.90 (J) S = -0.14 (J/K) V = -61.42 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1010.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.09 COH = 1.73 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 59.40 (gm) density = 2.47 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -967174.41 (J) H = -770030.62 (J) S = 153.64 (J/K) V = 24.09 (cc) Cp = 79.50 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.72 0.72 13.76 0.63 0.00 2.81 0.14 0.45 0.00 0.00 2.31 3.97 2.57 0.24 1.69 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.36 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.97Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -86424.02 (J) H = -68633.93 (J) S = 13.86 (J/K) V = 1.81 (cc) Cp = 7.37 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-95.74 96.32 90.84 5.27 -5.00 7.91 0.40

feldspar mass = 23.03 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.25Al1.25Si2.75O8
G = -383821.65 (J) H = -314240.28 (J) S = 54.23 (J/K) V = 8.84 (cc) Cp = 28.30 (J/K)
albite anorthite sanidine
71.17 25.34 3.49

quartz mass = 11.18 (gm) density = 2.56 (gm/cc)
SiO2
G = -186394.42 (J) H = -154448.70 (J) S = 24.90 (J/K) V = 4.37 (cc) Cp = 13.28 (J/K)

Total solids mass = 40.58 (gm) density = 2.70 (gm/cc)
G = -656640.09 (J) H = -537322.90 (J) S = 92.99 (J/K) V = 15.03 (cc) Cp = 48.95 (J/K)

Viscosity of the System: 7.19 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1623814.50 (J) H = -1307353.53 (J) S = 246.63 (J/K) V = 39.12 (cc) Cp = 128.44 (J/K)

Oxygen delta moles = -0.000650488 delta grams = -0.0208149
G = 189.37 (J) H = -21.29 (J) S = -0.16 (J/K) V = -69.40 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 55.57 (gm) density = 2.46 (gm/cc) viscosity = 5.93 (log 10 poise) (analysis in wt %)
G = -903908.61 (J) H = -721080.69 (J) S = 143.60 (J/K) V = 22.57 (cc) Cp = 74.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.64 | 0.77 | 13.73 | 0.62 | 0.00 | 2.74 | 0.14 | 0.41 | 0.00 | 0.00 | 2.28 | 3.90 | 2.70 | 0.25 | 1.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.80 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.94Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -91619.11 (J) H = -72869.72 (J) S = 14.73 (J/K) V = 1.93 (cc) Cp = 7.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.62 | 96.42 | 93.45 | 5.37 | -5.07 | 8.06 | 0.39 |

feldspar mass = 25.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -420597.65 (J) H = -345127.66 (J) S = 59.28 (J/K) V = 9.70 (cc) Cp = 31.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.24 | 25.08 | 3.69 |

quartz mass = 12.32 (gm) density = 2.56 (gm/cc)
SiO2
G = -205190.15 (J) H = -170396.35 (J) S = 27.33 (J/K) V = 4.82 (cc) Cp = 14.63 (J/K)

Total solids mass = 44.40 (gm) density = 2.70 (gm/cc)
G = -717406.91 (J) H = -588393.73 (J) S = 101.33 (J/K) V = 16.45 (cc) Cp = 53.50 (J/K)

Viscosity of the System: 7.54 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1621315.52 (J) H = -1309474.42 (J) S = 244.94 (J/K) V = 39.02 (cc) Cp = 127.87 (J/K)

Oxygen delta moles = -0.000726903 delta grams = -0.02326
G = 209.78 (J) H = -23.53 (J) S = -0.18 (J/K) V = -76.95 (cc) Cp = -0.03 (J/K)

**********_____**********
Title: felsic

T = 990.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.68  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 52.12 (gm)  density = 2.46 (gm/cc)  viscosity = 5.93 (log 10 poise)  (analysis in wt %)
G = -846926.90 (J)  H = -676968.17 (J)  S = 134.55 (J/K)  V = 21.19 (cc)  Cp = 69.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.56 | 0.82 | 13.71 | 0.61 | 0.00 | 2.65 | 0.15 | 0.38 | 0.00 | 0.00 | 2.25 | 3.84 | 2.84 | 0.27 | 1.93 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 7.20 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.92Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -96300.52 (J)  H = -76718.65 (J)  S = 15.50 (J/K)  V = 2.04 (cc)  Cp = 8.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.23 | 96.52 | 95.82 | 5.45 | -5.14 | 8.18 | 0.39 |

feldspar  mass = 27.31 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -453598.21 (J)  H = -373047.58 (J)  S = 63.77 (J/K)  V = 10.48 (cc)  Cp = 33.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.28 | 24.83 | 3.89 |

quartz  mass = 13.35 (gm)  density = 2.56 (gm/cc)
SiO2
G = -222009.25 (J)  H = -184767.26 (J)  S = 29.48 (J/K)  V = 5.22 (cc)  Cp = 15.84 (J/K)

Total solids  mass = 47.86 (gm)  density = 2.70 (gm/cc)
G = -771907.97 (J)  H = -634533.48 (J)  S = 108.76 (J/K)  V = 17.74 (cc)  Cp = 57.59 (J/K)

Viscosity of the System: 8.03 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.57 (gm/cc)
G = -1618834.88 (J)  H = -1311501.65 (J)  S = 243.31 (J/K)  V = 38.93 (cc)  Cp = 127.33 (J/K)

Oxygen  delta moles = -0.000800195  delta grams = -0.0256053
G = 228.92 (J)  H = -25.61 (J)  S = -0.20 (J/K)  V = -84.04 (cc)  Cp = -0.03 (J/K)

**********_____**********
Title: felsic

T = 980.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.66  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 48.99 (gm)  density = 2.46 (gm/cc)  viscosity = 5.93 (log 10 poise)  (analysis in wt %)
G = -795397.31 (J)  H = -637050.52 (J)  S = 126.36 (J/K)  V = 19.95 (cc)  Cp = 65.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

70.48 0.87 13.69 0.59 0.00 2.55 0.16 0.35 0.00 0.00 2.22 3.77 2.97 0.29 2.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.56 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.90Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -100509.54 (J) H = -80212.56 (J) S = 16.20 (J/K) V = 2.13 (cc) Cp = 8.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.57 | 96.61 | 97.96 | 5.53 | -5.19 | 8.28 | 0.38 |

feldspar mass = 29.14 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -483323.15 (J) H = -398391.16 (J) S = 67.77 (J/K) V = 11.18 (cc) Cp = 35.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.31 | 24.61 | 4.08 |

quartz mass = 14.28 (gm) density = 2.56 (gm/cc)
SiO2
G = -237142.09 (J) H = -197792.79 (J) S = 31.40 (J/K) V = 5.58 (cc) Cp = 16.93 (J/K)

Total solids mass = 50.98 (gm) density = 2.70 (gm/cc)
G = -820974.78 (J) H = -676396.51 (J) S = 115.37 (J/K) V = 18.90 (cc) Cp = 61.28 (J/K)

Viscosity of the System: 9.06 (log 10 poise)

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1616372.09 (J) H = -1313447.03 (J) S = 241.73 (J/K) V = 38.85 (cc) Cp = 126.84 (J/K)

Oxygen delta moles = -0.000870168 delta grams = -0.0278443
G = 246.75 (J) H = -27.54 (J) S = -0.22 (J/K) V = -90.66 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 970.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.06 COH = 1.64 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 46.14 (gm) density = 2.45 (gm/cc) viscosity = 5.93 (log 10 poise) (analysis in wt %)
G = -748622.33 (J) H = -600789.38 (J) S = 118.92 (J/K) V = 18.82 (cc) Cp = 61.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.40 | 0.92 | 13.67 | 0.57 | 0.00 | 2.44 | 0.17 | 0.32 | 0.00 | 0.00 | 2.20 | 3.70 | 3.11 | 0.30 | 2.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.90 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.88Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -104283.88 (J) H = -83380.13 (J) S = 16.82 (J/K) V = 2.22 (cc) Cp = 9.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.67 | 96.69 | 99.89 | 5.60 | -5.25 | 8.36 | 0.37 |

feldspar mass = 30.80 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.24Al1.24Si2.76O8
G = -510192.11 (J) H = -421486.92 (J) S = 71.36 (J/K) V = 11.82 (cc) Cp = 37.70 (J/K)

albite anorthite sanidine
71.32 24.40 4.28

quartz mass = 15.13 (gm) density = 2.56 (gm/cc)
SiO2
G = -250828.41 (J) H = -209664.10 (J) S = 33.11 (J/K) V = 5.91 (cc) Cp = 17.91 (J/K)

Total solids mass = 53.83 (gm) density = 2.70 (gm/cc)
G = -865304.40 (J) H = -714531.16 (J) S = 121.28 (J/K) V = 19.96 (cc) Cp = 64.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1613926.73 (J) H = -1315320.54 (J) S = 240.20 (J/K) V = 38.77 (cc) Cp = 126.39 (J/K)

Oxygen delta moles = -0.000936706 delta grams = -0.0299735
G = 263.26 (J) H = -29.31 (J) S = -0.24 (J/K) V = -96.82 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 960.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.05 COH = 1.61 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 43.55 (gm) density = 2.45 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -706011.08 (J) H = -567728.93 (J) S = 112.14 (J/K) V = 17.79 (cc) Cp = 58.30 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.31 0.98 13.66 0.55 0.00 2.33 0.18 0.30 0.00 0.00 2.18 3.64 3.24 0.32 2.30 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.20 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.86Fe"'0.03Ti0.00Al0.14Si1.91O6
G = -107659.01 (J) H = -86248.07 (J) S = 17.36 (J/K) V = 2.30 (cc) Cp = 9.33 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.55 96.77 101.61 5.67 -5.29 8.42 0.37

feldspar mass = 32.32 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.24Al1.24Si2.76O8
G = -534560.60 (J) H = -442613.32 (J) S = 74.56 (J/K) V = 12.40 (cc) Cp = 39.52 (J/K)
albite anorthite sanidine
71.32 24.21 4.47

quartz mass = 15.90 (gm) density = 2.56 (gm/cc)
SiO2
G = -263267.68 (J) H = -220540.36 (J) S = 34.65 (J/K) V = 6.22 (cc) Cp = 18.81 (J/K)

Total solids mass = 56.42 (gm) density = 2.70 (gm/cc)
G = -905487.30 (J) H = -749401.75 (J) S = 126.57 (J/K) V = 20.92 (cc) Cp = 67.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1611498.37 (J) H = -1317130.68 (J) S = 238.71 (J/K) V = 38.71 (cc) Cp = 125.96 (J/K)

Oxygen delta moles = -0.000999764 delta grams = -0.0319913
G = 278.47 (J) H = -30.92 (J) S = -0.25 (J/K) V = -102.50 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 950.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.04 COH = 1.58 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 40.82 (gm) density = 2.44 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -661684.92 (J) H = -533160.12 (J) S = 105.08 (J/K) V = 16.72 (cc) Cp = 54.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.33 | 0.89 | 13.67 | 0.53 | 0.00 | 2.19 | 0.19 | 0.28 | 0.00 | 0.00 | 2.15 | 3.58 | 3.39 | 0.34 | 2.46 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.39 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.85Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -109757.46 (J) H = -88129.73 (J) S = 17.68 (J/K) V = 2.35 (cc) Cp = 9.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.64 | 96.82 | 102.69 | 5.68 | -5.33 | 8.42 | 0.36 |

feldspar mass = 33.87 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -559199.39 (J) H = -464055.68 (J) S = 77.79 (J/K) V = 12.99 (cc) Cp = 41.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.21 | 24.08 | 4.71 |

quartz mass = 16.75 (gm) density = 2.56 (gm/cc)
SiO2
G = -277060.78 (J) H = -232598.21 (J) S = 36.35 (J/K) V = 6.55 (cc) Cp = 19.80 (J/K)

rhm-oxide mass = 0.14 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.10Fe'"0.20Al0.13Ti0.84O3
G = -1398.43 (J) H = -1064.62 (J) S = 0.27 (J/K) V = 0.03 (cc) Cp = 0.13 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.93 | 9.85 | 71.23 | 2.37 | 6.62 |

Total solids mass = 59.15 (gm) density = 2.70 (gm/cc)
G = -947416.07 (J) H = -785848.25 (J) S = 132.09 (J/K) V = 21.92 (cc) Cp = 70.83 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1609100.99 (J) H = -1319008.37 (J) S = 237.17 (J/K) V = 38.64 (cc) Cp = 125.50 (J/K)

Oxygen delta moles = -0.00103362 delta grams = -0.0330746
G = 285.31 (J) H = -31.60 (J) S = -0.26 (J/K) V = -105.12 (cc) Cp = -0.04 (J/K)

**********_____**********
Title: felsic

T = 940.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = 0.03  COH = 1.56  IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 38.42 (gm)  density = 2.44 (gm/cc)  viscosity = 5.91 (log 10 poise)  (analysis in wt %)
G = -622673.19 (J)  H = -502728.10 (J)  S = 98.87 (J/K)  V = 15.77 (cc)  Cp = 51.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.31 | 0.83 | 13.68 | 0.50 | 0.00 | 2.05 | 0.20 | 0.26 | 0.00 | 0.00 | 2.13 | 3.52 | 3.53 | 0.37 | 2.61 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.58 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.84Fe'''0.03Ti0.00Al0.14Si1.91O6
G = -111769.43 (J)  H = -89950.74 (J)  S = 17.99 (J/K)  V = 2.40 (cc)  Cp = 9.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.72 | 96.88 | 103.74 | 5.70 | -5.37 | 8.41 | 0.35 |

feldspar  mass = 35.24 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -580936.77 (J)  H = -483177.10 (J)  S = 80.58 (J/K)  V = 13.51 (cc)  Cp = 42.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.11 | 23.94 | 4.95 |

quartz  mass = 17.50 (gm)  density = 2.56 (gm/cc)
SiO2
G = -289028.61 (J)  H = -243170.29 (J)  S = 37.80 (J/K)  V = 6.84 (cc)  Cp = 20.67 (J/K)

rhm-oxide  mass = 0.23 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.02Fe"0.72Mg0.10Fe'''0.20Al0.13Ti0.84O3
G = -2307.92 (J)  H = -1762.28 (J)  S = 0.45 (J/K)  V = 0.05 (cc)  Cp = 0.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.73 | 9.76 | 71.55 | 2.48 | 6.49 |

Total solids  mass = 61.54 (gm)  density = 2.70 (gm/cc)
G = -984042.73 (J)  H = -818060.40 (J)  S = 136.82 (J/K)  V = 22.81 (cc)  Cp = 73.61 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.59 (gm/cc)
G = -1606715.92 (J)  H = -1320788.51 (J)  S = 235.69 (J/K)  V = 38.58 (cc)  Cp = 125.08 (J/K)

Oxygen  delta moles = -0.00107249  delta grams = -0.0343183
G = 293.35 (J)  H = -32.41 (J)  S = -0.27 (J/K)  V = -108.18 (cc)  Cp = -0.04 (J/K)

**********_____**********
Title: felsic

T = 930.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.36  delta HM = -5.02  NNO = 0.00  QFM = 0.02  COH = 1.53  IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 36.24 (gm) density = 2.43 (gm/cc) viscosity = 5.90 (log 10 poise) (analysis in wt %)
G = -587088.01 (J) H = -474934.80 (J) S = 93.22 (J/K) V = 14.91 (cc) Cp = 48.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.27 | 0.78 | 13.69 | 0.47 | 0.00 | 1.92 | 0.21 | 0.24 | 0.00 | 0.00 | 2.12 | 3.46 | 3.68 | 0.39 | 2.77 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.75 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.83Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -113520.14 (J) H = -91573.76 (J) S = 18.24 (J/K) V = 2.44 (cc) Cp = 9.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.67 | 96.93 | 104.68 | 5.72 | -5.40 | 8.39 | 0.35 |

feldspar mass = 36.49 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -600701.90 (J) H = -500735.88 (J) S = 83.09 (J/K) V = 13.99 (cc) Cp = 44.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.01 | 23.81 | 5.18 |

quartz mass = 18.18 (gm) density = 2.56 (gm/cc)
SiO2
G = -299944.47 (J) H = -252898.62 (J) S = 39.10 (J/K) V = 7.11 (cc) Cp = 21.46 (J/K)

rhm-oxide mass = 0.31 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.10Fe'"0.19Al0.13Ti0.84O3
G = -3091.58 (J) H = -2367.84 (J) S = 0.60 (J/K) V = 0.07 (cc) Cp = 0.30 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.54 | 9.65 | 71.86 | 2.59 | 6.36 |

Total solids mass = 63.73 (gm) density = 2.70 (gm/cc)
G = -1017258.09 (J) H = -847576.10 (J) S = 141.03 (J/K) V = 23.61 (cc) Cp = 76.13 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1604346.10 (J) H = -1322510.90 (J) S = 234.25 (J/K) V = 38.52 (cc) Cp = 124.69 (J/K)

Oxygen delta moles = -0.00111017 delta grams = -0.0355242
G = 300.88 (J) H = -33.15 (J) S = -0.28 (J/K) V = -111.05 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 920.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.02 COH = 1.50 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 34.23 (gm) density = 2.43 (gm/cc) viscosity = 5.89 (log 10 poise) (analysis in wt %)
G = -554469.50 (J) H = -449424.27 (J) S = 88.04 (J/K) V = 14.11 (cc) Cp = 45.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

70.22 0.74 13.70 0.45 0.00 1.79 0.22 0.23 0.00 0.00 2.10 3.39 3.81 0.41 2.93 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.89 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.83Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -115040.19 (J) H = -93021.63 (J) S = 18.45 (J/K) V = 2.48 (cc) Cp = 10.04 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-111.51 96.98 105.51 5.74 -5.44 8.37 0.34

feldspar mass = 37.64 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -618756.61 (J) H = -516939.70 (J) S = 85.33 (J/K) V = 14.43 (cc) Cp = 45.84 (J/K)
albite anorthite sanidine
70.90 23.68 5.42

quartz mass = 18.81 (gm) density = 2.56 (gm/cc)
SiO2
G = -309955.46 (J) H = -261901.71 (J) S = 40.27 (J/K) V = 7.36 (cc) Cp = 22.18 (J/K)

rhm-oxide mass = 0.38 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.19Al0.12Ti0.84O3
G = -3769.49 (J) H = -2895.91 (J) S = 0.73 (J/K) V = 0.08 (cc) Cp = 0.36 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.38 9.53 72.16 2.69 6.24

Total solids mass = 65.73 (gm) density = 2.70 (gm/cc)
G = -1047521.75 (J) H = -874758.95 (J) S = 144.80 (J/K) V = 24.35 (cc) Cp = 78.43 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1601991.25 (J) H = -1324183.22 (J) S = 232.84 (J/K) V = 38.47 (cc) Cp = 124.33 (J/K)

Oxygen delta moles = -0.00114662 delta grams = -0.0366906
G = 307.89 (J) H = -33.83 (J) S = -0.29 (J/K) V = -113.75 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 910.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.01 COH = 1.48 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 32.39 (gm) density = 2.42 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -524430.81 (J) H = -425897.02 (J) S = 83.28 (J/K) V = 13.38 (cc) Cp = 43.46 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.14 0.69 13.72 0.43 0.00 1.67 0.23 0.21 0.00 0.00 2.09 3.33 3.95 0.43 3.10 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.02 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.82Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -116356.94 (J) H = -94314.76 (J) S = 18.63 (J/K) V = 2.52 (cc) Cp = 10.17 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-112.25 97.03 106.26 5.76 -5.47 8.33 0.34

feldspar mass = 38.71 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.24Al1.24Si2.76O8
G = -635321.32 (J) H = -531963.48 (J) S = 87.36 (J/K) V = 14.84 (cc) Cp = 47.09 (J/K)
albite anorthite sanidine
70.78 23.56 5.66

quartz mass = 19.40 (gm) density = 2.56 (gm/cc)
SiO2
G = -319184.07 (J) H = -270278.30 (J) S = 41.34 (J/K) V = 7.59 (cc) Cp = 22.85 (J/K)

rhm-oxide mass = 0.44 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.19Al0.12Ti0.84O3
G = -4357.95 (J) H = -3358.36 (J) S = 0.84 (J/K) V = 0.10 (cc) Cp = 0.42 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.23 9.40 72.46 2.79 6.12

Total solids mass = 67.57 (gm) density = 2.70 (gm/cc)
G = -1075220.27 (J) H = -899914.90 (J) S = 148.17 (J/K) V = 25.04 (cc) Cp = 80.54 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1599651.08 (J) H = -1325811.91 (J) S = 231.45 (J/K) V = 38.42 (cc) Cp = 123.99 (J/K)

Oxygen delta moles = -0.00118181 delta grams = -0.0378164
G = 314.39 (J) H = -34.45 (J) S = -0.29 (J/K) V = -116.26 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 30.68 (gm) density = 2.42 (gm/cc) viscosity = 5.85 (log 10 poise) (analysis in wt %)
G = -496643.99 (J) H = -404098.97 (J) S = 78.89 (J/K) V = 12.70 (cc) Cp = 41.19 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.05 0.65 13.73 0.40 0.00 1.56 0.24 0.20 0.00 0.00 2.08 3.27 4.08 0.46 3.27 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.14 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.07Mg0.81Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -117494.70 (J) H = -95471.32 (J) S = 18.77 (J/K) V = 2.55 (cc) Cp = 10.29 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-112.91 97.08 106.92 5.78 -5.50 8.30 0.33

feldspar mass = 39.70 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -650583.16 (J) H = -545955.83 (J) S = 89.18 (J/K) V = 15.22 (cc) Cp = 48.25 (J/K)

albite anorthite sanidine
70.66 23.44 5.90

quartz mass = 19.94 (gm) density = 2.56 (gm/cc)
SiO2
G = -327733.24 (J) H = -278111.43 (J) S = 42.30 (J/K) V = 7.80 (cc) Cp = 23.48 (J/K)

rhm-oxide mass = 0.49 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.19Al0.12Ti0.85O3
G = -4870.29 (J) H = -3764.88 (J) S = 0.94 (J/K) V = 0.11 (cc) Cp = 0.47 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.08 9.26 72.76 2.89 6.00

Total solids mass = 69.28 (gm) density = 2.70 (gm/cc)
G = -1100681.38 (J) H = -923303.47 (J) S = 151.20 (J/K) V = 25.67 (cc) Cp = 82.48 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1597325.38 (J) H = -1327402.44 (J) S = 230.08 (J/K) V = 38.37 (cc) Cp = 123.67 (J/K)

Oxygen delta moles = -0.00121571 delta grams = -0.0389013
G = 320.38 (J) H = -35.00 (J) S = -0.30 (J/K) V = -118.58 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 890.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.01 COH = 1.42 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 29.10 (gm) density = 2.41 (gm/cc) viscosity = 5.82 (log 10 poise) (analysis in wt %)
G = -470828.82 (J) H = -383812.89 (J) S = 74.81 (J/K) V = 12.07 (cc) Cp = 39.09 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.94 0.61 13.75 0.38 0.00 1.45 0.25 0.19 0.00 0.00 2.07 3.21 4.21 0.48 3.45 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.24 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.08Mg0.81Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -118475.05 (J) H = -96507.43 (J) S = 18.89 (J/K) V = 2.57 (cc) Cp = 10.39 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-113.49 97.13 107.52 5.80 -5.54 8.26 0.33

feldspar mass = 40.62 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -664702.34 (J) H = -559044.13 (J) S = 90.84 (J/K) V = 15.57 (cc) Cp = 49.33 (J/K)
albite anorthite sanidine
70.53 23.32 6.14

quartz mass = 20.45 (gm) density = 2.56 (gm/cc)
SiO2
G = -335690.23 (J) H = -285471.56 (J) S = 43.17 (J/K) V = 8.00 (cc) Cp = 24.05 (J/K)

rhm-oxide mass = 0.54 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.18Al0.12Ti0.85O3
G = -5317.51 (J) H = -4123.46 (J) S = 1.03 (J/K) V = 0.12 (cc) Cp = 0.51 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.95 | 9.11 | 73.06 | 2.99 | 5.89 |

Total solids mass = 70.86 (gm) density = 2.70 (gm/cc)
G = -1124185.13 (J) H = -945146.58 (J) S = 153.93 (J/K) V = 26.25 (cc) Cp = 84.28 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1595013.95 (J) H = -1328959.47 (J) S = 228.74 (J/K) V = 38.32 (cc) Cp = 123.37 (J/K)

Oxygen delta moles = -0.00124833 delta grams = -0.0399451
G = 325.87 (J) H = -35.50 (J) S = -0.31 (J/K) V = -120.72 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 880.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.02 COH = 1.39 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 27.62 (gm) density = 2.41 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -446743.95 (J) H = -364851.42 (J) S = 71.02 (J/K) V = 11.48 (cc) Cp = 37.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.81 | 0.57 | 13.77 | 0.36 | 0.00 | 1.35 | 0.26 | 0.18 | 0.00 | 0.00 | 2.07 | 3.15 | 4.34 | 0.51 | 3.63 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.33 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.08Mg0.80Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -119317.07 (J) H = -97437.36 (J) S = 18.97 (J/K) V = 2.59 (cc) Cp = 10.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.01 | 97.18 | 108.05 | 5.82 | -5.57 | 8.21 | 0.32 |

feldspar mass = 41.49 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.70Ca0.23Al1.23Si2.77O8
G = -677817.16 (J) H = -571338.45 (J) S = 92.34 (J/K) V = 15.89 (cc) Cp = 50.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.39 | 23.21 | 6.39 |

quartz mass = 20.93 (gm) density = 2.56 (gm/cc)
SiO2
G = -343129.71 (J) H = -292419.05 (J) S = 43.98 (J/K) V = 8.19 (cc) Cp = 24.59 (J/K)

rhm-oxide mass = 0.58 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.09Fe'"0.18Al0.12Ti0.85O3
G = -5708.73 (J) H = -4440.72 (J) S = 1.10 (J/K) V = 0.13 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.83 | 8.96 | 73.35 | 3.09 | 5.78 |

Total solids mass = 72.33 (gm) density = 2.70 (gm/cc)
G = -1145972.67 (J) H = -965635.58 (J) S = 156.39 (J/K) V = 26.80 (cc) Cp = 85.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1592716.62 (J) H = -1330487.00 (J) S = 227.40 (J/K) V = 38.28 (cc) Cp = 123.08 (J/K)

Oxygen delta moles = -0.00127968 delta grams = -0.0409483
G = 330.87 (J) H = -35.94 (J) S = -0.32 (J/K) V = -122.69 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 26.24 (gm) density = 2.40 (gm/cc) viscosity = 5.76 (log 10 poise) (analysis in wt %)
G = -424179.80 (J) H = -347051.59 (J) S = 67.47 (J/K) V = 10.93 (cc) Cp = 35.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.66 | 0.53 | 13.80 | 0.34 | 0.00 | 1.26 | 0.27 | 0.17 | 0.00 | 0.00 | 2.06 | 3.10 | 4.46 | 0.54 | 3.82 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.41 (gm) density = 3.60 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.80Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -120037.62 (J) H = -98273.75 (J) S = 19.04 (J/K) V = 2.61 (cc) Cp = 10.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -114.48 | 97.23 | 108.52 | 5.84 | -5.60 | 8.17 | 0.31 |

feldspar mass = 42.30 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -690048.09 (J) H = -582934.87 (J) S = 93.70 (J/K) V = 16.20 (cc) Cp = 51.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.25 | 23.11 | 6.64 |

quartz mass = 21.39 (gm) density = 2.56 (gm/cc)
SiO2
G = -350116.17 (J) H = -299006.10 (J) S = 44.71 (J/K) V = 8.36 (cc) Cp = 25.10 (J/K)

rhm-oxide mass = 0.62 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.09Fe'"0.18Al0.11Ti0.86O3
G = -6051.56 (J) H = -4722.20 (J) S = 1.16 (J/K) V = 0.13 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.70 | 8.80 | 73.64 | 3.18 | 5.68 |

Total solids mass = 73.72 (gm) density = 2.70 (gm/cc)
G = -1166253.45 (J) H = -984936.92 (J) S = 158.61 (J/K) V = 27.31 (cc) Cp = 87.51 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1590433.25 (J) H = -1331988.51 (J) S = 226.08 (J/K) V = 38.24 (cc) Cp = 122.81 (J/K)

Oxygen delta moles = -0.00130978 delta grams = -0.0419115
G = 335.40 (J) H = -36.32 (J) S = -0.33 (J/K) V = -124.49 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 24.87 (gm) density = 2.40 (gm/cc) viscosity = 5.71 (log 10 poise) (analysis in wt %)
G = -401767.40 (J) H = -329246.32 (J) S = 64.00 (J/K) V = 10.38 (cc) Cp = 33.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.65 | 0.50 | 13.63 | 0.31 | 0.00 | 1.14 | 0.28 | 0.16 | 0.00 | 0.00 | 2.05 | 3.13 | 4.57 | 0.54 | 4.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.01 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.62Mg0.23)3Al2Si3O12
G = -13513.99 (J) H = -11274.56 (J) S = 1.98 (J/K) V = 0.25 (cc) Cp = 1.09 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.46 | 14.77 | 22.77 |

orthopyroxene mass = 8.79 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.07Mg0.82Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -112295.25 (J) H = -92234.76 (J) S = 17.70 (J/K) V = 2.44 (cc) Cp = 9.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -112.60 | 97.16 | 107.19 | 5.58 | -5.36 | 7.71 | 0.32 |

feldspar mass = 42.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.70Ca0.23Al1.23Si2.77O8
G = -694816.59 (J) H = -588227.94 (J) S = 94.06 (J/K) V = 16.34 (cc) Cp = 51.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.37 | 22.60 | 7.03 |

quartz mass = 21.97 (gm) density = 2.56 (gm/cc)
SiO2
G = -359195.87 (J) H = -307409.34 (J) S = 45.70 (J/K) V = 8.59 (cc) Cp = 25.76 (J/K)

rhm-oxide mass = 0.65 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.09Fe'"0.17Al0.11Ti0.86O3
G = -6341.39 (J) H = -4965.48 (J) S = 1.21 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.88 | 8.49 | 73.84 | 3.33 | 5.46 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -212.91 (J) H = -178.38 (J) S = 0.03 (J/K) V = 0.00 (cc) Cp = 0.02 (J/K)

Total solids mass = 75.09 (gm) density = 2.70 (gm/cc)

G = -1186376.02 (J)  H = -1004290.47 (J)  S = 160.69 (J/K)  V = 27.78 (cc)  Cp = 89.01 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.62 (gm/cc)
G = -1588143.42 (J)  H = -1333536.80 (J)  S = 224.69 (J/K)  V = 38.16 (cc)  Cp = 122.48 (J/K)

Oxygen  delta moles = -0.00137782  delta grams = -0.0440886
G = 349.40 (J)  H = -37.72 (J)  S = -0.34 (J/K)  V = -129.81 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 850.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.84  delta HM = -5.08  NNO = 0.00  QFM = -0.05  COH = 1.30
IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid  mass = 23.57 (gm)  density = 2.39 (gm/cc)  viscosity = 5.64 (log 10 poise)  (analysis in wt %)
G = -380570.08 (J)  H = -312362.94 (J)  S = 60.73 (J/K)  V = 9.86 (cc)  Cp = 31.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.61 | 0.47 | 13.46 | 0.29 | 0.00 | 1.03 | 0.29 | 0.16 | 0.00 | 0.00 | 2.04 | 3.16 | 4.67 | 0.55 | 4.26 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 2.00 (gm)  density = 3.96 (gm/cc)  (analysis in mole %)
(Ca0.15Fe"0.62Mg0.23)3Al2Si3O12
G = -26699.59 (J)  H = -22334.97 (J)  S = 3.89 (J/K)  V = 0.50 (cc)  Cp = 2.15 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.97 | 15.27 | 22.76 |

orthopyroxene  mass = 8.18 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.06Mg0.84Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -104766.44 (J)  H = -86335.16 (J)  S = 16.41 (J/K)  V = 2.28 (cc)  Cp = 9.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.52 | 97.07 | 105.68 | 5.32 | -5.11 | 7.24 | 0.32 |

feldspar  mass = 42.98 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.07Na0.70Ca0.22Al1.22Si2.78O8
G = -698975.51 (J)  H = -593019.67 (J)  S = 94.34 (J/K)  V = 16.47 (cc)  Cp = 52.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.48 | 22.08 | 7.45 |

quartz  mass = 22.53 (gm)  density = 2.56 (gm/cc)
SiO2
G = -367876.22 (J)  H = -315502.33 (J)  S = 46.63 (J/K)  V = 8.81 (cc)  Cp = 26.39 (J/K)

rhm-oxide  mass = 0.68 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.74Mg0.09Fe'"0.16Al0.11Ti0.87O3
G = -6594.47 (J)  H = -5181.58 (J)  S = 1.26 (J/K)  V = 0.15 (cc)  Cp = 0.63 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.07 | 8.18 | 74.00 | 3.48 | 5.26 |

apatite  mass = 0.03 (gm)  density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -388.10 (J)  H = -325.92 (J)  S = 0.06 (J/K)  V = 0.01 (cc)  Cp = 0.03 (J/K)

Total solids  mass = 76.39 (gm)  density = 2.71 (gm/cc)
G = -1205300.33 (J)  H = -1022699.63 (J)  S = 162.58 (J/K)  V = 28.22 (cc)  Cp = 90.43 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.62 (gm/cc)
G = -1585870.41 (J)  H = -1335062.57 (J)  S = 223.31 (J/K)  V = 38.08 (cc)  Cp = 122.17 (J/K)

Oxygen  delta moles = -0.00144038  delta grams = -0.0460904
G = 361.70 (J)  H = -38.92 (J)  S = -0.36 (J/K)  V = -134.51 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 840.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.04  delta HM = -5.09  NNO = 0.00  QFM = -0.06  COH = 1.27
IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid  mass = 22.33 (gm)  density = 2.38 (gm/cc)  viscosity = 5.57 (log 10 poise)  (analysis in wt %)
G = -360418.81 (J)  H = -296269.46 (J)  S = 57.63 (J/K)  V = 9.37 (cc)  Cp = 30.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.54 | 0.44 | 13.30 | 0.27 | 0.00 | 0.94 | 0.30 | 0.16 | 0.00 | 0.00 | 2.04 | 3.20 | 4.76 | 0.56 | 4.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 2.92 (gm)  density = 3.96 (gm/cc)  (analysis in mole %)
(Ca0.16Fe"0.61Mg0.23)3Al2Si3O12
G = -39017.36 (J)  H = -32726.78 (J)  S = 5.65 (J/K)  V = 0.74 (cc)  Cp = 3.14 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.44 | 15.78 | 22.78 |

orthopyroxene  mass = 7.61 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.86Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -97794.35 (J)  H = -80856.51 (J)  S = 15.22 (J/K)  V = 2.13 (cc)  Cp = 8.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.36 | 96.98 | 104.07 | 5.06 | -4.86 | 6.79 | 0.32 |

feldspar  mass = 43.29 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.71Ca0.22Al1.22Si2.78O8
G = -702913.73 (J)  H = -597638.59 (J)  S = 94.57 (J/K)  V = 16.59 (cc)  Cp = 52.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.57 | 21.55 | 7.88 |

quartz  mass = 23.06 (gm)  density = 2.56 (gm/cc)
SiO2
G = -376119.04 (J)  H = -323250.02 (J)  S = 47.49 (J/K)  V = 9.02 (cc)  Cp = 26.99 (J/K)

rhm-oxide  mass = 0.70 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.74Mg0.09Fe'"0.16Al0.10Ti0.87O3
G = -6816.82 (J)  H = -5374.90 (J)  S = 1.30 (J/K)  V = 0.15 (cc)  Cp = 0.65 (J/K)

geikielite hematite ilmenite pyrophanite corundum
9.28 7.88 74.15 3.63 5.06

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -534.60 (J) H = -450.00 (J) S = 0.08 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 77.62 (gm) density = 2.71 (gm/cc)
G = -1223195.91 (J) H = -1040296.78 (J) S = 164.31 (J/K) V = 28.64 (cc) Cp = 91.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1583614.72 (J) H = -1336566.25 (J) S = 221.94 (J/K) V = 38.01 (cc) Cp = 121.88 (J/K)

Oxygen delta moles = -0.00149629 delta grams = -0.0478793
G = 372.03 (J) H = -39.90 (J) S = -0.37 (J/K) V = -138.48 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 21.14 (gm) density = 2.38 (gm/cc) viscosity = 5.49 (log 10 poise) (analysis in wt %)
G = -341127.65 (J) H = -280816.45 (J) S = 54.67 (J/K) V = 8.90 (cc) Cp = 28.52 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.44 0.41 13.14 0.25 0.00 0.85 0.32 0.15 0.00 0.00 2.04 3.25 4.84 0.57 4.74 0.00 0.00 0.00 0.00

garnet mass = 3.78 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.61Mg0.23)3Al2Si3O12
G = -50592.13 (J) H = -42549.29 (J) S = 7.29 (J/K) V = 0.96 (cc) Cp = 4.07 (J/K)
almandine grossular pyrope
60.89 16.30 22.80

orthopyroxene mass = 7.09 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.88Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -91307.18 (J) H = -75743.33 (J) S = 14.11 (J/K) V = 1.98 (cc) Cp = 7.98 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-106.12 96.89 102.36 4.81 -4.62 6.36 0.32

feldspar mass = 43.60 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -706682.51 (J) H = -602127.00 (J) S = 94.78 (J/K) V = 16.71 (cc) Cp = 52.76 (J/K)
albite anorthite sanidine
70.64 21.02 8.34

quartz mass = 23.58 (gm) density = 2.56 (gm/cc)
SiO2
G = -383998.74 (J) H = -330714.04 (J) S = 48.30 (J/K) V = 9.22 (cc) Cp = 27.56 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe"'0.15Al0.10Ti0.88O3
G = -7012.86 (J) H = -5548.66 (J) S = 1.33 (J/K) V = 0.16 (cc) Cp = 0.67 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.50 | 7.57 | 74.27 | 3.77 | 4.88 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -654.77 (J) H = -552.44 (J) S = 0.09 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

Total solids mass = 78.81 (gm) density = 2.71 (gm/cc)
G = -1240248.19 (J) H = -1057234.75 (J) S = 165.90 (J/K) V = 29.04 (cc) Cp = 93.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1581375.84 (J) H = -1338051.20 (J) S = 220.57 (J/K) V = 37.93 (cc) Cp = 121.61 (J/K)

Oxygen delta moles = -0.0015463 delta grams = -0.0494796
G = 380.65 (J) H = -40.69 (J) S = -0.38 (J/K) V = -141.83 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 820.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.08 COH = 1.21 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 20.00 (gm) density = 2.37 (gm/cc) viscosity = 5.40 (log 10 poise) (analysis in wt %)
G = -322524.24 (J) H = -265864.34 (J) S = 51.83 (J/K) V = 8.44 (cc) Cp = 27.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.29 | 0.38 | 12.99 | 0.23 | 0.00 | 0.77 | 0.33 | 0.15 | 0.00 | 0.00 | 2.04 | 3.30 | 4.91 | 0.59 | 5.01 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.60 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.60Mg0.23)3Al2Si3O12
G = -61532.75 (J) H = -51889.40 (J) S = 8.82 (J/K) V = 1.16 (cc) Cp = 4.94 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.32 | 16.84 | 22.85 |

orthopyroxene mass = 6.60 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.90Fe"'0.02Ti0.00Al0.11Si1.94O6
G = -85241.71 (J) H = -70946.62 (J) S = 13.08 (J/K) V = 1.85 (cc) Cp = 7.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.80 | 96.80 | 100.55 | 4.56 | -4.39 | 5.95 | 0.33 |

feldspar mass = 43.89 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.71Ca0.20Al1.20Si2.80O8
G = -710333.66 (J) H = -606528.08 (J) S = 94.96 (J/K) V = 16.83 (cc) Cp = 53.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.69 | 20.48 | 8.83 |

quartz mass = 24.07 (gm) density = 2.56 (gm/cc)
SiO2
G = -391584.40 (J) H = -337951.95 (J) S = 49.06 (J/K) V = 9.41 (cc) Cp = 28.11 (J/K)

rhm-oxide mass = 0.74 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.15Al0.09Ti0.88O3
G = -7186.29 (J) H = -5705.61 (J) S = 1.35 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.74 | 7.27 | 74.37 | 3.91 | 4.71 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -750.31 (J) H = -634.52 (J) S = 0.11 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 79.95 (gm) density = 2.72 (gm/cc)
G = -1256629.11 (J) H = -1073656.18 (J) S = 167.38 (J/K) V = 29.43 (cc) Cp = 94.34 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1579153.35 (J) H = -1339520.52 (J) S = 219.21 (J/K) V = 37.87 (cc) Cp = 121.35 (J/K)

Oxygen delta moles = -0.00159108 delta grams = -0.0509128
G = 387.74 (J) H = -41.31 (J) S = -0.39 (J/K) V = -144.61 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 810.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.09 COH = 1.18 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 18.89 (gm) density = 2.36 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -304443.93 (J) H = -251278.62 (J) S = 49.08 (J/K) V = 7.99 (cc) Cp = 25.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.10 | 0.35 | 12.84 | 0.21 | 0.00 | 0.69 | 0.35 | 0.15 | 0.00 | 0.00 | 2.05 | 3.36 | 4.96 | 0.62 | 5.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.37 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.60Mg0.23)3Al2Si3O12
G = -71935.36 (J) H = -60824.17 (J) S = 10.26 (J/K) V = 1.36 (cc) Cp = 5.77 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.72 | 17.38 | 22.91 |

orthopyroxene mass = 6.14 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.92Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -79541.46 (J) H = -66422.39 (J) S = 12.11 (J/K) V = 1.72 (cc) Cp = 6.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.40 | 96.70 | 98.65 | 4.32 | -4.16 | 5.55 | 0.33 |

feldspar mass = 44.19 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.09Na0.71Ca0.20Al1.20Si2.80O8
G = -713921.11 (J) H = -610887.21 (J) S = 95.12 (J/K) V = 16.95 (cc) Cp = 53.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.72 | 19.94 | 9.35 |

quartz mass = 24.56 (gm) density = 2.56 (gm/cc)
SiO2
G = -398942.53 (J) H = -345019.63 (J) S = 49.78 (J/K) V = 9.60 (cc) Cp = 28.64 (J/K)

rhm-oxide mass = 0.75 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.14Al0.09Ti0.88O3
G = -7340.27 (J) H = -5848.10 (J) S = 1.38 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.99 | 6.97 | 74.45 | 4.05 | 4.55 |

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -822.25 (J) H = -696.97 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 81.06 (gm) density = 2.72 (gm/cc)
G = -1272502.99 (J) H = -1089698.48 (J) S = 168.77 (J/K) V = 29.81 (cc) Cp = 95.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1576946.92 (J) H = -1340977.10 (J) S = 217.86 (J/K) V = 37.80 (cc) Cp = 121.12 (J/K)

Oxygen delta moles = -0.00163124 delta grams = -0.0521978
G = 393.51 (J) H = -41.78 (J) S = -0.40 (J/K) V = -146.90 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 17.80 (gm) density = 2.36 (gm/cc) viscosity = 5.18 (log 10 poise) (analysis in wt %)
G = -286723.22 (J) H = -236924.39 (J) S = 46.40 (J/K) V = 7.55 (cc) Cp = 24.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.86 | 0.33 | 12.70 | 0.20 | 0.00 | 0.63 | 0.36 | 0.15 | 0.00 | 0.00 | 2.07 | 3.43 | 5.00 | 0.65 | 5.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.11 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.59Mg0.23)3Al2Si3O12
G = -81886.38 (J) H = -69423.25 (J) S = 11.61 (J/K) V = 1.55 (cc) Cp = 6.56 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.09 | 17.92 | 22.98 |

orthopyroxene mass = 5.70 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.97Mg0.94Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -74155.05 (J) H = -62130.34 (J) S = 11.21 (J/K) V = 1.60 (cc) Cp = 6.45 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-98.92 96.60 96.65 4.09 -3.94 5.18 0.33

feldspar mass = 44.48 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -717502.89 (J) H = -615253.78 (J) S = 95.28 (J/K) V = 17.06 (cc) Cp = 53.86 (J/K)
albite anorthite sanidine
70.72 19.38 9.90

quartz mass = 25.03 (gm) density = 2.56 (gm/cc)
SiO2
G = -406140.20 (J) H = -351973.87 (J) S = 50.47 (J/K) V = 9.79 (cc) Cp = 29.16 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.13Al0.09Ti0.89O3
G = -7477.54 (J) H = -5978.15 (J) S = 1.40 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.25 6.68 74.50 4.17 4.40

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -870.97 (J) H = -739.97 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

Total solids mass = 82.15 (gm) density = 2.72 (gm/cc)
G = -1288033.03 (J) H = -1105499.37 (J) S = 170.09 (J/K) V = 30.19 (cc) Cp = 96.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1574756.25 (J) H = -1342423.76 (J) S = 216.50 (J/K) V = 37.74 (cc) Cp = 120.92 (J/K)

Oxygen delta moles = -0.0016673 delta grams = -0.0533515
G = 398.10 (J) H = -42.12 (J) S = -0.41 (J/K) V = -148.76 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 790.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.11 COH = 1.11 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 16.61 (gm) density = 2.35 (gm/cc) viscosity = 5.04 (log 10 poise) (analysis in wt %)
G = -267756.24 (J) H = -221457.20 (J) S = 43.55 (J/K) V = 7.07 (cc) Cp = 22.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.43 | 0.30 | 12.74 | 0.18 | 0.00 | 0.57 | 0.39 | 0.15 | 0.00 | 0.00 | 2.04 | 3.51 | 4.96 | 0.70 | 6.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.09 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -95028.12 (J) H = -80757.98 (J) S = 13.42 (J/K) V = 1.80 (cc) Cp = 7.62 (J/K)
almandine grossular pyrope
58.89 17.41 23.70

orthopyroxene mass = 4.85 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.97Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -63374.60 (J) H = -53278.55 (J) S = 9.50 (J/K) V = 1.37 (cc) Cp = 5.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.63 | 96.75 | 94.41 | 4.03 | -3.88 | 4.99 | 0.33 |

clinopyroxene mass = 0.42 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.33Mg0.59Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -6069.96 (J) H = -5206.60 (J) S = 0.81 (J/K) V = 0.12 (cc) Cp = 0.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.17 | 9.00 | 32.86 | 9.25 | 0.08 | 4.17 | 8.47 |

feldspar mass = 44.36 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.18Al1.18Si2.82O8
G = -714340.79 (J) H = -613813.55 (J) S = 94.56 (J/K) V = 17.03 (cc) Cp = 53.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.18 | 18.37 | 10.45 |

feldspar mass = 0.20 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -3169.47 (J) H = -2718.08 (J) S = 0.42 (J/K) V = 0.08 (cc) Cp = 0.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.91 | 1.83 | 66.26 |

quartz mass = 25.58 (gm) density = 2.56 (gm/cc)
SiO2
G = -414520.76 (J) H = -359980.33 (J) S = 51.30 (J/K) V = 10.00 (cc) Cp = 29.76 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.11Fe'"0.13Al0.09Ti0.89O3
G = -7486.53 (J) H = -6007.34 (J) S = 1.39 (J/K) V = 0.17 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.62 | 6.34 | 74.38 | 4.29 | 4.37 |

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -840.22 (J) H = -715.50 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 83.33 (gm) density = 2.72 (gm/cc)
G = -1304830.46 (J) H = -1122477.94 (J) S = 171.52 (J/K) V = 30.58 (cc) Cp = 98.13 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1572586.69 (J) H = -1343935.14 (J) S = 215.07 (J/K) V = 37.65 (cc) Cp = 120.71 (J/K)

Oxygen delta moles = -0.00168985 delta grams = -0.0540731
G = 399.33 (J) H = -42.09 (J) S = -0.42 (J/K) V = -149.37 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 780.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.12 COH = 1.07

IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 15.12 (gm) density = 2.34 (gm/cc) viscosity = 4.78 (log 10 poise) (analysis in wt %)
G = -243834.26 (J) H = -201657.72 (J) S = 40.05 (J/K) V = 6.46 (cc) Cp = 20.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.89 | 0.26 | 12.57 | 0.18 | 0.00 | 0.54 | 0.45 | 0.15 | 0.00 | 0.00 | 2.07 | 3.78 | 4.73 | 0.76 | 6.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.81 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -104539.02 (J) H = -89051.90 (J) S = 14.71 (J/K) V = 1.98 (cc) Cp = 8.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.79 | 17.21 | 24.00 |

orthopyroxene mass = 4.51 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.99Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -59045.70 (J) H = -49791.63 (J) S = 8.79 (J/K) V = 1.27 (cc) Cp = 5.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.10 | 96.84 | 92.98 | 3.92 | -3.78 | 4.79 | 0.34 |

clinopyroxene mass = 0.75 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.26Mg0.33Fe'"0.04Ti0.40Al0.73Si1.25O6
G = -10874.22 (J) H = -9386.74 (J) S = 1.41 (J/K) V = 0.21 (cc) Cp = 0.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.17 | 1.74 | 26.00 | 70.45 | 9.00 | -4.94 | 7.91 |

feldspar mass = 43.40 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.72Ca0.18Al1.18Si2.82O8
G = -697975.63 (J) H = -601044.69 (J) S = 92.04 (J/K) V = 16.66 (cc) Cp = 52.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.02 | 17.76 | 10.22 |

feldspar mass = 1.45 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -22678.04 (J) H = -19491.51 (J) S = 3.03 (J/K) V = 0.57 (cc) Cp = 1.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.61 | 1.68 | 66.72 |

quartz mass = 26.25 (gm) density = 2.56 (gm/cc)
SiO2
G = -424858.33 (J) H = -369718.92 (J) S = 52.36 (J/K) V = 10.26 (cc) Cp = 30.51 (J/K)

rhm-oxide mass = 0.59 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.11Fe'"0.12Al0.09Ti0.90O3
G = -5761.20 (J) H = -4638.48 (J) S = 1.07 (J/K) V = 0.13 (cc) Cp = 0.54 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.83 | 6.10 | 74.25 | 4.53 | 4.28 |

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -851.10 (J) H = -726.43 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

Total solids mass = 84.82 (gm) density = 2.73 (gm/cc)
G = -1326583.25 (J) H = -1143850.29 (J) S = 173.51 (J/K) V = 31.11 (cc) Cp = 99.87 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1570417.51 (J) H = -1345508.01 (J) S = 213.56 (J/K) V = 37.57 (cc) Cp = 120.51 (J/K)

Oxygen delta moles = -0.00173965 delta grams = -0.0556669
G = 406.83 (J) H = -42.72 (J) S = -0.43 (J/K) V = -152.33 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 770.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.14 COH = 1.04 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 13.11 (gm) density = 2.33 (gm/cc) viscosity = 4.42 (log 10 poise) (analysis in wt %)
G = -211447.22 (J) H = -174710.43 (J) S = 35.22 (J/K) V = 5.64 (cc) Cp = 18.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.26 | 0.21 | 12.14 | 0.19 | 0.00 | 0.55 | 0.51 | 0.14 | 0.00 | 0.00 | 2.13 | 4.24 | 4.40 | 0.85 | 7.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.57 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -127669.61 (J) H = -108985.27 (J) S = 17.91 (J/K) V = 2.42 (cc) Cp = 10.25 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.41 | 17.28 | 23.31 |

orthopyroxene mass = 2.59 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -33718.60 (J) H = -28493.70 (J) S = 5.01 (J/K) V = 0.73 (cc) Cp = 2.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.39 | 96.97 | 94.30 | 3.80 | -3.67 | 4.65 | 0.34 |

clinopyroxene mass = 0.66 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.26Mg0.33Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -9567.12 (J) H = -8275.37 (J) S = 1.24 (J/K) V = 0.19 (cc) Cp = 0.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.28 | 1.65 | 26.33 | 70.02 | 9.34 | -5.34 | 8.26 |

clinopyroxene mass = 0.31 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.32Mg0.60Fe'"0.04Ti0.05Al0.21Si1.87O6
G = -4490.17 (J) H = -3870.57 (J) S = 0.59 (J/K) V = 0.09 (cc) Cp = 0.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.31 | 8.38 | 31.69 | 8.69 | 0.40 | 3.56 | 8.96 |

biotite mass = 0.81 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -12720.86 (J) H = -10900.45 (J) S = 1.75 (J/K) V = 0.29 (cc) Cp = 1.01 (J/K)

annite phlogopite
4.37 95.63

feldspar mass = 42.65 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -685007.77 (J) H = -591125.43 (J) S = 90.00 (J/K) V = 16.38 (cc) Cp = 51.99 (J/K)
albite anorthite sanidine
73.08 16.79 10.13

feldspar mass = 2.05 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -31867.05 (J) H = -27449.91 (J) S = 4.23 (J/K) V = 0.80 (cc) Cp = 2.42 (J/K)
albite anorthite sanidine
31.56 1.52 66.92

quartz mass = 27.51 (gm) density = 2.56 (gm/cc)
SiO2
G = -444683.60 (J) H = -387766.84 (J) S = 54.56 (J/K) V = 10.76 (cc) Cp = 31.93 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.10Fe'"0.12Al0.08Ti0.90O3
G = -6105.62 (J) H = -4928.67 (J) S = 1.13 (J/K) V = 0.14 (cc) Cp = 0.58 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.50 6.08 74.74 4.60 4.08

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1005.63 (J) H = -860.29 (J) S = 0.14 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 86.84 (gm) density = 2.73 (gm/cc)
G = -1356836.03 (J) H = -1172656.50 (J) S = 176.56 (J/K) V = 31.82 (cc) Cp = 102.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1568283.25 (J) H = -1347366.93 (J) S = 211.78 (J/K) V = 37.45 (cc) Cp = 120.23 (J/K)

Oxygen delta moles = -0.00175261 delta grams = -0.0560815
G = 405.56 (J) H = -42.43 (J) S = -0.43 (J/K) V = -152.01 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.98 (gm) density = 2.31 (gm/cc) viscosity = 4.00 (log 10 poise) (analysis in wt %)
G = -177275.10 (J) H = -146211.48 (J) S = 30.07 (J/K) V = 4.76 (cc) Cp = 15.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.40 | 0.17 | 11.57 | 0.21 | 0.00 | 0.59 | 0.57 | 0.12 | 0.00 | 0.00 | 2.23 | 4.85 | 4.00 | 0.96 | 8.34 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.64 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.22)3Al2Si3O12
G = -154273.43 (J) H = -131941.05 (J) S = 21.62 (J/K) V = 2.94 (cc) Cp = 12.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.73 | 17.58 | 21.69 |

clinopyroxene mass = 1.06 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.33Mg0.57Fe'"0.04Ti0.04Al0.21Si1.88O6
G = -15333.46 (J) H = -13239.02 (J) S = 2.03 (J/K) V = 0.31 (cc) Cp = 1.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.88 | 8.06 | 33.30 | 8.18 | 0.79 | 3.40 | 9.40 |

biotite mass = 2.03 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -31922.69 (J) H = -27404.71 (J) S = 4.37 (J/K) V = 0.73 (cc) Cp = 2.55 (J/K)

| annite | phlogopite |
|---|---|
| 5.30 | 94.70 |

feldspar mass = 42.20 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.16Al1.16Si2.84O8
G = -676969.29 (J) H = -585421.71 (J) S = 88.61 (J/K) V = 16.21 (cc) Cp = 51.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.17 | 15.77 | 10.06 |

feldspar mass = 2.16 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -33592.96 (J) H = -29000.42 (J) S = 4.45 (J/K) V = 0.85 (cc) Cp = 2.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.52 | 1.38 | 67.10 |

quartz mass = 28.97 (gm) density = 2.56 (gm/cc)
SiO2
G = -467806.32 (J) H = -408765.84 (J) S = 57.15 (J/K) V = 11.33 (cc) Cp = 33.59 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.10Fe'"0.12Al0.08Ti0.90O3
G = -7806.14 (J) H = -6314.52 (J) S = 1.44 (J/K) V = 0.17 (cc) Cp = 0.74 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.66 | 6.18 | 75.79 | 4.52 | 3.84 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1203.75 (J) H = -1032.13 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 88.96 (gm) density = 2.73 (gm/cc)
G = -1388908.03 (J) H = -1203119.39 (J) S = 179.83 (J/K) V = 32.58 (cc) Cp = 104.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1566183.13 (J) H = -1349330.87 (J) S = 209.89 (J/K) V = 37.34 (cc) Cp = 119.98 (J/K)

Oxygen delta moles = -0.00173828 delta grams = -0.0556227

G = 397.99 (J)  H = -41.47 (J)  S = -0.43 (J/K)  V = -149.32 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 750.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.01  delta HM = -5.18  NNO = 0.00  QFM = -0.16  COH = 0.97
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid  mass = 9.44 (gm)  density = 2.29 (gm/cc)  viscosity = 3.50 (log 10 poise)  (analysis in wt %)
G = -152635.13 (J)  H = -125553.73 (J)  S = 26.47 (J/K)  V = 4.13 (cc)  Cp = 13.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.97 | 0.13 | 11.13 | 0.22 | 0.00 | 0.61 | 0.72 | 0.11 | 0.00 | 0.00 | 2.41 | 5.43 | 3.59 | 1.13 | 9.55 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 11.92 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -157212.18 (J)  H = -134729.89 (J)  S = 21.97 (J/K)  V = 3.00 (cc)  Cp = 12.66 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.61 | 18.02 | 20.36 |

clinopyroxene  mass = 1.20 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.30Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -17293.66 (J)  H = -15013.23 (J)  S = 2.23 (J/K)  V = 0.34 (cc)  Cp = 1.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.47 | 1.41 | 28.52 | 69.58 | 10.04 | -5.96 | 8.88 |

biotite  mass = 2.36 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -36996.21 (J)  H = -31821.17 (J)  S = 5.06 (J/K)  V = 0.85 (cc)  Cp = 2.96 (J/K)

| annite | phlogopite |
|---|---|
| 6.07 | 93.93 |

feldspar  mass = 41.67 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.10Na0.75Ca0.15Al1.15Si2.85O8
G = -667658.18 (J)  H = -578621.48 (J)  S = 87.02 (J/K)  V = 16.01 (cc)  Cp = 51.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.93 | 15.28 | 9.79 |

feldspar  mass = 2.94 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -45575.32 (J)  H = -39431.86 (J)  S = 6.00 (J/K)  V = 1.15 (cc)  Cp = 3.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.05 | 1.25 | 67.70 |

quartz  mass = 29.80 (gm)  density = 2.56 (gm/cc)
SiO2
G = -480543.74 (J)  H = -420753.05 (J)  S = 58.44 (J/K)  V = 11.65 (cc)  Cp = 34.50 (J/K)

rhm-oxide  mass = 0.52 (gm)  density = 4.66 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.76Mg0.09Fe'"0.12Al0.07Ti0.90O3
G = -4997.22 (J)  H = -4052.24 (J)  S = 0.92 (J/K)  V = 0.11 (cc)  Cp = 0.47 (J/K)

geikielite hematite ilmenite pyrophanite corundum
9.06 6.16 76.34 4.75 3.69

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1148.01 (J) H = -986.58 (J) S = 0.16 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 90.50 (gm) density = 2.73 (gm/cc)
G = -1411424.53 (J) H = -1225409.50 (J) S = 181.81 (J/K) V = 33.14 (cc) Cp = 106.80 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1564059.66 (J) H = -1350963.23 (J) S = 208.27 (J/K) V = 37.27 (cc) Cp = 120.00 (J/K)

Oxygen delta moles = -0.00180075 delta grams = -0.0576218
G = 407.89 (J) H = -42.33 (J) S = -0.44 (J/K) V = -153.19 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 740.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.17 COH = 0.93
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 8.06 (gm) density = 2.26 (gm/cc) viscosity = 2.96 (log 10 poise) (analysis in wt %)
G = -130663.11 (J) H = -107105.51 (J) S = 23.25 (J/K) V = 3.57 (cc) Cp = 11.44 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O
CO2 SO3 Cl2O-1 F2O-1
62.77 0.10 11.03 0.23 0.00 0.60 0.86 0.09 0.00 0.00 2.71 5.86 3.21 1.41 11.12 0.00 0.00 0.00
0.00

garnet mass = 11.86 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -155848.15 (J) H = -133846.76 (J) S = 21.72 (J/K) V = 2.98 (cc) Cp = 12.57 (J/K)
almandine grossular pyrope
62.18 18.18 19.63

clinopyroxene mass = 1.25 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.29Fe'"0.04Ti0.41Al0.75Si1.24O6
G = -17924.41 (J) H = -15599.43 (J) S = 2.29 (J/K) V = 0.35 (cc) Cp = 1.34 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-14.82 1.26 28.55 72.55 9.84 -6.14 8.76

biotite mass = 2.48 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -38793.98 (J) H = -33440.15 (J) S = 5.28 (J/K) V = 0.89 (cc) Cp = 3.11 (J/K)
annite phlogopite
6.32 93.68

feldspar mass = 41.61 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.75Ca0.15Al1.15Si2.85O8
G = -666015.40 (J) H = -578484.16 (J) S = 86.40 (J/K) V = 15.98 (cc) Cp = 51.68 (J/K)

albite anorthite sanidine
75.33 15.36 9.31

feldspar mass = 3.76 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -58266.61 (J) H = -50524.73 (J) S = 7.64 (J/K) V = 1.48 (cc) Cp = 4.46 (J/K)
albite anorthite sanidine
30.12 1.15 68.73

quartz mass = 30.34 (gm) density = 2.59 (gm/cc)
SiO2
G = -488742.46 (J) H = -429508.29 (J) S = 58.47 (J/K) V = 11.70 (cc) Cp = 40.91 (J/K)

rhm-oxide mass = 0.50 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.77Mg0.09Fe'"0.12Al0.07Ti0.90O3
G = -4817.63 (J) H = -3918.68 (J) S = 0.89 (J/K) V = 0.11 (cc) Cp = 0.46 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.71 5.85 77.09 4.66 3.69

apatite mass = 0.06 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -896.31 (J) H = -772.02 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.07 (J/K)

Total solids mass = 91.88 (gm) density = 2.74 (gm/cc)
G = -1431304.95 (J) H = -1246094.21 (J) S = 182.81 (J/K) V = 33.51 (cc) Cp = 114.59 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1561968.06 (J) H = -1353199.72 (J) S = 206.06 (J/K) V = 37.08 (cc) Cp = 126.03 (J/K)

Oxygen delta moles = -0.00182165 delta grams = -0.0582906
G = 408.17 (J) H = -42.19 (J) S = -0.44 (J/K) V = -153.45 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 730.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.18 COH = 0.89 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 6.40 (gm) density = 2.22 (gm/cc) viscosity = 2.09 (log 10 poise) (analysis in wt %)
G = -104192.88 (J) H = -84721.91 (J) S = 19.41 (J/K) V = 2.89 (cc) Cp = 9.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.45 | 0.07 | 10.81 | 0.24 | 0.00 | 0.62 | 1.09 | 0.08 | 0.00 | 0.00 | 3.38 | 6.65 | 2.62 | 2.03 | 13.96 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.80 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.63Mg0.19)3Al2Si3O12
G = -154574.69 (J) H = -133036.48 (J) S = 21.47 (J/K) V = 2.96 (cc) Cp = 12.47 (J/K)
almandine grossular pyrope
62.75 18.26 18.99

clinopyroxene mass = 1.30 (gm) density = 3.60 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.29Mg0.28Fe'"0.03Ti0.42Al0.78Si1.21O6
G = -18671.20 (J) H = -16289.29 (J) S = 2.37 (J/K) V = 0.36 (cc) Cp = 1.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -16.86 | 1.14 | 28.55 | 75.20 | 9.62 | -6.27 | 8.63 |

biotite mass = 2.59 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -40331.58 (J) H = -34842.17 (J) S = 5.47 (J/K) V = 0.93 (cc) Cp = 3.23 (J/K)

| annite | phlogopite |
|---|---|
| 6.50 | 93.50 |

feldspar mass = 41.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -666039.09 (J) H = -579795.62 (J) S = 85.97 (J/K) V = 15.99 (cc) Cp = 52.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.68 | 15.47 | 8.85 |

feldspar mass = 4.64 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -71822.20 (J) H = -62417.80 (J) S = 9.37 (J/K) V = 1.82 (cc) Cp = 5.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.17 | 1.06 | 69.77 |

quartz mass = 31.04 (gm) density = 2.60 (gm/cc)
SiO2
G = -499286.13 (J) H = -439714.36 (J) S = 59.38 (J/K) V = 11.95 (cc) Cp = 41.48 (J/K)

rhm-oxide mass = 0.49 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.78Mg0.08Fe'"0.11Al0.07Ti0.91O3
G = -4619.67 (J) H = -3769.49 (J) S = 0.85 (J/K) V = 0.10 (cc) Cp = 0.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.38 | 5.53 | 77.96 | 4.41 | 3.71 |

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -367.59 (J) H = -317.33 (J) S = 0.05 (J/K) V = 0.01 (cc) Cp = 0.03 (J/K)

Total solids mass = 93.54 (gm) density = 2.74 (gm/cc)
G = -1455712.15 (J) H = -1270182.54 (J) S = 184.95 (J/K) V = 34.13 (cc) Cp = 116.88 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1559905.03 (J) H = -1354904.45 (J) S = 204.36 (J/K) V = 37.02 (cc) Cp = 126.22 (J/K)

Oxygen delta moles = -0.00184255 delta grams = -0.0589593
G = 408.36 (J) H = -42.03 (J) S = -0.45 (J/K) V = -153.68 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.20 (log 10 poise)  (analysis in wt %)
G = -1697581.57 (J)  H = -1254578.13 (J)  S = 281.60 (J/K)  V = 40.48 (cc)  Cp = 143.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.20 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1697581.57 (J)  H = -1254578.13 (J)  S = 281.60 (J/K)  V = 40.48 (cc)  Cp = 143.05 (J/K)

Oxygen  delta moles = 4.85723e-17  delta grams = 1.55425e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -1694771.07 (J)  H = -1256009.39 (J)  S = 280.69 (J/K)  V = 40.45 (cc)  Cp = 143.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1694771.07 (J)  H = -1256009.39 (J)  S = 280.69 (J/K)  V = 40.45 (cc)  Cp = 143.04 (J/K)

Oxygen  delta moles = 1.80008e-06  delta grams = 5.76004e-05
G = -0.65 (J)  H = 0.08 (J)  S = 0.00 (J/K)  V = 0.23 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.47 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1691969.86 (J)  H = -1257440.68 (J)  S = 279.77 (J/K)  V = 40.42 (cc)  Cp = 143.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.47 (gm/cc)
G = -1691969.86 (J)  H = -1257440.68 (J)  S = 279.77 (J/K)  V = 40.42 (cc)  Cp = 143.03 (J/K)

Oxygen  delta moles = 3.85721e-06  delta grams = 0.000123426
G = -1.39 (J)  H = 0.16 (J)  S = 0.00 (J/K)  V = 0.50 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1689178.00 (J)  H = -1258872.00 (J)  S = 278.85 (J/K)  V = 40.39 (cc)  Cp = 143.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1689178.00 (J)  H = -1258872.00 (J)  S = 278.85 (J/K)  V = 40.39 (cc)  Cp = 143.02 (J/K)

Oxygen  delta moles = 6.17854e-06  delta grams = 0.000197706
G = -2.21 (J)  H = 0.26 (J)  S = 0.00 (J/K)  V = 0.79 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 4.43 (log 10 poise)  (analysis in wt %)
G = -1686395.54 (J)  H = -1260303.36 (J)  S = 277.92 (J/K)  V = 40.36 (cc)  Cp = 143.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1686395.54 (J)  H = -1260303.36 (J)  S = 277.92 (J/K)  V = 40.36 (cc)  Cp = 143.01 (J/K)

Oxygen  delta moles = 8.77152e-06  delta grams = 0.000280678
G = -3.11 (J)  H = 0.37 (J)  S = 0.00 (J/K)  V = 1.12 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1683622.57 (J)  H = -1261734.76 (J)  S = 276.98 (J/K)  V = 40.33 (cc)  Cp = 143.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1683622.57 (J)  H = -1261734.76 (J)  S = 276.98 (J/K)  V = 40.33 (cc)  Cp = 143.00 (J/K)

Oxygen  delta moles = 1.16439e-05  delta grams = 0.000372592
G = -4.10 (J)  H = 0.48 (J)  S = 0.00 (J/K)  V = 1.47 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1240.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.17  COH = 2.08  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -1680859.13 (J) H = -1263166.21 (J) S = 276.04 (J/K) V = 40.30 (cc) Cp = 142.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.56 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1680859.13 (J) H = -1263166.21 (J) S = 276.04 (J/K) V = 40.30 (cc) Cp = 142.99 (J/K)

Oxygen delta moles = 1.48038e-05 delta grams = 0.000473705
G = -5.18 (J) H = 0.61 (J) S = 0.00 (J/K) V = 1.86 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1230.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.16 COH = 2.06 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.48 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1678105.30 (J) H = -1264597.72 (J) S = 275.09 (J/K) V = 40.27 (cc) Cp = 142.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.48 (gm/cc)
G = -1678105.30 (J) H = -1264597.72 (J) S = 275.09 (J/K) V = 40.27 (cc) Cp = 142.99 (J/K)

Oxygen delta moles = 1.82597e-05 delta grams = 0.000584289
G = -6.34 (J) H = 0.74 (J) S = 0.00 (J/K) V = 2.28 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -1675361.14 (J) H = -1266029.29 (J) S = 274.14 (J/K) V = 40.24 (cc) Cp = 142.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.30 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1675361.14 (J) H = -1266029.29 (J) S = 274.14 (J/K) V = 40.24 (cc) Cp = 142.98 (J/K)

Oxygen delta moles = 2.20204e-05 delta grams = 0.000704626
G = -7.59 (J) H = 0.89 (J) S = 0.01 (J/K) V = 2.73 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -1672626.72 (J) H = -1267460.92 (J) S = 273.18 (J/K) V = 40.21 (cc) Cp = 142.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.63 | 0.00 | 3.29 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1672626.72 (J) H = -1267460.92 (J) S = 273.18 (J/K) V = 40.21 (cc) Cp = 142.97 (J/K)

Oxygen delta moles = 2.6095e-05 delta grams = 0.00083501
G = -8.93 (J) H = 1.04 (J) S = 0.01 (J/K) V = 3.22 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1669901.99 (J) H = -1268838.69 (J) S = 272.25 (J/K) V = 40.18 (cc) Cp = 135.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.64 | 0.00 | 3.29 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1669901.99 (J) H = -1268838.69 (J) S = 272.25 (J/K) V = 40.18 (cc) Cp = 135.08 (J/K)

Oxygen delta moles = 3.04933e-05 delta grams = 0.000975748
G = -10.35 (J) H = 1.21 (J) S = 0.01 (J/K) V = 3.73 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1667186.63 (J) H = -1270191.57 (J) S = 271.33 (J/K) V = 40.15 (cc) Cp = 135.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.43 | 13.88 | 0.64 | 0.00 | 3.29 | 0.08 | 1.34 | 0.00 | 0.00 | 2.65 | 4.27 | 1.67 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1667186.63 (J) H = -1270191.57 (J) S = 271.33 (J/K) V = 40.15 (cc) Cp = 135.05 (J/K)

Oxygen delta moles = 3.52251e-05 delta grams = 0.00112716
G = -11.87 (J) H = 1.38 (J) S = 0.01 (J/K) V = 4.29 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1180.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.13 COH = 1.97 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 4.95 (log 10 poise) (analysis in wt %)
G = -1664480.67 (J) H = -1271544.34 (J) S = 270.40 (J/K) V = 40.12 (cc) Cp = 135.02 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.64 0.00 3.29 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1664480.67 (J) H = -1271544.34 (J) S = 270.40 (J/K) V = 40.12 (cc) Cp = 135.02 (J/K)

Oxygen delta moles = 4.03011e-05 delta grams = 0.00128959
G = -13.48 (J) H = 1.57 (J) S = 0.01 (J/K) V = 4.87 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1170.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.12 COH = 1.95 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 5.02 (log 10 poise) (analysis in wt %)
G = -1661784.19 (J) H = -1272896.99 (J) S = 269.47 (J/K) V = 40.09 (cc) Cp = 134.99 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.64 0.00 3.29 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1661784.19 (J) H = -1272896.99 (J) S = 269.47 (J/K) V = 40.09 (cc) Cp = 134.99 (J/K)

Oxygen delta moles = 4.57322e-05 delta grams = 0.00146337
G = -15.18 (J) H = 1.76 (J) S = 0.01 (J/K) V = 5.49 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1160.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.12 COH = 1.93 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1659097.26 (J) H = -1274249.52 (J) S = 268.53 (J/K) V = 40.06 (cc) Cp = 134.96 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

70.61 0.43 13.88 0.64 0.00 3.29 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1659097.26 (J) H = -1274249.52 (J) S = 268.53 (J/K) V = 40.06 (cc) Cp = 134.96 (J/K)

Oxygen delta moles = 5.15298e-05 delta grams = 0.00164889
G = -16.97 (J) H = 1.97 (J) S = 0.01 (J/K) V = 6.14 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1150.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.11 COH = 1.91 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.50 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -1656419.94 (J) H = -1275601.93 (J) S = 267.59 (J/K) V = 40.03 (cc) Cp = 134.93 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.61 0.43 13.88 0.64 0.00 3.28 0.08 1.34 0.00 0.00 2.65 4.27 1.67 0.14 1.00 0.00 0.00 0.00 0.00

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1656419.94 (J) H = -1275601.93 (J) S = 267.59 (J/K) V = 40.03 (cc) Cp = 134.93 (J/K)

Oxygen delta moles = 5.77059e-05 delta grams = 0.00184652
G = -18.85 (J) H = 2.18 (J) S = 0.01 (J/K) V = 6.83 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1140.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.89 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 99.53 (gm) density = 2.50 (gm/cc) viscosity = 5.26 (log 10 poise) (analysis in wt %)
G = -1646713.07 (J) H = -1271649.41 (J) S = 265.41 (J/K) V = 39.84 (cc) Cp = 134.18 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.69 0.43 13.93 0.64 0.00 3.22 0.08 1.24 0.00 0.00 2.66 4.28 1.67 0.14 1.01 0.00 0.00 0.00 0.00

orthopyroxene mass = 0.47 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.57Mg1.33Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -7021.93 (J) H = -5473.03 (J) S = 1.10 (J/K) V = 0.14 (cc) Cp = 0.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.85 | 96.24 | 57.07 | 4.15 | -3.96 | 5.94 | 0.41 |

Total solids mass = 0.47 (gm) density = 3.35 (gm/cc)
G = -7021.93 (J) H = -5473.03 (J) S = 1.10 (J/K) V = 0.14 (cc) Cp = 0.57 (J/K)

Viscosity of the System: 5.26 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1653734.99 (J) H = -1277122.44 (J) S = 266.51 (J/K) V = 39.98 (cc) Cp = 134.75 (J/K)

Oxygen delta moles = 3.13711e-05 delta grams = 0.00100384
G = -10.17 (J) H = 1.17 (J) S = 0.01 (J/K) V = 3.69 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1130.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.87 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 99.12 (gm) density = 2.50 (gm/cc) viscosity = 5.35 (log 10 poise) (analysis in wt %)
G = -1638010.97 (J) H = -1268429.01 (J) S = 263.39 (J/K) V = 39.67 (cc) Cp = 133.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.77 | 0.44 | 13.98 | 0.63 | 0.00 | 3.16 | 0.08 | 1.15 | 0.00 | 0.00 | 2.66 | 4.30 | 1.68 | 0.14 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.88 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.59Mg1.30Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -13050.77 (J) H = -10188.28 (J) S = 2.04 (J/K) V = 0.26 (cc) Cp = 1.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.91 | 96.09 | 59.11 | 4.26 | -4.08 | 6.09 | 0.43 |

Total solids mass = 0.88 (gm) density = 3.36 (gm/cc)
G = -13050.77 (J) H = -10188.28 (J) S = 2.04 (J/K) V = 0.26 (cc) Cp = 1.06 (J/K)

Viscosity of the System: 5.37 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1651061.74 (J) H = -1278617.29 (J) S = 265.43 (J/K) V = 39.93 (cc) Cp = 134.59 (J/K)

Oxygen delta moles = 6.83399e-06 delta grams = 0.000218679
G = -2.20 (J) H = 0.25 (J) S = 0.00 (J/K) V = 0.80 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: felsic

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW

= 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 98.72 (gm) density = 2.50 (gm/cc) viscosity = 5.45 (log 10 poise) (analysis in wt %)
G = -1629507.06 (J) H = -1265334.79 (J) S = 261.40 (J/K) V = 39.51 (cc) Cp = 132.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.85 | 0.44 | 14.03 | 0.62 | 0.00 | 3.09 | 0.08 | 1.06 | 0.00 | 0.00 | 2.67 | 4.32 | 1.69 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.28 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.61Mg1.28Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -18891.18 (J) H = -14771.15 (J) S = 2.96 (J/K) V = 0.38 (cc) Cp = 1.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.01 | 95.93 | 61.20 | 4.39 | -4.20 | 6.25 | 0.44 |

Total solids mass = 1.28 (gm) density = 3.37 (gm/cc)
G = -18891.18 (J) H = -14771.15 (J) S = 2.96 (J/K) V = 0.38 (cc) Cp = 1.55 (J/K)

Viscosity of the System: 5.47 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1648398.24 (J) H = -1280105.94 (J) S = 264.36 (J/K) V = 39.89 (cc) Cp = 134.43 (J/K)

Oxygen delta moles = -1.95065e-05 delta grams = -0.000624185
G = 6.22 (J) H = -0.72 (J) S = -0.00 (J/K) V = -2.26 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1110.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.08 COH = 1.83 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 98.33 (gm) density = 2.50 (gm/cc) viscosity = 5.55 (log 10 poise) (analysis in wt %)
G = -1621187.09 (J) H = -1262356.70 (J) S = 259.43 (J/K) V = 39.35 (cc) Cp = 132.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.92 | 0.44 | 14.07 | 0.61 | 0.00 | 3.02 | 0.08 | 0.98 | 0.00 | 0.00 | 2.68 | 4.34 | 1.69 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.67 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.63Mg1.25Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -24557.41 (J) H = -19232.08 (J) S = 3.85 (J/K) V = 0.49 (cc) Cp = 2.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.16 | 95.78 | 63.32 | 4.52 | -4.34 | 6.41 | 0.46 |

Total solids mass = 1.67 (gm) density = 3.38 (gm/cc)
G = -24557.41 (J) H = -19232.08 (J) S = 3.85 (J/K) V = 0.49 (cc) Cp = 2.02 (J/K)

Viscosity of the System: 5.57 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1645744.50 (J) H = -1281588.78 (J) S = 263.28 (J/K) V = 39.84 (cc) Cp = 134.27 (J/K)

Oxygen delta moles = -4.77338e-05 delta grams = -0.00152742
G = 15.11 (J) H = -1.73 (J) S = -0.01 (J/K) V = -5.49 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1100.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.81 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 97.94 (gm) density = 2.50 (gm/cc) viscosity = 5.65 (log 10 poise) (analysis in wt %)
G = -1613038.43 (J) H = -1259485.78 (J) S = 257.48 (J/K) V = 39.19 (cc) Cp = 131.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.00 | 0.44 | 14.12 | 0.60 | 0.00 | 2.95 | 0.08 | 0.91 | 0.00 | 0.00 | 2.68 | 4.35 | 1.70 | 0.14 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.06 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.65Mg1.23Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -30062.10 (J) H = -23580.40 (J) S = 4.72 (J/K) V = 0.61 (cc) Cp = 2.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.35 | 95.63 | 65.47 | 4.66 | -4.48 | 6.59 | 0.48 |

Total solids mass = 2.06 (gm) density = 3.39 (gm/cc)
G = -30062.10 (J) H = -23580.40 (J) S = 4.72 (J/K) V = 0.61 (cc) Cp = 2.47 (J/K)

Viscosity of the System: 5.68 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1643100.53 (J) H = -1283066.18 (J) S = 262.20 (J/K) V = 39.80 (cc) Cp = 134.11 (J/K)

Oxygen delta moles = -7.79183e-05 delta grams = -0.00249329
G = 24.46 (J) H = -2.80 (J) S = -0.02 (J/K) V = -8.90 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 97.56 (gm) density = 2.50 (gm/cc) viscosity = 5.76 (log 10 poise) (analysis in wt %)
G = -1605050.18 (J) H = -1256714.19 (J) S = 255.54 (J/K) V = 39.04 (cc) Cp = 131.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.08 | 0.44 | 14.16 | 0.59 | 0.00 | 2.87 | 0.08 | 0.84 | 0.00 | 0.00 | 2.69 | 4.37 | 1.71 | 0.14 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.44 (gm) density = 3.41 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.04Fe"0.68Mg1.20Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -35416.18 (J) H = -27824.23 (J) S = 5.57 (J/K) V = 0.72 (cc) Cp = 2.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.57 | 95.48 | 67.64 | 4.82 | -4.63 | 6.78 | 0.49 |

Total solids mass = 2.44 (gm) density = 3.41 (gm/cc)
G = -35416.18 (J) H = -27824.23 (J) S = 5.57 (J/K) V = 0.72 (cc) Cp = 2.92 (J/K)

Viscosity of the System: 5.79 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1640466.35 (J) H = -1284538.42 (J) S = 261.11 (J/K) V = 39.75 (cc) Cp = 133.96 (J/K)

Oxygen delta moles = -0.000110115 delta grams = -0.00352354
G = 34.29 (J) H = -3.92 (J) S = -0.03 (J/K) V = -12.48 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: felsic

T = 1080.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.06 COH = 1.76 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 93.95 (gm) density = 2.50 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -1543311.11 (J) H = -1211125.21 (J) S = 245.49 (J/K) V = 37.59 (cc) Cp = 126.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.93 | 0.46 | 14.25 | 0.59 | 0.00 | 2.85 | 0.09 | 0.77 | 0.00 | 0.00 | 2.69 | 4.39 | 1.77 | 0.15 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.96 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.04Fe"0.70Mg1.17Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -42560.20 (J) H = -33481.92 (J) S = 6.71 (J/K) V = 0.86 (cc) Cp = 3.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.41 | 95.37 | 70.31 | 5.00 | -4.81 | 7.04 | 0.51 |

feldspar mass = 1.67 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.02Na0.70Ca0.27Al1.27Si2.73O8
G = -27982.28 (J) H = -22538.19 (J) S = 4.02 (J/K) V = 0.64 (cc) Cp = 2.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.36 | 27.30 | 2.34 |

quartz mass = 1.43 (gm) density = 2.56 (gm/cc)
SiO2
G = -23981.54 (J) H = -19555.63 (J) S = 3.27 (J/K) V = 0.56 (cc) Cp = 1.71 (J/K)

Total solids mass = 6.05 (gm) density = 2.94 (gm/cc)
G = -94524.02 (J) H = -75575.73 (J) S = 14.00 (J/K) V = 2.06 (cc) Cp = 7.27 (J/K)

Viscosity of the System: 5.90 (log 10 poise)

System mass = 99.99 (gm) density = 2.52 (gm/cc)
G = -1637835.12 (J) H = -1286700.94 (J) S = 259.49 (J/K) V = 39.65 (cc) Cp = 133.44 (J/K)

Oxygen delta moles = -0.00015915 delta grams = -0.00509262
G = 49.15 (J) H = -5.61 (J) S = -0.04 (J/K) V = -17.91 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1070.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.05 COH = 1.74 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 86.12 (gm) density = 2.50 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -1411880.30 (J) H = -1109958.32 (J) S = 224.79 (J/K) V = 34.48 (cc) Cp = 115.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.81 | 0.50 | 14.20 | 0.60 | 0.00 | 2.91 | 0.09 | 0.70 | 0.00 | 0.00 | 2.62 | 4.34 | 1.90 | 0.16 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.67 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.04Fe"0.74Mg1.13Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -52296.03 (J) H = -41174.07 (J) S = 8.28 (J/K) V = 1.07 (cc) Cp = 4.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.61 | 95.48 | 74.17 | 5.12 | -4.91 | 7.26 | 0.50 |

feldspar mass = 6.38 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.27Al1.27Si2.73O8
G = -106982.67 (J) H = -86363.41 (J) S = 15.35 (J/K) V = 2.44 (cc) Cp = 7.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.59 | 26.86 | 2.55 |

quartz mass = 3.82 (gm) density = 2.56 (gm/cc)
SiO2
G = -64047.37 (J) H = -52343.91 (J) S = 8.71 (J/K) V = 1.49 (cc) Cp = 4.56 (J/K)

Total solids mass = 13.87 (gm) density = 2.77 (gm/cc)
G = -223326.08 (J) H = -179881.40 (J) S = 32.35 (J/K) V = 5.01 (cc) Cp = 16.72 (J/K)

Viscosity of the System: 6.06 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1635206.38 (J) H = -1289839.72 (J) S = 257.13 (J/K) V = 39.49 (cc) Cp = 132.31 (J/K)

Oxygen delta moles = -0.000243195 delta grams = -0.00778196
G = 74.49 (J) H = -8.48 (J) S = -0.06 (J/K) V = -27.16 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1060.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.04 COH = 1.72 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 79.33 (gm) density = 2.50 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -1297967.36 (J) H = -1022270.18 (J) S = 206.80 (J/K) V = 31.79 (cc) Cp = 106.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.71 | 0.54 | 14.15 | 0.61 | 0.00 | 2.94 | 0.10 | 0.63 | 0.00 | 0.00 | 2.55 | 4.29 | 2.04 | 0.18 | 1.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.32 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.78Mg1.10Fe"'0.02Ti0.00Al0.13Si1.92O6
G = -60914.18 (J) H = -48002.63 (J) S = 9.68 (J/K) V = 1.25 (cc) Cp = 5.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.66 | 95.59 | 77.87 | 5.23 | -5.01 | 7.48 | 0.50 |

feldspar mass = 10.47 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -175363.44 (J) H = -141885.15 (J) S = 25.11 (J/K) V = 4.01 (cc) Cp = 12.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.78 | 26.46 | 2.75 |

quartz mass = 5.87 (gm) density = 2.56 (gm/cc)
SiO2
G = -98356.14 (J) H = -80562.75 (J) S = 13.35 (J/K) V = 2.29 (cc) Cp = 7.00 (J/K)

Total solids mass = 20.66 (gm) density = 2.73 (gm/cc)
G = -334633.76 (J) H = -270450.53 (J) S = 48.14 (J/K) V = 7.56 (cc) Cp = 24.91 (J/K)

Viscosity of the System: 6.23 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1632601.12 (J) H = -1292720.71 (J) S = 254.95 (J/K) V = 39.34 (cc) Cp = 131.32 (J/K)

Oxygen delta moles = -0.000325928 delta grams = -0.0104293
G = 99.01 (J) H = -11.25 (J) S = -0.08 (J/K) V = -36.13 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1050.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.04 COH = 1.70 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 73.36 (gm) density = 2.49 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -1198303.00 (J) H = -945540.19 (J) S = 191.03 (J/K) V = 29.42 (cc) Cp = 98.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.59 | 14.10 | 0.62 | 0.00 | 2.94 | 0.11 | 0.58 | 0.00 | 0.00 | 2.50 | 4.23 | 2.17 | 0.19 | 1.37 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.92 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.81Mg1.06Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -68615.91 (J) H = -54126.72 (J) S = 10.95 (J/K) V = 1.42 (cc) Cp = 5.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.51 | 95.71 | 81.38 | 5.35 | -5.11 | 7.69 | 0.49 |

feldspar mass = 14.06 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -235074.95 (J) H = -190627.86 (J) S = 33.59 (J/K) V = 5.39 (cc) Cp = 17.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.94 | 26.10 | 2.96 |

quartz mass = 7.66 (gm) density = 2.56 (gm/cc)
SiO2
G = -128023.98 (J) H = -105096.91 (J) S = 17.33 (J/K) V = 2.99 (cc) Cp = 9.12 (J/K)

Total solids mass = 26.63 (gm) density = 2.72 (gm/cc)
G = -431714.85 (J) H = -349851.50 (J) S = 61.87 (J/K) V = 9.80 (cc) Cp = 32.07 (J/K)

Viscosity of the System: 6.41 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1630017.84 (J) H = -1295391.68 (J) S = 252.90 (J/K) V = 39.22 (cc) Cp = 130.43 (J/K)

Oxygen delta moles = -0.000407214 delta grams = -0.0130304
G = 122.67 (J) H = -13.91 (J) S = -0.10 (J/K) V = -44.80 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: felsic

T = 1040.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.03 COH = 1.67 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 68.08 (gm) density = 2.49 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -1110408.74 (J) H = -877857.44 (J) S = 177.09 (J/K) V = 27.33 (cc) Cp = 91.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.52 | 0.63 | 14.06 | 0.62 | 0.00 | 2.92 | 0.12 | 0.53 | 0.00 | 0.00 | 2.45 | 4.17 | 2.31 | 0.21 | 1.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.46 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.85Mg1.03Fe"'0.03Ti0.00Al0.14Si1.92O6
G = -75542.58 (J) H = -59658.45 (J) S = 12.10 (J/K) V = 1.57 (cc) Cp = 6.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.13 | 95.83 | 84.68 | 5.46 | -5.21 | 7.89 | 0.48 |

feldspar mass = 17.22 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.26Al1.26Si2.74O8
G = -287604.88 (J) H = -233755.16 (J) S = 41.01 (J/K) V = 6.60 (cc) Cp = 21.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.07 | 25.77 | 3.17 |

quartz mass = 9.22 (gm) density = 2.56 (gm/cc)
SiO2
G = -153899.19 (J) H = -126618.93 (J) S = 20.77 (J/K) V = 3.60 (cc) Cp = 10.97 (J/K)

Total solids mass = 31.90 (gm) density = 2.71 (gm/cc)

G = -517046.65 (J)  H = -420032.54 (J)  S = 73.88 (J/K)  V = 11.77 (cc)  Cp = 38.57 (J/K)

Viscosity of the System: 6.61 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.56 (gm/cc)
G = -1627455.40 (J)  H = -1297889.99 (J)  S = 250.97 (J/K)  V = 39.10 (cc)  Cp = 129.83 (J/K)

Oxygen  delta moles = -0.000486789  delta grams = -0.0155767
G = 145.41 (J)  H = -16.45 (J)  S = -0.12 (J/K)  V = -53.15 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1030.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.02  COH = 1.65  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 63.38 (gm)  density = 2.49 (gm/cc)  viscosity = 5.81 (log 10 poise)  (analysis in wt %)
G = -1032362.94 (J)  H = -817740.30 (J)  S = 164.70 (J/K)  V = 25.47 (cc)  Cp = 84.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.44 | 0.68 | 14.02 | 0.61 | 0.00 | 2.88 | 0.13 | 0.48 | 0.00 | 0.00 | 2.41 | 4.11 | 2.44 | 0.22 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.97 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.88Mg1.00Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -81794.95 (J)  H = -64677.86 (J)  S = 13.14 (J/K)  V = 1.71 (cc)  Cp = 6.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.51 | 95.95 | 87.74 | 5.57 | -5.30 | 8.08 | 0.48 |

feldspar  mass = 20.04 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.03Na0.71Ca0.25Al1.25Si2.75O8
G = -334115.35 (J)  H = -272174.47 (J)  S = 47.53 (J/K)  V = 7.68 (cc)  Cp = 24.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.16 | 25.46 | 3.37 |

quartz  mass = 10.59 (gm)  density = 2.56 (gm/cc)
SiO2
G = -176639.66 (J)  H = -145650.52 (J)  S = 23.78 (J/K)  V = 4.14 (cc)  Cp = 12.60 (J/K)

Total solids  mass = 36.60 (gm)  density = 2.71 (gm/cc)
G = -592549.96 (J)  H = -482502.85 (J)  S = 84.45 (J/K)  V = 13.53 (cc)  Cp = 44.21 (J/K)

Viscosity of the System: 6.84 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.56 (gm/cc)
G = -1624912.90 (J)  H = -1300243.15 (J)  S = 249.14 (J/K)  V = 39.00 (cc)  Cp = 129.14 (J/K)

Oxygen  delta moles = -0.000564329  delta grams = -0.0180579
G = 167.14 (J)  H = -18.87 (J)  S = -0.14 (J/K)  V = -61.14 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1020.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.01  COH = 1.63  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 59.17 (gm)  density = 2.49 (gm/cc)  viscosity = 5.81 (log 10 poise)  (analysis in wt %)
G = -962668.17 (J)  H = -764034.89 (J)  S = 153.60 (J/K)  V = 23.81 (cc)  Cp = 79.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.36 | 0.72 | 13.99 | 0.61 | 0.00 | 2.82 | 0.14 | 0.44 | 0.00 | 0.00 | 2.37 | 4.05 | 2.57 | 0.24 | 1.70 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.44 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg0.97Fe"'0.03Ti0.00Al0.14Si1.91O6
G = -87446.06 (J)  H = -69242.89 (J)  S = 14.08 (J/K)  V = 1.83 (cc)  Cp = 7.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.62 | 96.06 | 90.57 | 5.67 | -5.39 | 8.25 | 0.47 |

feldspar  mass = 22.56 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -375514.79 (J)  H = -306594.12 (J)  S = 53.30 (J/K)  V = 8.65 (cc)  Cp = 27.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.24 | 25.19 | 3.57 |

quartz  mass = 11.81 (gm)  density = 2.56 (gm/cc)
SiO2
G = -196760.60 (J)  H = -162600.27 (J)  S = 26.42 (J/K)  V = 4.61 (cc)  Cp = 14.05 (J/K)

Total solids  mass = 40.81 (gm)  density = 2.70 (gm/cc)
G = -659721.46 (J)  H = -538437.28 (J)  S = 93.79 (J/K)  V = 15.09 (cc)  Cp = 49.23 (J/K)

Viscosity of the System: 7.11 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.57 (gm/cc)
G = -1622389.63 (J)  H = -1302472.17 (J)  S = 247.39 (J/K)  V = 38.90 (cc)  Cp = 128.51 (J/K)

Oxygen  delta moles = -0.000639494  delta grams = -0.020463
G = 187.79 (J)  H = -21.16 (J)  S = -0.16 (J/K)  V = -68.76 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: felsic

T = 1010.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.00  COH = 1.60  IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 55.39 (gm)  density = 2.48 (gm/cc)  viscosity = 5.81 (log 10 poise)  (analysis in wt %)
G = -900124.01 (J)  H = -715816.56 (J)  S = 143.64 (J/K)  V = 22.31 (cc)  Cp = 74.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.28 | 0.77 | 13.96 | 0.60 | 0.00 | 2.75 | 0.14 | 0.40 | 0.00 | 0.00 | 2.33 | 3.98 | 2.71 | 0.25 | 1.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.86 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.94Fe"'0.03Ti0.00Al0.15Si1.91O6
G = -92551.82 (J) H = -73397.58 (J) S = 14.93 (J/K) V = 1.95 (cc) Cp = 7.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.47 | 96.16 | 93.15 | 5.77 | -5.47 | 8.40 | 0.46 |

feldspar mass = 24.82 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -412535.02 (J) H = -337584.87 (J) S = 58.41 (J/K) V = 9.51 (cc) Cp = 30.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.29 | 24.93 | 3.78 |

quartz mass = 12.91 (gm) density = 2.56 (gm/cc)
SiO2
G = -214674.13 (J) H = -177795.17 (J) S = 28.74 (J/K) V = 5.04 (cc) Cp = 15.33 (J/K)

Total solids mass = 44.59 (gm) density = 2.70 (gm/cc)
G = -719760.98 (J) H = -588777.62 (J) S = 102.08 (J/K) V = 16.50 (cc) Cp = 53.74 (J/K)

Viscosity of the System: 7.46 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1619884.98 (J) H = -1304594.18 (J) S = 245.72 (J/K) V = 38.82 (cc) Cp = 127.94 (J/K)

Oxygen delta moles = -0.000711975 delta grams = -0.0227823
G = 207.27 (J) H = -23.30 (J) S = -0.18 (J/K) V = -75.96 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 1000.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = -0.00 COH = 1.58
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 51.97 (gm) density = 2.48 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -843750.68 (J) H = -672330.98 (J) S = 134.64 (J/K) V = 20.96 (cc) Cp = 69.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.20 | 0.82 | 13.94 | 0.58 | 0.00 | 2.66 | 0.15 | 0.37 | 0.00 | 0.00 | 2.30 | 3.92 | 2.84 | 0.27 | 1.93 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.26 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.95Mg0.92Fe"'0.03Ti0.00Al0.15Si1.91O6
G = -97157.75 (J) H = -77177.41 (J) S = 15.69 (J/K) V = 2.05 (cc) Cp = 8.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.05 | 96.26 | 95.49 | 5.86 | -5.54 | 8.52 | 0.45 |

feldspar mass = 26.86 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.25Al1.25Si2.75O8
G = -445775.67 (J) H = -365614.40 (J) S = 62.96 (J/K) V = 10.29 (cc) Cp = 32.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.33 | 24.70 | 3.97 |

quartz mass = 13.89 (gm) density = 2.56 (gm/cc)
SiO2
G = -230714.34 (J) H = -191500.39 (J) S = 30.80 (J/K) V = 5.42 (cc) Cp = 16.49 (J/K)

Total solids mass = 48.01 (gm) density = 2.70 (gm/cc)
G = -773647.76 (J) H = -634292.20 (J) S = 109.46 (J/K) V = 17.77 (cc) Cp = 57.79 (J/K)

Viscosity of the System: 7.98 (log 10 poise)

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1617398.44 (J) H = -1306623.18 (J) S = 244.10 (J/K) V = 38.74 (cc) Cp = 127.41 (J/K)

Oxygen delta moles = -0.000781522 delta grams = -0.0250078
G = 225.55 (J) H = -25.29 (J) S = -0.20 (J/K) V = -82.73 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 48.87 (gm) density = 2.48 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -792736.31 (J) H = -632953.45 (J) S = 126.50 (J/K) V = 19.74 (cc) Cp = 65.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.13 | 0.87 | 13.92 | 0.57 | 0.00 | 2.56 | 0.16 | 0.34 | 0.00 | 0.00 | 2.28 | 3.85 | 2.98 | 0.29 | 2.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.62 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.90Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -101303.38 (J) H = -80612.71 (J) S = 16.38 (J/K) V = 2.15 (cc) Cp = 8.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.37 | 96.35 | 97.61 | 5.94 | -5.60 | 8.63 | 0.45 |

feldspar mass = 28.71 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.24Al1.24Si2.76O8
G = -475734.87 (J) H = -391071.26 (J) S = 67.03 (J/K) V = 11.00 (cc) Cp = 35.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.35 | 24.48 | 4.17 |

quartz mass = 14.78 (gm) density = 2.56 (gm/cc)
SiO2
G = -245154.97 (J) H = -203933.40 (J) S = 32.63 (J/K) V = 5.77 (cc) Cp = 17.53 (J/K)

Total solids mass = 51.11 (gm) density = 2.70 (gm/cc)
G = -822193.21 (J) H = -675617.37 (J) S = 116.04 (J/K) V = 18.92 (cc) Cp = 61.45 (J/K)

Viscosity of the System: 9.16 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1614929.52 (J) H = -1308570.83 (J) S = 242.54 (J/K) V = 38.66 (cc) Cp = 126.92 (J/K)

Oxygen delta moles = -0.000847959 delta grams = -0.0271337
G = 242.58 (J) H = -27.14 (J) S = -0.21 (J/K) V = -89.05 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 980.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = -0.02 COH = 1.53 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 46.05 (gm) density = 2.47 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -746399.55 (J) H = -597160.00 (J) S = 119.09 (J/K) V = 18.63 (cc) Cp = 61.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.05 | 0.93 | 13.90 | 0.55 | 0.00 | 2.46 | 0.17 | 0.31 | 0.00 | 0.00 | 2.26 | 3.78 | 3.11 | 0.31 | 2.18 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.95 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.88Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -105024.81 (J) H = -83730.86 (J) S = 16.99 (J/K) V = 2.24 (cc) Cp = 9.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.46 | 96.44 | 99.51 | 6.02 | -5.66 | 8.71 | 0.44 |

feldspar mass = 30.39 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.24Al1.24Si2.76O8
G = -502831.11 (J) H = -414282.02 (J) S = 70.66 (J/K) V = 11.64 (cc) Cp = 37.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.35 | 24.28 | 4.36 |

quartz mass = 15.59 (gm) density = 2.56 (gm/cc)
SiO2
G = -258222.32 (J) H = -215274.07 (J) S = 34.27 (J/K) V = 6.09 (cc) Cp = 18.47 (J/K)

Total solids mass = 53.92 (gm) density = 2.70 (gm/cc)
G = -866078.24 (J) H = -713286.95 (J) S = 121.93 (J/K) V = 19.97 (cc) Cp = 64.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1612477.79 (J) H = -1310446.95 (J) S = 241.02 (J/K) V = 38.60 (cc) Cp = 126.47 (J/K)

Oxygen delta moles = -0.00091118 delta grams = -0.0291567
G = 258.38 (J) H = -28.84 (J) S = -0.23 (J/K) V = -94.94 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 970.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = -0.03 COH = 1.50 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 43.47 (gm) density = 2.47 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -704162.67 (J) H = -564506.59 (J) S = 112.34 (J/K) V = 17.61 (cc) Cp = 58.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.96 | 0.98 | 13.88 | 0.53 | 0.00 | 2.35 | 0.18 | 0.29 | 0.00 | 0.00 | 2.24 | 3.71 | 3.24 | 0.32 | 2.31 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.25 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.86Fe"'0.03Ti0.00Al0.15Si1.91O6
G = -108356.13 (J) H = -86557.38 (J) S = 17.54 (J/K) V = 2.31 (cc) Cp = 9.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.32 | 96.51 | 101.22 | 6.09 | -5.71 | 8.77 | 0.43 |

feldspar mass = 31.92 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -527419.17 (J) H = -435523.69 (J) S = 73.92 (J/K) V = 12.23 (cc) Cp = 39.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.35 | 24.10 | 4.56 |

quartz mass = 16.33 (gm) density = 2.56 (gm/cc)
SiO2
G = -270104.85 (J) H = -225672.31 (J) S = 35.74 (J/K) V = 6.38 (cc) Cp = 19.33 (J/K)

Total solids mass = 56.50 (gm) density = 2.70 (gm/cc)
G = -905880.15 (J) H = -747753.37 (J) S = 127.20 (J/K) V = 20.92 (cc) Cp = 67.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1610042.83 (J) H = -1312259.96 (J) S = 239.54 (J/K) V = 38.53 (cc) Cp = 126.04 (J/K)

Oxygen delta moles = -0.000971143 delta grams = -0.0310754
G = 272.94 (J) H = -30.39 (J) S = -0.24 (J/K) V = -100.38 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: felsic

T = 960.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = -0.04 COH = 1.47 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 41.12 (gm) density = 2.47 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -665531.91 (J) H = -534613.92 (J) S = 106.17 (J/K) V = 16.68 (cc) Cp = 55.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.87 | 1.04 | 13.87 | 0.51 | 0.00 | 2.23 | 0.20 | 0.27 | 0.00 | 0.00 | 2.22 | 3.65 | 3.37 | 0.34 | 2.44 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.52 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.84Fe"'0.03Ti0.00Al0.15Si1.91O6
G = -111329.92 (J) H = -89116.46 (J) S = 18.01 (J/K) V = 2.39 (cc) Cp = 9.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.98 | 96.59 | 102.76 | 6.16 | -5.75 | 8.81 | 0.43 |

feldspar mass = 33.33 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -549801.93 (J) H = -455032.89 (J) S = 76.85 (J/K) V = 12.77 (cc) Cp = 40.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.33 | 23.93 | 4.75 |

quartz mass = 17.00 (gm) density = 2.56 (gm/cc)
SiO2
G = -280960.50 (J) H = -235253.85 (J) S = 37.06 (J/K) V = 6.64 (cc) Cp = 20.12 (J/K)

Total solids mass = 58.85 (gm) density = 2.70 (gm/cc)
G = -942092.35 (J) H = -779403.20 (J) S = 131.93 (J/K) V = 21.79 (cc) Cp = 70.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.60 (gm/cc)
G = -1607624.26 (J) H = -1314017.11 (J) S = 238.10 (J/K) V = 38.47 (cc) Cp = 125.64 (J/K)

Oxygen delta moles = -0.00102786 delta grams = -0.0328904
G = 286.30 (J) H = -31.79 (J) S = -0.26 (J/K) V = -105.38 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 950.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = -0.05 COH = 1.45 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 38.56 (gm) density = 2.46 (gm/cc) viscosity = 5.80 (log 10 poise) (analysis in wt %)
G = -624212.15 (J) H = -502437.01 (J) S = 99.56 (J/K) V = 15.69 (cc) Cp = 51.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.90 | 0.92 | 13.88 | 0.48 | 0.00 | 2.08 | 0.20 | 0.25 | 0.00 | 0.00 | 2.20 | 3.59 | 3.52 | 0.36 | 2.60 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.67 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.84Fe"'0.03Ti0.00Al0.15Si1.91O6
G = -112916.32 (J) H = -90602.81 (J) S = 18.24 (J/K) V = 2.42 (cc) Cp = 9.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.80 | 96.63 | 103.60 | 6.16 | -5.79 | 8.78 | 0.42 |

feldspar mass = 34.79 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -572972.16 (J) H = -475279.48 (J) S = 79.87 (J/K) V = 13.32 (cc) Cp = 42.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.18 | 23.82 | 5.01 |

quartz mass = 17.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -293566.21 (J) H = -246343.28 (J) S = 38.61 (J/K) V = 6.95 (cc) Cp = 21.03 (J/K)

rhm-oxide mass = 0.16 (gm) density = 4.61 (gm/cc) (analysis in mole %)

Mn0.03Fe"0.72Mg0.10Fe'''0.18Al0.14Ti0.84O3
G = -1570.21 (J) H = -1196.02 (J) S = 0.31 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.66 | 9.17 | 71.57 | 2.58 | 7.02 |

Total solids mass = 61.40 (gm) density = 2.70 (gm/cc)
G = -981024.90 (J) H = -813421.59 (J) S = 137.03 (J/K) V = 22.73 (cc) Cp = 73.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.60 (gm/cc)
G = -1605237.05 (J) H = -1315858.60 (J) S = 236.58 (J/K) V = 38.42 (cc) Cp = 125.20 (J/K)

Oxygen delta moles = -0.00105417 delta grams = -0.0337321
G = 290.98 (J) H = -32.23 (J) S = -0.26 (J/K) V = -107.20 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 940.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = -0.06 COH = 1.42 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 36.37 (gm) density = 2.45 (gm/cc) viscosity = 5.79 (log 10 poise) (analysis in wt %)
G = -588539.30 (J) H = -474669.07 (J) S = 93.86 (J/K) V = 14.83 (cc) Cp = 48.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.87 | 0.86 | 13.89 | 0.46 | 0.00 | 1.95 | 0.21 | 0.24 | 0.00 | 0.00 | 2.18 | 3.53 | 3.66 | 0.39 | 2.76 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.83 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.83Fe'''0.03Ti0.00Al0.15Si1.91O6
G = -114617.27 (J) H = -92184.43 (J) S = 18.49 (J/K) V = 2.47 (cc) Cp = 9.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.72 | 96.68 | 104.52 | 6.17 | -5.82 | 8.76 | 0.41 |

feldspar mass = 36.06 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -593102.28 (J) H = -493085.56 (J) S = 82.44 (J/K) V = 13.81 (cc) Cp = 43.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.07 | 23.69 | 5.24 |

quartz mass = 18.46 (gm) density = 2.56 (gm/cc)
SiO2
G = -304170.59 (J) H = -255795.34 (J) S = 39.88 (J/K) V = 7.21 (cc) Cp = 21.80 (J/K)

rhm-oxide mass = 0.24 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'''0.18Al0.14Ti0.84O3
G = -2430.17 (J) H = -1856.66 (J) S = 0.47 (J/K) V = 0.05 (cc) Cp = 0.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.49 | 9.06 | 71.88 | 2.69 | 6.88 |

Total solids mass = 63.60 (gm) density = 2.70 (gm/cc)

G = -1014320.30 (J)  H = -842921.99 (J)  S = 141.28 (J/K)  V = 23.54 (cc)  Cp = 76.02 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.97 (gm)  density = 2.61 (gm/cc)
G = -1602859.60 (J)  H = -1317591.06 (J)  S = 235.15 (J/K)  V = 38.37 (cc)  Cp = 124.81 (J/K)

Oxygen  delta moles = -0.0010893  delta grams = -0.0348564
G = 297.95 (J)  H = -32.92 (J)  S = -0.27 (J/K)  V = -109.87 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 930.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.36  delta HM = -5.02  NNO = 0.00  QFM = -0.07  COH = 1.39
IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid  mass = 34.36 (gm)  density = 2.45 (gm/cc)  viscosity = 5.78 (log 10 poise)  (analysis in wt %)
G = -555852.25 (J)  H = -449191.14 (J)  S = 88.65 (J/K)  V = 14.04 (cc)  Cp = 46.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.82 | 0.81 | 13.90 | 0.43 | 0.00 | 1.82 | 0.22 | 0.22 | 0.00 | 0.00 | 2.16 | 3.47 | 3.80 | 0.41 | 2.92 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.97 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.82Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -116092.35 (J)  H = -93595.13 (J)  S = 18.70 (J/K)  V = 2.50 (cc)  Cp = 10.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.54 | 96.73 | 105.33 | 6.19 | -5.86 | 8.74 | 0.41 |

feldspar  mass = 37.24 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -611485.01 (J)  H = -509511.18 (J)  S = 84.76 (J/K)  V = 14.26 (cc)  Cp = 45.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.95 | 23.57 | 5.48 |

quartz  mass = 19.07 (gm)  density = 2.56 (gm/cc)
SiO2
G = -313891.76 (J)  H = -264541.39 (J)  S = 41.02 (J/K)  V = 7.45 (cc)  Cp = 22.51 (J/K)

rhm-oxide  mass = 0.32 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.18Al0.13Ti0.84O3
G = -3175.60 (J)  H = -2433.60 (J)  S = 0.62 (J/K)  V = 0.07 (cc)  Cp = 0.30 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.33 | 8.95 | 72.18 | 2.80 | 6.75 |

Total solids  mass = 65.60 (gm)  density = 2.70 (gm/cc)
G = -1044644.72 (J)  H = -870081.31 (J)  S = 145.09 (J/K)  V = 24.28 (cc)  Cp = 78.33 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.96 (gm)  density = 2.61 (gm/cc)
G = -1600496.97 (J)  H = -1319272.45 (J)  S = 233.74 (J/K)  V = 38.32 (cc)  Cp = 124.44 (J/K)

Oxygen delta moles = -0.00112338 delta grams = -0.0359468
G = 304.46 (J) H = -33.55 (J) S = -0.28 (J/K) V = -112.38 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 920.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = -0.08 COH = 1.36 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 32.49 (gm) density = 2.44 (gm/cc) viscosity = 5.76 (log 10 poise) (analysis in wt %)
G = -525464.10 (J) H = -425442.14 (J) S = 83.83 (J/K) V = 13.31 (cc) Cp = 43.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.82 | 0.77 | 13.82 | 0.41 | 0.00 | 1.68 | 0.23 | 0.21 | 0.00 | 0.00 | 2.16 | 3.45 | 3.93 | 0.43 | 3.09 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.52 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.61Mg0.25)3Al2Si3O12
G = -7032.67 (J) H = -5782.74 (J) S = 1.05 (J/K) V = 0.13 (cc) Cp = 0.56 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.26 | 14.04 | 24.69 |

orthopyroxene mass = 8.75 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.05Mg0.82Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -113005.06 (J) H = -91360.41 (J) S = 18.14 (J/K) V = 2.44 (cc) Cp = 9.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.22 | 96.72 | 105.26 | 6.09 | -5.77 | 8.51 | 0.41 |

feldspar mass = 38.10 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -624728.45 (J) H = -521700.62 (J) S = 86.35 (J/K) V = 14.59 (cc) Cp = 46.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.97 | 23.27 | 5.76 |

quartz mass = 19.72 (gm) density = 2.56 (gm/cc)
SiO2
G = -324093.92 (J) H = -273728.76 (J) S = 42.21 (J/K) V = 7.70 (cc) Cp = 23.25 (J/K)

rhm-oxide mass = 0.38 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.09Fe'"0.17Al0.13Ti0.85O3
G = -3813.33 (J) H = -2931.82 (J) S = 0.74 (J/K) V = 0.08 (cc) Cp = 0.37 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.32 | 8.75 | 72.44 | 2.93 | 6.56 |

Total solids mass = 67.47 (gm) density = 2.70 (gm/cc)
G = -1072673.44 (J) H = -895504.35 (J) S = 148.49 (J/K) V = 24.94 (cc) Cp = 80.45 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1598137.53 (J) H = -1320946.49 (J) S = 232.32 (J/K) V = 38.25 (cc) Cp = 124.07 (J/K)

Oxygen delta moles = -0.00117784 delta grams = -0.0376895
G = 316.28 (J) H = -34.75 (J) S = -0.29 (J/K) V = -116.84 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 910.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = -0.09 COH = 1.34 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 30.74 (gm) density = 2.44 (gm/cc) viscosity = 5.72 (log 10 poise) (analysis in wt %)
G = -497038.33 (J) H = -403156.15 (J) S = 79.35 (J/K) V = 12.62 (cc) Cp = 41.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.87 | 0.73 | 13.64 | 0.38 | 0.00 | 1.53 | 0.24 | 0.20 | 0.00 | 0.00 | 2.15 | 3.48 | 4.06 | 0.46 | 3.26 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.65 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.14Fe"0.61Mg0.25)3Al2Si3O12
G = -22378.66 (J) H = -18450.66 (J) S = 3.32 (J/K) V = 0.42 (cc) Cp = 1.80 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.88 | 14.46 | 24.67 |

orthopyroxene mass = 8.08 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.04Mg0.84Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -104640.40 (J) H = -84875.47 (J) S = 16.71 (J/K) V = 2.26 (cc) Cp = 9.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.41 | 96.63 | 104.02 | 5.82 | -5.52 | 8.05 | 0.41 |

feldspar mass = 38.62 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -632266.42 (J) H = -529146.79 (J) S = 87.16 (J/K) V = 14.79 (cc) Cp = 46.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.16 | 22.72 | 6.12 |

quartz mass = 20.41 (gm) density = 2.56 (gm/cc)
SiO2
G = -335101.89 (J) H = -283634.94 (J) S = 43.50 (J/K) V = 7.97 (cc) Cp = 24.05 (J/K)

rhm-oxide mass = 0.44 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.17Al0.13Ti0.85O3
G = -4355.29 (J) H = -3360.12 (J) S = 0.84 (J/K) V = 0.09 (cc) Cp = 0.42 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.51 | 8.45 | 72.62 | 3.10 | 6.31 |

Total solids mass = 69.22 (gm) density = 2.71 (gm/cc)
G = -1098742.66 (J) H = -919467.97 (J) S = 151.52 (J/K) V = 25.54 (cc) Cp = 82.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1595780.99 (J) H = -1322624.12 (J) S = 230.87 (J/K) V = 38.16 (cc) Cp = 123.67 (J/K)

Oxygen delta moles = -0.00125414 delta grams = -0.0401311
G = 333.64 (J) H = -36.56 (J) S = -0.31 (J/K) V = -123.37 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: felsic

T = 900.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.10 COH = 1.31 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 29.12 (gm) density = 2.43 (gm/cc) viscosity = 5.68 (log 10 poise) (analysis in wt %)
G = -470589.51 (J) H = -382380.82 (J) S = 75.19 (J/K) V = 11.99 (cc) Cp = 39.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.91 | 0.69 | 13.46 | 0.35 | 0.00 | 1.38 | 0.25 | 0.20 | 0.00 | 0.00 | 2.15 | 3.50 | 4.18 | 0.48 | 3.45 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.69 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.60Mg0.25)3Al2Si3O12
G = -36394.73 (J) H = -30087.22 (J) S = 5.38 (J/K) V = 0.68 (cc) Cp = 2.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.46 | 14.89 | 24.66 |

orthopyroxene mass = 7.48 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.86Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -97025.21 (J) H = -78958.02 (J) S = 15.40 (J/K) V = 2.09 (cc) Cp = 8.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.51 | 96.54 | 102.68 | 5.56 | -5.27 | 7.59 | 0.41 |

feldspar mass = 39.11 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.22Al1.22Si2.78O8
G = -639229.43 (J) H = -536138.88 (J) S = 87.87 (J/K) V = 14.98 (cc) Cp = 47.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.34 | 22.18 | 6.49 |

quartz mass = 21.06 (gm) density = 2.56 (gm/cc)
SiO2
G = -345322.54 (J) H = -292912.91 (J) S = 44.67 (J/K) V = 8.23 (cc) Cp = 24.79 (J/K)

rhm-oxide mass = 0.49 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.16Al0.12Ti0.86O3
G = -4830.02 (J) H = -3739.33 (J) S = 0.93 (J/K) V = 0.11 (cc) Cp = 0.46 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.71 | 8.16 | 72.78 | 3.28 | 6.07 |

apatite mass = 0.00 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -51.76 (J) H = -42.94 (J) S = 0.01 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Total solids mass = 70.84 (gm) density = 2.72 (gm/cc)
G = -1122853.69 (J) H = -941879.30 (J) S = 154.26 (J/K) V = 26.09 (cc) Cp = 84.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1593443.20 (J) H = -1324260.12 (J) S = 229.45 (J/K) V = 38.08 (cc) Cp = 123.30 (J/K)

Oxygen delta moles = -0.00132219 delta grams = -0.0423086
G = 348.44 (J) H = -38.07 (J) S = -0.33 (J/K) V = -128.97 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 27.58 (gm) density = 2.42 (gm/cc) viscosity = 5.64 (log 10 poise) (analysis in wt %)
G = -445588.84 (J) H = -362691.63 (J) S = 71.27 (J/K) V = 11.38 (cc) Cp = 37.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.95 | 0.65 | 13.31 | 0.32 | 0.00 | 1.25 | 0.26 | 0.19 | 0.00 | 0.00 | 2.12 | 3.54 | 4.30 | 0.48 | 3.64 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.64 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.15Fe"0.60Mg0.25)3Al2Si3O12
G = -49292.02 (J) H = -40858.85 (J) S = 7.25 (J/K) V = 0.92 (cc) Cp = 3.96 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.02 | 15.32 | 24.66 |

orthopyroxene mass = 6.93 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.87Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -90045.87 (J) H = -73520.77 (J) S = 14.21 (J/K) V = 1.94 (cc) Cp = 7.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.54 | 96.45 | 101.25 | 5.31 | -5.04 | 7.15 | 0.42 |

feldspar mass = 39.57 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -645710.55 (J) H = -542751.35 (J) S = 88.52 (J/K) V = 15.16 (cc) Cp = 48.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.49 | 21.64 | 6.87 |

quartz mass = 21.68 (gm) density = 2.56 (gm/cc)
SiO2
G = -354925.50 (J) H = -301702.53 (J) S = 45.76 (J/K) V = 8.47 (cc) Cp = 25.49 (J/K)

rhm-oxide mass = 0.53 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.16Al0.12Ti0.86O3
G = -5250.92 (J) H = -4079.34 (J) S = 1.01 (J/K) V = 0.11 (cc) Cp = 0.50 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.92 | 7.87 | 72.91 | 3.45 | 5.85 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -309.63 (J) H = -257.46 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 72.38 (gm) density = 2.72 (gm/cc)
G = -1145534.50 (J) H = -963170.30 (J) S = 156.78 (J/K) V = 26.61 (cc) Cp = 85.88 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1591123.33 (J) H = -1325861.93 (J) S = 228.05 (J/K) V = 38.00 (cc) Cp = 122.94 (J/K)

Oxygen delta moles = -0.00138312 delta grams = -0.0442583
G = 361.05 (J) H = -39.33 (J) S = -0.34 (J/K) V = -133.76 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 26.14 (gm) density = 2.42 (gm/cc) viscosity = 5.59 (log 10 poise) (analysis in wt %)
G = -422158.49 (J) H = -344199.57 (J) S = 67.61 (J/K) V = 10.82 (cc) Cp = 35.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.96 | 0.61 | 13.15 | 0.30 | 0.00 | 1.13 | 0.27 | 0.19 | 0.00 | 0.00 | 2.09 | 3.57 | 4.41 | 0.48 | 3.84 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.53 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.60Mg0.25)3Al2Si3O12
G = -61197.27 (J) H = -50863.66 (J) S = 8.96 (J/K) V = 1.15 (cc) Cp = 4.91 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.55 | 15.77 | 24.68 |

orthopyroxene mass = 6.42 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.89Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -83636.00 (J) H = -68513.65 (J) S = 13.11 (J/K) V = 1.80 (cc) Cp = 7.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.48 | 96.35 | 99.72 | 5.06 | -4.80 | 6.73 | 0.42 |

feldspar mass = 40.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.72Ca0.21Al1.21Si2.79O8
G = -651761.33 (J) H = -549025.34 (J) S = 89.09 (J/K) V = 15.33 (cc) Cp = 48.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.62 | 21.11 | 7.28 |

quartz mass = 22.26 (gm) density = 2.56 (gm/cc)
SiO2
G = -363914.86 (J) H = -310003.84 (J) S = 46.75 (J/K) V = 8.69 (cc) Cp = 26.15 (J/K)

rhm-oxide mass = 0.57 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.15Al0.11Ti0.87O3
G = -5621.12 (J) H = -4382.15 (J) S = 1.07 (J/K) V = 0.12 (cc) Cp = 0.53 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.14 | 7.59 | 73.02 | 3.62 | 5.64 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -531.84 (J) H = -443.28 (J) S = 0.08 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 73.81 (gm) density = 2.72 (gm/cc)
G = -1166662.42 (J) H = -983231.93 (J) S = 159.07 (J/K) V = 27.11 (cc) Cp = 87.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1588820.91 (J) H = -1327431.49 (J) S = 226.67 (J/K) V = 37.92 (cc) Cp = 122.60 (J/K)

Oxygen delta moles = -0.00143743 delta grams = -0.0459961
G = 371.66 (J) H = -40.37 (J) S = -0.36 (J/K) V = -137.82 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 870.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.13 COH = 1.22 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 24.78 (gm) density = 2.41 (gm/cc) viscosity = 5.54 (log 10 poise) (analysis in wt %)
G = -400062.95 (J) H = -326719.20 (J) S = 64.16 (J/K) V = 10.28 (cc) Cp = 33.33 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.95 | 0.57 | 13.01 | 0.27 | 0.00 | 1.02 | 0.28 | 0.18 | 0.00 | 0.00 | 2.07 | 3.61 | 4.51 | 0.48 | 4.05 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.34 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.59Mg0.25)3Al2Si3O12
G = -72250.31 (J) H = -60211.70 (J) S = 10.53 (J/K) V = 1.36 (cc) Cp = 5.79 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.06 | 16.23 | 24.71 |

orthopyroxene mass = 5.95 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.91Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -77721.53 (J) H = -63879.94 (J) S = 12.11 (J/K) V = 1.67 (cc) Cp = 6.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.36 | 96.25 | 98.11 | 4.82 | -4.58 | 6.33 | 0.43 |

feldspar mass = 40.42 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.72Ca0.21Al1.21Si2.79O8
G = -657449.01 (J) H = -555015.08 (J) S = 89.61 (J/K) V = 15.49 (cc) Cp = 49.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.72 | 20.58 | 7.70 |

quartz mass = 22.80 (gm) density = 2.56 (gm/cc)
SiO2
G = -372380.71 (J) H = -317890.36 (J) S = 47.67 (J/K) V = 8.91 (cc) Cp = 26.76 (J/K)

rhm-oxide mass = 0.60 (gm) density = 4.62 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.73Mg0.10Fe'''0.15Al0.11Ti0.87O3
G = -5948.04 (J) H = -4653.15 (J) S = 1.13 (J/K) V = 0.13 (cc) Cp = 0.56 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.37 | 7.30 | 73.10 | 3.78 | 5.44 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -722.79 (J) H = -603.87 (J) S = 0.10 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 75.17 (gm) density = 2.73 (gm/cc)
G = -1186472.39 (J) H = -1002254.10 (J) S = 161.15 (J/K) V = 27.57 (cc) Cp = 88.95 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1586535.34 (J) H = -1328973.30 (J) S = 225.31 (J/K) V = 37.85 (cc) Cp = 122.28 (J/K)

Oxygen delta moles = -0.00148589 delta grams = -0.0475467
G = 380.49 (J) H = -41.20 (J) S = -0.37 (J/K) V = -141.23 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 23.49 (gm) density = 2.40 (gm/cc) viscosity = 5.48 (log 10 poise) (analysis in wt %)
G = -379096.38 (J) H = -310087.81 (J) S = 60.90 (J/K) V = 9.77 (cc) Cp = 31.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.90 | 0.54 | 12.87 | 0.25 | 0.00 | 0.93 | 0.29 | 0.18 | 0.00 | 0.00 | 2.05 | 3.65 | 4.59 | 0.49 | 4.27 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.10 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.25)3Al2Si3O12
G = -82571.27 (J) H = -68997.71 (J) S = 11.98 (J/K) V = 1.55 (cc) Cp = 6.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.54 | 16.70 | 24.75 |

orthopyroxene mass = 5.52 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.96Mg0.93Fe'''0.02Ti0.00Al0.11Si1.94O6
G = -72238.30 (J) H = -59570.43 (J) S = 11.18 (J/K) V = 1.55 (cc) Cp = 6.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.17 | 96.15 | 96.43 | 4.59 | -4.36 | 5.94 | 0.43 |

feldspar mass = 40.82 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.72Ca0.20Al1.20Si2.80O8
G = -662834.67 (J) H = -560770.07 (J) S = 90.07 (J/K) V = 15.65 (cc) Cp = 49.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.81 | 20.05 | 8.14 |

quartz mass = 23.32 (gm) density = 2.56 (gm/cc)

SiO2
G = -380401.68 (J)  H = -325426.42 (J)  S = 48.52 (J/K)  V = 9.11 (cc)  Cp = 27.35 (J/K)

rhm-oxide  mass = 0.63 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.14Al0.11Ti0.88O3
G = -6237.85 (J)  H = -4896.85 (J)  S = 1.18 (J/K)  V = 0.14 (cc)  Cp = 0.59 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.62 | 7.03 | 73.16 | 3.95 | 5.26 |

apatite  mass = 0.06 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -885.98 (J)  H = -741.96 (J)  S = 0.13 (J/K)  V = 0.02 (cc)  Cp = 0.07 (J/K)

Total solids  mass = 76.46 (gm)  density = 2.73 (gm/cc)
G = -1205169.76 (J)  H = -1020403.43 (J)  S = 163.06 (J/K)  V = 28.02 (cc)  Cp = 90.37 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.65 (gm/cc)
G = -1584266.14 (J)  H = -1330491.24 (J)  S = 223.96 (J/K)  V = 37.79 (cc)  Cp = 121.98 (J/K)

Oxygen  delta moles = -0.00152917  delta grams = -0.0489317
G = 387.78 (J)  H = -41.86 (J)  S = -0.38 (J/K)  V = -144.07 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: felsic

T = 850.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -12.84  delta HM = -5.08  NNO = 0.00  QFM = -0.15  COH = 1.15  IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid  mass = 22.26 (gm)  density = 2.40 (gm/cc)  viscosity = 5.41 (log 10 poise)  (analysis in wt %)
G = -359076.04 (J)  H = -294160.17 (J)  S = 57.80 (J/K)  V = 9.28 (cc)  Cp = 29.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.82 | 0.50 | 12.73 | 0.23 | 0.00 | 0.84 | 0.30 | 0.18 | 0.00 | 0.00 | 2.03 | 3.69 | 4.67 | 0.50 | 4.50 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 6.82 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -92264.13 (J)  H = -77303.93 (J)  S = 13.32 (J/K)  V = 1.73 (cc)  Cp = 7.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.01 | 17.18 | 24.81 |

orthopyroxene  mass = 5.11 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.95Mg0.95Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -67130.17 (J)  H = -55541.88 (J)  S = 10.32 (J/K)  V = 1.44 (cc)  Cp = 5.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.92 | 96.04 | 94.66 | 4.36 | -4.14 | 5.57 | 0.44 |

feldspar  mass = 41.20 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.72Ca0.20Al1.20Si2.80O8
G = -667974.88 (J)  H = -566336.47 (J)  S = 90.49 (J/K)  V = 15.80 (cc)  Cp = 49.92 (J/K)

albite anorthite sanidine
71.88 19.52 8.60

quartz mass = 23.82 (gm) density = 2.56 (gm/cc)
SiO2
G = -388047.74 (J) H = -332669.52 (J) S = 49.31 (J/K) V = 9.30 (cc) Cp = 27.90 (J/K)

rhm-oxide mass = 0.66 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.14Al0.10Ti0.88O3
G = -6495.73 (J) H = -5117.02 (J) S = 1.23 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.87 6.75 73.19 4.11 5.08

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1024.19 (J) H = -859.72 (J) S = 0.15 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 77.69 (gm) density = 2.73 (gm/cc)
G = -1222936.83 (J) H = -1037828.55 (J) S = 164.81 (J/K) V = 28.44 (cc) Cp = 91.72 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1582012.87 (J) H = -1331988.71 (J) S = 222.61 (J/K) V = 37.72 (cc) Cp = 121.69 (J/K)

Oxygen delta moles = -0.00156788 delta grams = -0.0501702
G = 393.71 (J) H = -42.37 (J) S = -0.39 (J/K) V = -146.41 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 21.06 (gm) density = 2.39 (gm/cc) viscosity = 5.34 (log 10 poise) (analysis in wt %)
G = -339536.51 (J) H = -278564.03 (J) S = 54.77 (J/K) V = 8.80 (cc) Cp = 28.39 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.66 0.47 12.70 0.21 0.00 0.75 0.32 0.17 0.00 0.00 1.98 3.73 4.73 0.51 4.76 0.00 0.00 0.00 0.00

garnet mass = 7.62 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.25)3Al2Si3O12
G = -103062.53 (J) H = -86570.04 (J) S = 14.82 (J/K) V = 1.94 (cc) Cp = 8.25 (J/K)
almandine grossular pyrope
57.69 17.14 25.17

orthopyroxene mass = 4.50 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.97Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -59233.66 (J) H = -49171.57 (J) S = 9.04 (J/K) V = 1.27 (cc) Cp = 5.12 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-94.87 96.08 92.83 4.22 -4.01 5.30 0.44

clinopyroxene mass = 0.25 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.35Mg0.58Fe'"0.05Ti0.05Al0.23Si1.86O6
G = -3670.56 (J) H = -3109.23 (J) S = 0.50 (J/K) V = 0.07 (cc) Cp = 0.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.31 | 10.76 | 34.61 | 9.39 | 0.05 | 4.74 | 9.14 |

feldspar mass = 41.43 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -670570.59 (J) H = -569741.02 (J) S = 90.58 (J/K) V = 15.89 (cc) Cp = 50.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.15 | 18.71 | 9.14 |

quartz mass = 24.34 (gm) density = 2.56 (gm/cc)
SiO2
G = -395942.42 (J) H = -340153.24 (J) S = 50.12 (J/K) V = 9.51 (cc) Cp = 28.48 (J/K)

rhm-oxide mass = 0.67 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.13Al0.10Ti0.89O3
G = -6652.97 (J) H = -5259.60 (J) S = 1.25 (J/K) V = 0.15 (cc) Cp = 0.63 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.17 | 6.46 | 73.13 | 4.26 | 4.98 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1110.01 (J) H = -933.95 (J) S = 0.16 (J/K) V = 0.02 (cc) Cp = 0.09 (J/K)

Total solids mass = 78.89 (gm) density = 2.73 (gm/cc)
G = -1240242.75 (J) H = -1054938.65 (J) S = 166.47 (J/K) V = 28.85 (cc) Cp = 93.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.65 (gm/cc)
G = -1579779.26 (J) H = -1333502.68 (J) S = 221.24 (J/K) V = 37.65 (cc) Cp = 121.41 (J/K)

Oxygen delta moles = -0.00159505 delta grams = -0.0510398
G = 396.59 (J) H = -42.54 (J) S = -0.39 (J/K) V = -147.62 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 830.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.17 COH = 1.09 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 19.89 (gm) density = 2.39 (gm/cc) viscosity = 5.25 (log 10 poise) (analysis in wt %)
G = -320576.18 (J) H = -263373.66 (J) S = 51.85 (J/K) V = 8.33 (cc) Cp = 26.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.44 | 0.44 | 12.67 | 0.20 | 0.00 | 0.68 | 0.33 | 0.17 | 0.00 | 0.00 | 1.94 | 3.78 | 4.78 | 0.53 | 5.04 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.39 (gm) density = 3.93 (gm/cc) (analysis in mole %)

(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -113424.12 (J) H = -95512.69 (J) S = 16.24 (J/K) V = 2.13 (cc) Cp = 9.07 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.38 | 17.03 | 25.59 |

orthopyroxene mass = 3.89 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg1.00Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -51364.26 (J) H = -42780.17 (J) S = 7.78 (J/K) V = 1.10 (cc) Cp = 4.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.80 | 96.15 | 90.95 | 4.10 | -3.89 | 5.06 | 0.44 |

clinopyroxene mass = 0.52 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.33Mg0.59Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -7609.56 (J) H = -6465.10 (J) S = 1.04 (J/K) V = 0.15 (cc) Cp = 0.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.55 | 10.24 | 32.98 | 9.47 | 0.13 | 4.35 | 9.28 |

feldspar mass = 41.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.72Ca0.18Al1.18Si2.82O8
G = -673045.65 (J) H = -573051.94 (J) S = 90.64 (J/K) V = 15.98 (cc) Cp = 50.45 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.41 | 17.88 | 9.71 |

quartz mass = 24.84 (gm) density = 2.56 (gm/cc)
SiO2
G = -403591.36 (J) H = -347453.22 (J) S = 50.89 (J/K) V = 9.70 (cc) Cp = 29.03 (J/K)

rhm-oxide mass = 0.69 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.12Al0.10Ti0.89O3
G = -6777.76 (J) H = -5377.35 (J) S = 1.27 (J/K) V = 0.15 (cc) Cp = 0.64 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.48 | 6.18 | 73.04 | 4.42 | 4.88 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1172.18 (J) H = -988.57 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 80.06 (gm) density = 2.74 (gm/cc)
G = -1256984.89 (J) H = -1071629.04 (J) S = 168.02 (J/K) V = 29.25 (cc) Cp = 94.31 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1577561.07 (J) H = -1335002.70 (J) S = 219.88 (J/K) V = 37.58 (cc) Cp = 121.15 (J/K)

Oxygen delta moles = -0.00161894 delta grams = -0.0518043
G = 398.53 (J) H = -42.60 (J) S = -0.40 (J/K) V = -148.49 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06
IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 18.75 (gm) density = 2.38 (gm/cc) viscosity = 5.16 (log 10 poise) (analysis in wt %)
G = -302095.26 (J) H = -248507.82 (J) S = 49.02 (J/K) V = 7.87 (cc) Cp = 25.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.19 | 0.41 | 12.65 | 0.18 | 0.00 | 0.61 | 0.35 | 0.17 | 0.00 | 0.00 | 1.90 | 3.83 | 4.81 | 0.56 | 5.35 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.12 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -123245.76 (J) H = -104043.32 (J) S = 17.57 (J/K) V = 2.32 (cc) Cp = 9.86 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.06 | 16.91 | 26.03 |

orthopyroxene mass = 3.30 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.89Mg1.02Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -43813.79 (J) H = -36611.80 (J) S = 6.59 (J/K) V = 0.94 (cc) Cp = 3.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.71 | 96.21 | 89.03 | 3.98 | -3.78 | 4.82 | 0.45 |

clinopyroxene mass = 0.78 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.31Mg0.60Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -11428.27 (J) H = -9738.07 (J) S = 1.55 (J/K) V = 0.23 (cc) Cp = 0.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.72 | 9.74 | 31.38 | 9.57 | 0.22 | 3.96 | 9.41 |

feldspar mass = 41.89 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -675685.22 (J) H = -576513.92 (J) S = 90.72 (J/K) V = 16.08 (cc) Cp = 50.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.61 | 17.07 | 10.32 |

quartz mass = 25.33 (gm) density = 2.56 (gm/cc)
SiO2
G = -410994.25 (J) H = -354567.81 (J) S = 51.62 (J/K) V = 9.89 (cc) Cp = 29.57 (J/K)

rhm-oxide mass = 0.70 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.12Al0.10Ti0.89O3
G = -6880.57 (J) H = -5478.31 (J) S = 1.28 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.80 | 5.91 | 72.93 | 4.56 | 4.80 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1214.51 (J) H = -1026.66 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 81.20 (gm) density = 2.74 (gm/cc)
G = -1273262.36 (J) H = -1087979.87 (J) S = 169.49 (J/K) V = 29.64 (cc) Cp = 95.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1575357.62 (J) H = -1336487.69 (J) S = 218.52 (J/K) V = 37.51 (cc) Cp = 120.91 (J/K)

Oxygen delta moles = -0.00164076 delta grams = -0.0525024
G = 399.85 (J) H = -42.60 (J) S = -0.40 (J/K) V = -149.13 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 17.62 (gm) density = 2.37 (gm/cc) viscosity = 5.04 (log 10 poise) (analysis in wt %)
G = -283963.42 (J) H = -233859.98 (J) S = 46.26 (J/K) V = 7.42 (cc) Cp = 23.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.88 | 0.37 | 12.63 | 0.16 | 0.00 | 0.55 | 0.36 | 0.17 | 0.00 | 0.00 | 1.88 | 3.89 | 4.82 | 0.59 | 5.69 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.81 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -132603.45 (J) H = -112222.89 (J) S = 18.82 (J/K) V = 2.50 (cc) Cp = 10.60 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.73 | 16.78 | 26.49 |

orthopyroxene mass = 2.74 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.04Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -36534.57 (J) H = -30629.22 (J) S = 5.45 (J/K) V = 0.78 (cc) Cp = 3.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.58 | 96.27 | 87.07 | 3.85 | -3.66 | 4.60 | 0.45 |

clinopyroxene mass = 1.03 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.30Mg0.61Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -15144.08 (J) H = -12941.83 (J) S = 2.03 (J/K) V = 0.31 (cc) Cp = 1.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.81 | 9.27 | 29.81 | 9.68 | 0.31 | 3.58 | 9.54 |

feldspar mass = 42.14 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.73Ca0.16Al1.16Si2.84O8
G = -678507.71 (J) H = -580143.54 (J) S = 90.81 (J/K) V = 16.18 (cc) Cp = 51.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.76 | 16.29 | 10.96 |

quartz mass = 25.81 (gm) density = 2.56 (gm/cc)
SiO2
G = -418215.28 (J) H = -361551.08 (J) S = 52.31 (J/K) V = 10.08 (cc) Cp = 30.09 (J/K)

rhm-oxide mass = 0.71 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -6963.33 (J) H = -5563.82 (J) S = 1.29 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.14 | 5.64 | 72.79 | 4.70 | 4.72 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -1236.90 (J)  H = -1048.02 (J)  S = 0.17 (J/K)  V = 0.03 (cc)  Cp = 0.10 (J/K)

Total solids  mass = 82.32 (gm)  density = 2.74 (gm/cc)
G = -1289205.33 (J)  H = -1104100.40 (J)  S = 170.90 (J/K)  V = 30.03 (cc)  Cp = 96.81 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.95 (gm)  density = 2.67 (gm/cc)
G = -1573168.75 (J)  H = -1337960.38 (J)  S = 217.15 (J/K)  V = 37.45 (cc)  Cp = 120.68 (J/K)

Oxygen  delta moles = -0.0016608  delta grams = -0.0531436
G = 400.64 (J)  H = -42.54 (J)  S = -0.41 (J/K)  V = -149.57 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 800.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -13.87  delta HM = -5.13  NNO = 0.00  QFM = -0.20  COH = 0.99
IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid  mass = 16.49 (gm)  density = 2.37 (gm/cc)  viscosity = 4.89 (log 10 poise)  (analysis in wt %)
G = -265543.84 (J)  H = -218870.13 (J)  S = 43.49 (J/K)  V = 6.96 (cc)  Cp = 22.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.52 | 0.34 | 12.51 | 0.16 | 0.00 | 0.51 | 0.41 | 0.16 | 0.00 | 0.00 | 1.87 | 4.02 | 4.79 | 0.63 | 6.08 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.33 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.57Mg0.27)3Al2Si3O12
G = -139459.89 (J)  H = -118303.77 (J)  S = 19.71 (J/K)  V = 2.63 (cc)  Cp = 11.16 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.72 | 16.68 | 26.59 |

orthopyroxene  mass = 2.58 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.86Mg1.05Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -34335.82 (J)  H = -28868.45 (J)  S = 5.09 (J/K)  V = 0.73 (cc)  Cp = 2.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.58 | 96.35 | 86.17 | 3.73 | -3.55 | 4.41 | 0.45 |

clinopyroxene  mass = 0.49 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.29Mg0.62Fe'"0.04Ti0.05Al0.23Si1.87O6
G = -7194.53 (J)  H = -6164.55 (J)  S = 0.96 (J/K)  V = 0.15 (cc)  Cp = 0.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.29 | 8.90 | 28.85 | 9.53 | 0.42 | 3.28 | 9.73 |

clinopyroxene  mass = 0.87 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.24Mg0.36Fe'"0.04Ti0.39Al0.71Si1.28O6
G = -12620.84 (J)  H = -10849.21 (J)  S = 1.65 (J/K)  V = 0.24 (cc)  Cp = 0.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.32 | 2.00 | 24.14 | 68.36 | 9.80 | -6.05 | 9.06 |

feldspar  mass = 42.27 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)

K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -679316.16 (J) H = -582045.52 (J) S = 90.64 (J/K) V = 16.24 (cc) Cp = 51.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.93 | 15.33 | 11.74 |

quartz mass = 26.33 (gm) density = 2.56 (gm/cc)
SiO2
G = -426263.36 (J) H = -369275.98 (J) S = 53.10 (J/K) V = 10.29 (cc) Cp = 30.68 (J/K)

rhm-oxide mass = 0.51 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -5002.98 (J) H = -4010.26 (J) S = 0.93 (J/K) V = 0.11 (cc) Cp = 0.47 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.28 | 5.48 | 72.61 | 5.03 | 4.60 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1243.27 (J) H = -1055.86 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 83.46 (gm) density = 2.74 (gm/cc)
G = -1305436.85 (J) H = -1120573.61 (J) S = 172.26 (J/K) V = 30.42 (cc) Cp = 98.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.67 (gm/cc)
G = -1570980.69 (J) H = -1339443.73 (J) S = 215.75 (J/K) V = 37.38 (cc) Cp = 120.48 (J/K)

Oxygen delta moles = -0.00170555 delta grams = -0.0545757
G = 407.24 (J) H = -43.08 (J) S = -0.42 (J/K) V = -152.18 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 15.19 (gm) density = 2.36 (gm/cc) viscosity = 4.67 (log 10 poise) (analysis in wt %)
G = -244684.70 (J) H = -201729.70 (J) S = 40.40 (J/K) V = 6.44 (cc) Cp = 20.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.03 | 0.30 | 12.36 | 0.15 | 0.00 | 0.48 | 0.47 | 0.16 | 0.00 | 0.00 | 1.88 | 4.24 | 4.64 | 0.68 | 6.60 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.84 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.16Fe"0.57Mg0.27)3Al2Si3O12
G = -146156.15 (J) H = -124273.76 (J) S = 20.58 (J/K) V = 2.76 (cc) Cp = 11.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.74 | 16.49 | 26.77 |

orthopyroxene mass = 2.39 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.06Fe'"0.01Ti0.00Al0.08Si1.96O6
G = -31870.31 (J) H = -26872.51 (J) S = 4.70 (J/K) V = 0.68 (cc) Cp = 2.74 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-86.56 96.46 85.22 3.63 -3.45 4.24 0.45

clinopyroxene mass = 1.69 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.24Mg0.36Fe'"0.04Ti0.40Al0.72Si1.27O6
G = -24678.11 (J) H = -21266.47 (J) S = 3.21 (J/K) V = 0.48 (cc) Cp = 1.84 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-7.44 1.91 23.60 69.17 9.95 -6.45 9.27

feldspar mass = 41.85 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -671647.81 (J) H = -576702.08 (J) S = 89.31 (J/K) V = 16.09 (cc) Cp = 50.84 (J/K)
albite anorthite sanidine
73.42 14.58 12.00

feldspar mass = 0.66 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -10309.60 (J) H = -8837.79 (J) S = 1.38 (J/K) V = 0.26 (cc) Cp = 0.78 (J/K)
albite anorthite sanidine
33.83 1.68 64.49

quartz mass = 26.92 (gm) density = 2.56 (gm/cc)
SiO2
G = -435128.46 (J) H = -377738.18 (J) S = 53.98 (J/K) V = 10.51 (cc) Cp = 31.32 (J/K)

rhm-oxide mass = 0.31 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.72Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -3088.67 (J) H = -2483.76 (J) S = 0.57 (J/K) V = 0.07 (cc) Cp = 0.29 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.43 5.31 72.39 5.36 4.50

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1244.54 (J) H = -1059.38 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 84.76 (gm) density = 2.75 (gm/cc)
G = -1324123.65 (J) H = -1139233.93 (J) S = 173.91 (J/K) V = 30.87 (cc) Cp = 99.60 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1568808.35 (J) H = -1340963.63 (J) S = 214.31 (J/K) V = 37.31 (cc) Cp = 120.29 (J/K)

Oxygen delta moles = -0.00174747 delta grams = -0.0559169
G = 412.95 (J) H = -43.53 (J) S = -0.43 (J/K) V = -154.46 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 780.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.23 COH = 0.92
IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 13.02 (gm) density = 2.34 (gm/cc) viscosity = 4.34 (log 10 poise) (analysis in wt %)
G = -209874.76 (J) H = -172890.21 (J) S = 35.12 (J/K) V = 5.56 (cc) Cp = 17.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.51 | 0.24 | 11.90 | 0.16 | 0.00 | 0.50 | 0.51 | 0.15 | 0.00 | 0.00 | 1.92 | 4.73 | 4.31 | 0.75 | 7.32 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.66 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.26)3Al2Si3O12
G = -169748.02 (J) H = -144618.53 (J) S = 23.86 (J/K) V = 3.21 (cc) Cp = 13.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.71 | 16.69 | 25.59 |

clinopyroxene mass = 0.95 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.24Mg0.35Fe'"0.04Ti0.39Al0.71Si1.28O6
G = -13805.36 (J) H = -11919.51 (J) S = 1.79 (J/K) V = 0.27 (cc) Cp = 1.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.82 | 1.80 | 24.30 | 68.55 | 10.36 | -6.84 | 9.66 |

clinopyroxene mass = 0.83 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.29Mg0.62Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -12211.07 (J) H = -10511.13 (J) S = 1.61 (J/K) V = 0.25 (cc) Cp = 0.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.42 | 8.27 | 28.51 | 8.91 | 0.80 | 2.78 | 10.31 |

biotite mass = 1.14 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -18077.64 (J) H = -15459.50 (J) S = 2.49 (J/K) V = 0.41 (cc) Cp = 1.44 (J/K)

| annite | phlogopite |
|---|---|
| 3.22 | 96.78 |

feldspar mass = 41.46 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.74Ca0.14Al1.14Si2.86O8
G = -664423.03 (J) H = -571726.59 (J) S = 88.02 (J/K) V = 15.94 (cc) Cp = 50.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.38 | 13.79 | 11.83 |

feldspar mass = 0.97 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.02Al1.02Si2.98O8
G = -15166.22 (J) H = -13030.01 (J) S = 2.03 (J/K) V = 0.38 (cc) Cp = 1.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.64 | 1.51 | 64.85 |

quartz mass = 28.29 (gm) density = 2.56 (gm/cc)
SiO2
G = -456831.36 (J) H = -397398.89 (J) S = 56.43 (J/K) V = 11.05 (cc) Cp = 32.88 (J/K)

rhm-oxide mass = 0.52 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -5076.87 (J) H = -4091.95 (J) S = 0.94 (J/K) V = 0.11 (cc) Cp = 0.48 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.80 | 5.34 | 73.31 | 5.27 | 4.27 |

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -1467.86 (J)  H = -1252.36 (J)  S = 0.20 (J/K)  V = 0.03 (cc)  Cp = 0.11 (J/K)

Total solids  mass = 86.92 (gm)  density = 2.75 (gm/cc)
G = -1356807.43 (J)  H = -1170008.46 (J)  S = 177.37 (J/K)  V = 31.66 (cc)  Cp = 102.12 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.69 (gm/cc)
G = -1566682.20 (J)  H = -1342898.67 (J)  S = 212.49 (J/K)  V = 37.21 (cc)  Cp = 119.95 (J/K)

Oxygen  delta moles = -0.0017316  delta grams = -0.0554091
G = 404.95 (J)  H = -42.52 (J)  S = -0.42 (J/K)  V = -151.62 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 770.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -14.54  delta HM = -5.16  NNO = 0.00  QFM = -0.24  COH = 0.88
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid  mass = 11.51 (gm)  density = 2.33 (gm/cc)  viscosity = 3.99 (log 10 poise)  (analysis in wt %)
G = -185675.12 (J)  H = -152785.24 (J)  S = 31.53 (J/K)  V = 4.94 (cc)  Cp = 15.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.62 | 0.20 | 11.62 | 0.17 | 0.00 | 0.50 | 0.63 | 0.13 | 0.00 | 0.00 | 2.00 | 5.13 | 4.01 | 0.84 | 8.15 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 12.80 (gm)  density = 3.95 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -170806.86 (J)  H = -145808.48 (J)  S = 23.96 (J/K)  V = 3.24 (cc)  Cp = 13.71 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.73 | 17.08 | 24.19 |

clinopyroxene  mass = 1.88 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.25Mg0.34Fe'"0.03Ti0.40Al0.72Si1.27O6
G = -27221.28 (J)  H = -23551.13 (J)  S = 3.52 (J/K)  V = 0.53 (cc)  Cp = 2.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.49 | 1.63 | 25.03 | 69.60 | 10.52 | -7.08 | 9.79 |

biotite  mass = 1.47 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -23288.50 (J)  H = -19957.41 (J)  S = 3.19 (J/K)  V = 0.53 (cc)  Cp = 1.86 (J/K)

| annite | phlogopite |
|---|---|
| 3.64 | 96.36 |

feldspar  mass = 40.98 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.11Na0.75Ca0.14Al1.14Si2.86O8
G = -656034.50 (J)  H = -565754.79 (J)  S = 86.55 (J/K)  V = 15.75 (cc)  Cp = 50.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.07 | 13.51 | 11.42 |

feldspar  mass = 1.86 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)

K0.66Na0.33Ca0.01Al1.01Si2.99O8
G = -28927.92 (J) H = -24908.93 (J) S = 3.85 (J/K) V = 0.73 (cc) Cp = 2.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.96 | 1.38 | 65.67 |

quartz mass = 29.03 (gm) density = 2.56 (gm/cc)
SiO2
G = -468156.66 (J) H = -408090.28 (J) S = 57.58 (J/K) V = 11.34 (cc) Cp = 33.70 (J/K)

rhm-oxide mass = 0.30 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.74Mg0.11Fe'"0.11Al0.08Ti0.91O3
G = -2943.41 (J) H = -2378.09 (J) S = 0.54 (J/K) V = 0.07 (cc) Cp = 0.28 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.12 | 5.30 | 73.87 | 5.56 | 4.15 |

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1487.53 (J) H = -1272.06 (J) S = 0.21 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

Total solids mass = 88.43 (gm) density = 2.74 (gm/cc)
G = -1378866.67 (J) H = -1191721.18 (J) S = 179.40 (J/K) V = 32.22 (cc) Cp = 103.98 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1564541.80 (J) H = -1344506.42 (J) S = 210.93 (J/K) V = 37.16 (cc) Cp = 119.85 (J/K)

Oxygen delta moles = -0.00177653 delta grams = -0.0568469
G = 411.10 (J) H = -43.01 (J) S = -0.44 (J/K) V = -154.08 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 760.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.25 COH = 0.84 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.20 (gm) density = 2.31 (gm/cc) viscosity = 3.63 (log 10 poise) (analysis in wt %)
G = -164729.49 (J) H = -135372.97 (J) S = 28.41 (J/K) V = 4.41 (cc) Cp = 14.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.36 | 0.17 | 11.61 | 0.17 | 0.00 | 0.49 | 0.71 | 0.11 | 0.00 | 0.00 | 2.13 | 5.39 | 3.75 | 0.97 | 9.14 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.71 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -168875.84 (J) H = -144461.86 (J) S = 23.63 (J/K) V = 3.21 (cc) Cp = 13.58 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.42 | 17.29 | 23.29 |

clinopyroxene mass = 1.91 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.25Mg0.32Fe'"0.03Ti0.41Al0.75Si1.25O6
G = -27626.74 (J) H = -23959.10 (J) S = 3.55 (J/K) V = 0.53 (cc) Cp = 2.06 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-11.78 1.46 25.22 72.25 10.38 -7.23 9.69

biotite mass = 1.64 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -25790.57 (J) H = -22150.36 (J) S = 3.52 (J/K) V = 0.59 (cc) Cp = 2.06 (J/K)
annite phlogopite
3.83 96.17

feldspar mass = 40.83 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.76Ca0.14Al1.14Si2.86O8
G = -653031.20 (J) H = -564430.52 (J) S = 85.76 (J/K) V = 15.69 (cc) Cp = 50.13 (J/K)
albite anorthite sanidine
75.53 13.61 10.86

feldspar mass = 2.74 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -42567.59 (J) H = -36735.89 (J) S = 5.64 (J/K) V = 1.08 (cc) Cp = 3.25 (J/K)
albite anorthite sanidine
31.94 1.26 66.80

quartz mass = 29.53 (gm) density = 2.60 (gm/cc)
SiO2
G = -475602.64 (J) H = -416204.72 (J) S = 57.49 (J/K) V = 11.36 (cc) Cp = 39.78 (J/K)

rhm-oxide mass = 0.29 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.75Mg0.11Fe"'0.10Al0.08Ti0.91O3
G = -2805.10 (J) H = -2272.92 (J) S = 0.52 (J/K) V = 0.06 (cc) Cp = 0.26 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.67 5.07 74.55 5.55 4.15

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1398.77 (J) H = -1198.89 (J) S = 0.19 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

Total solids mass = 89.74 (gm) density = 2.76 (gm/cc)
G = -1397698.45 (J) H = -1211414.26 (J) S = 180.31 (J/K) V = 32.55 (cc) Cp = 111.23 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.70 (gm/cc)
G = -1562427.94 (J) H = -1346787.23 (J) S = 208.72 (J/K) V = 36.96 (cc) Cp = 125.41 (J/K)

Oxygen delta moles = -0.00179347 delta grams = -0.0573888
G = 410.62 (J) H = -42.79 (J) S = -0.44 (J/K) V = -154.06 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 8.76 (gm) density = 2.29 (gm/cc) viscosity = 3.13 (log 10 poise) (analysis in wt %)
G = -141845.32 (J) H = -116217.02 (J) S = 25.05 (J/K) V = 3.82 (cc) Cp = 12.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.36 | 0.14 | 11.61 | 0.17 | 0.00 | 0.48 | 0.83 | 0.10 | 0.00 | 0.00 | 2.35 | 5.81 | 3.40 | 1.19 | 10.57 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.62 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.60Mg0.22)3Al2Si3O12
G = -167022.34 (J) H = -143175.92 (J) S = 23.31 (J/K) V = 3.18 (cc) Cp = 13.44 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.09 | 17.44 | 22.47 |

clinopyroxene mass = 1.95 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.89Fe"0.25Mg0.31Fe'"0.03Ti0.42Al0.77Si1.23O6
G = -28139.64 (J) H = -24461.81 (J) S = 3.59 (J/K) V = 0.54 (cc) Cp = 2.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.79 | 1.32 | 25.39 | 74.61 | 10.22 | -7.34 | 9.58 |

biotite mass = 1.78 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -28016.29 (J) H = -24115.17 (J) S = 3.81 (J/K) V = 0.64 (cc) Cp = 2.24 (J/K)

| annite | phlogopite |
|---|---|
| 3.99 | 96.01 |

feldspar mass = 40.74 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.76Ca0.14Al1.14Si2.86O8
G = -650839.83 (J) H = -563799.72 (J) S = 85.07 (J/K) V = 15.64 (cc) Cp = 50.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.96 | 13.73 | 10.31 |

feldspar mass = 3.64 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -56332.28 (J) H = -48723.77 (J) S = 7.44 (J/K) V = 1.43 (cc) Cp = 4.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.91 | 1.16 | 67.93 |

quartz mass = 30.10 (gm) density = 2.60 (gm/cc)
SiO2
G = -484265.07 (J) H = -424700.31 (J) S = 58.22 (J/K) V = 11.56 (cc) Cp = 40.21 (J/K)

rhm-oxide mass = 0.27 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.10Fe'"0.10Al0.08Ti0.91O3
G = -2654.24 (J) H = -2157.04 (J) S = 0.49 (J/K) V = 0.06 (cc) Cp = 0.25 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.24 | 4.84 | 75.27 | 5.47 | 4.18 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1225.12 (J) H = -1052.45 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 91.18 (gm) density = 2.76 (gm/cc)
G = -1418494.81 (J) H = -1232186.19 (J) S = 182.09 (J/K) V = 33.09 (cc) Cp = 112.99 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.71 (gm/cc)
G = -1560340.13 (J) H = -1348403.21 (J) S = 207.14 (J/K) V = 36.91 (cc) Cp = 125.32 (J/K)

Oxygen delta moles = -0.0018097 delta grams = -0.0579083
G = 409.92 (J) H = -42.54 (J) S = -0.44 (J/K) V = -153.95 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 740.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.28 COH = 0.76
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 7.22 (gm) density = 2.26 (gm/cc) viscosity = 2.43 (log 10 poise) (analysis in wt %)
G = -117330.05 (J) H = -95583.45 (J) S = 21.46 (J/K) V = 3.20 (cc) Cp = 10.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.13 | 0.10 | 11.56 | 0.17 | 0.00 | 0.48 | 1.02 | 0.09 | 0.00 | 0.00 | 2.76 | 6.42 | 2.92 | 1.59 | 12.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.54 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.22)3Al2Si3O12
G = -165390.70 (J) H = -142075.83 (J) S = 23.01 (J/K) V = 3.16 (cc) Cp = 13.33 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.71 | 17.50 | 21.79 |

clinopyroxene mass = 2.00 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.25Mg0.30Fe'"0.03Ti0.43Al0.79Si1.21O6
G = -28824.72 (J) H = -25116.49 (J) S = 3.66 (J/K) V = 0.56 (cc) Cp = 2.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.47 | 1.21 | 25.49 | 76.67 | 10.05 | -7.43 | 9.48 |

biotite mass = 1.90 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -29808.73 (J) H = -25715.43 (J) S = 4.04 (J/K) V = 0.68 (cc) Cp = 2.38 (J/K)

| annite | phlogopite |
|---|---|
| 4.09 | 95.91 |

feldspar mass = 40.73 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.76Ca0.14Al1.14Si2.86O8
G = -649984.59 (J) H = -564322.25 (J) S = 84.55 (J/K) V = 15.63 (cc) Cp = 50.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.37 | 13.85 | 9.79 |

feldspar mass = 4.52 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -69886.80 (J) H = -60582.79 (J) S = 9.18 (J/K) V = 1.77 (cc) Cp = 5.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.91 | 1.06 | 69.03 |

quartz mass = 30.73 (gm) density = 2.61 (gm/cc)

SiO2
G = -493688.81 (J)  H = -433892.98 (J)  S = 59.02 (J/K)  V = 11.78 (cc)  Cp = 40.70 (J/K)

rhm-oxide  mass = 0.26 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.76Mg0.10Fe'"0.09Al0.08Ti0.91O3
G = -2471.52 (J)  H = -2014.63 (J)  S = 0.45 (J/K)  V = 0.06 (cc)  Cp = 0.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.87 | 4.59 | 76.04 | 5.28 | 4.22 |

apatite  mass = 0.06 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -882.56 (J)  H = -759.90 (J)  S = 0.12 (J/K)  V = 0.02 (cc)  Cp = 0.07 (J/K)

Total solids  mass = 92.72 (gm)  density = 2.75 (gm/cc)
G = -1440938.43 (J)  H = -1254480.29 (J)  S = 184.04 (J/K)  V = 33.66 (cc)  Cp = 115.01 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.94 (gm)  density = 2.71 (gm/cc)
G = -1558268.48 (J)  H = -1350063.74 (J)  S = 205.50 (J/K)  V = 36.86 (cc)  Cp = 125.38 (J/K)

Oxygen  delta moles = -0.00182577  delta grams = -0.0584225
G = 409.10 (J)  H = -42.28 (J)  S = -0.45 (J/K)  V = -153.80 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: felsic

T = 730.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.29  COH = 0.72
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 5.67 (gm)  density = 2.21 (gm/cc)  viscosity = 1.50 (log 10 poise)  (analysis in wt %)
G = -92679.91 (J)  H = -74770.86 (J)  S = 17.85 (J/K)  V = 2.57 (cc)  Cp = 8.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.78 | 0.07 | 11.31 | 0.18 | 0.00 | 0.49 | 1.32 | 0.07 | 0.00 | 0.00 | 3.63 | 7.28 | 2.30 | 2.37 | 16.20 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 12.48 (gm)  density = 3.97 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.61Mg0.21)3Al2Si3O12
G = -163994.18 (J)  H = -141173.46 (J)  S = 22.75 (J/K)  V = 3.14 (cc)  Cp = 13.23 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.30 | 17.47 | 21.23 |

clinopyroxene  mass = 2.06 (gm)  density = 3.60 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.90Fe"0.26Mg0.30Fe'"0.02Ti0.44Al0.80Si1.19O6
G = -29685.71 (J)  H = -25927.44 (J)  S = 3.75 (J/K)  V = 0.57 (cc)  Cp = 2.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -16.87 | 1.12 | 25.52 | 78.48 | 9.88 | -7.52 | 9.38 |

biotite  mass = 1.99 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -31183.95 (J)  H = -26962.72 (J)  S = 4.21 (J/K)  V = 0.72 (cc)  Cp = 2.49 (J/K)

annite phlogopite
4.12 95.88

feldspar mass = 40.84 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.77Ca0.14Al1.14Si2.86O8
G = -651088.72 (J) H = -566548.94 (J) S = 84.27 (J/K) V = 15.66 (cc) Cp = 51.55 (J/K)
albite anorthite sanidine
76.77 13.94 9.29

feldspar mass = 5.31 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -81977.31 (J) H = -71222.39 (J) S = 10.72 (J/K) V = 2.08 (cc) Cp = 6.34 (J/K)
albite anorthite sanidine
28.93 0.98 70.09

quartz mass = 31.35 (gm) density = 2.61 (gm/cc)
SiO2
G = -503156.69 (J) H = -443155.16 (J) S = 59.81 (J/K) V = 12.01 (cc) Cp = 41.19 (J/K)

rhm-oxide mass = 0.23 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.77Mg0.10Fe'"0.09Al0.09Ti0.91O3
G = -2243.47 (J) H = -1834.39 (J) S = 0.41 (J/K) V = 0.05 (cc) Cp = 0.21 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.54 4.33 76.93 4.93 4.27

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -203.59 (J) H = -175.69 (J) S = 0.03 (J/K) V = 0.00 (cc) Cp = 0.02 (J/K)

Total solids mass = 94.27 (gm) density = 2.75 (gm/cc)
G = -1463533.61 (J) H = -1277000.18 (J) S = 185.95 (J/K) V = 34.24 (cc) Cp = 117.22 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.72 (gm/cc)
G = -1556213.52 (J) H = -1351771.04 (J) S = 203.80 (J/K) V = 36.81 (cc) Cp = 125.64 (J/K)

Oxygen delta moles = -0.00184199 delta grams = -0.0589416
G = 408.24 (J) H = -42.02 (J) S = -0.45 (J/K) V = -153.63 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.08 (log 10 poise)  (analysis in wt %)
G = -1660105.22 (J)  H = -1214476.20 (J)  S = 283.27 (J/K)  V = 39.92 (cc)  Cp = 144.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.36 | 0.00 | 6.46 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.08 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1660105.22 (J)  H = -1214476.20 (J)  S = 283.27 (J/K)  V = 39.92 (cc)  Cp = 144.66 (J/K)

Oxygen  delta moles = 3.81639e-17  delta grams = 1.2212e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.13 (log 10 poise)  (analysis in wt %)
G = -1657280.17 (J)  H = -1215925.36 (J)  S = 282.35 (J/K)  V = 39.89 (cc)  Cp = 144.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.36 | 0.00 | 6.46 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1657280.17 (J)  H = -1215925.36 (J)  S = 282.35 (J/K)  V = 39.89 (cc)  Cp = 144.66 (J/K)

Oxygen  delta moles = 5.56823e-06  delta grams = 0.000178177
G = -2.02 (J)  H = 0.24 (J)  S = 0.00 (J/K)  V = 0.72 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.18 (log 10 poise)  (analysis in wt %)
G = -1654464.69 (J)  H = -1217374.73 (J)  S = 281.42 (J/K)  V = 39.86 (cc)  Cp = 144.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.36 | 0.00 | 6.46 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.18 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1654464.69 (J)  H = -1217374.73 (J)  S = 281.42 (J/K)  V = 39.86 (cc)  Cp = 144.65 (J/K)

Oxygen  delta moles = 1.17115e-05  delta grams = 0.000374754
G = -4.22 (J)  H = 0.50 (J)  S = 0.00 (J/K)  V = 1.51 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.23 (log 10 poise)  (analysis in wt %)
G = -1651658.84 (J)  H = -1218824.32 (J)  S = 280.49 (J/K)  V = 39.83 (cc)  Cp = 144.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.37 | 0.00 | 6.46 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.23 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1651658.84 (J)  H = -1218824.32 (J)  S = 280.49 (J/K)  V = 39.83 (cc)  Cp = 144.65 (J/K)

Oxygen  delta moles = 1.84461e-05  delta grams = 0.000590252
G = -6.60 (J)  H = 0.78 (J)  S = 0.00 (J/K)  V = 2.37 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.28 (log 10 poise)  (analysis in wt %)
G = -1648862.69 (J)  H = -1220274.15 (J)  S = 279.55 (J/K)  V = 39.80 (cc)  Cp = 144.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.37 | 0.00 | 6.45 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.28 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1648862.69 (J)  H = -1220274.15 (J)  S = 279.55 (J/K)  V = 39.80 (cc)  Cp = 144.64 (J/K)

Oxygen  delta moles = 2.5789e-05  delta grams = 0.000825216
G = -9.16 (J)  H = 1.08 (J)  S = 0.01 (J/K)  V = 3.29 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.33 (log 10 poise)  (analysis in wt %)
G = -1646076.31 (J)  H = -1221724.22 (J)  S = 278.60 (J/K)  V = 39.77 (cc)  Cp = 144.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.37 | 0.00 | 6.45 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.33 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1646076.31 (J)  H = -1221724.22 (J)  S = 278.60 (J/K)  V = 39.77 (cc)  Cp = 144.63 (J/K)

Oxygen  delta moles = 3.37579e-05  delta grams = 0.00108021
G = -11.90 (J)  H = 1.40 (J)  S = 0.01 (J/K)  V = 4.28 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.52 (gm/cc) viscosity = 3.39 (log 10 poise) (analysis in wt %)
G = -1643299.77 (J) H = -1223174.55 (J) S = 277.65 (J/K) V = 39.74 (cc) Cp = 144.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.37 | 0.00 | 6.45 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.39 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1643299.77 (J) H = -1223174.55 (J) S = 277.65 (J/K) V = 39.74 (cc) Cp = 144.63 (J/K)

Oxygen delta moles = 4.23712e-05 delta grams = 0.00135583
G = -14.82 (J) H = 1.74 (J) S = 0.01 (J/K) V = 5.33 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 99.00 (gm) density = 2.52 (gm/cc) viscosity = 3.47 (log 10 poise) (analysis in wt %)
G = -1624679.69 (J) H = -1212844.46 (J) S = 273.98 (J/K) V = 39.36 (cc) Cp = 143.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.04 | 0.81 | 13.45 | 1.37 | 0.00 | 6.38 | 0.09 | 3.50 | 0.00 | 0.00 | 4.21 | 3.42 | 2.52 | 0.17 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.00 (gm) density = 3.27 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.41Mg1.50Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -15832.65 (J) H = -12162.23 (J) S = 2.44 (J/K) V = 0.31 (cc) Cp = 1.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -42.99 | 96.32 | 41.40 | 2.68 | -2.40 | 4.80 | 0.18 |

Total solids mass = 1.00 (gm) density = 3.27 (gm/cc)
G = -15832.65 (J) H = -12162.23 (J) S = 2.44 (J/K) V = 0.31 (cc) Cp = 1.25 (J/K)

Viscosity of the System: 3.49 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1640512.34 (J) H = -1225006.68 (J) S = 276.42 (J/K) V = 39.66 (cc) Cp = 144.26 (J/K)

Oxygen delta moles = 1.16207e-05 delta grams = 0.000371847
G = -4.04 (J) H = 0.47 (J) S = 0.00 (J/K) V = 1.45 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1220.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.34  delta HM = -4.84  NNO = 0.00  QFM = 0.37  COH = 2.39  IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.10 (gm)  density = 2.51 (gm/cc)  viscosity = 3.56 (log 10 poise)  (analysis in wt %)
G = -1607818.99 (J)  H = -1203769.30 (J)  S = 270.60 (J/K)  V = 39.01 (cc)  Cp = 141.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.12 | 0.82 | 13.56 | 1.36 | 0.00 | 6.32 | 0.09 | 3.28 | 0.00 | 0.00 | 4.24 | 3.45 | 2.55 | 0.17 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.90 (gm)  density = 3.28 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.43Mg1.48Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -29918.12 (J)  H = -23022.64 (J)  S = 4.62 (J/K)  V = 0.58 (cc)  Cp = 2.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -44.41 | 96.11 | 42.91 | 2.74 | -2.46 | 4.90 | 0.19 |

Total solids  mass = 1.90 (gm)  density = 3.28 (gm/cc)
G = -29918.12 (J)  H = -23022.64 (J)  S = 4.62 (J/K)  V = 0.58 (cc)  Cp = 2.37 (J/K)

Viscosity of the System: 3.58 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1637737.11 (J)  H = -1226791.94 (J)  S = 275.22 (J/K)  V = 39.59 (cc)  Cp = 143.93 (J/K)

Oxygen  delta moles = -1.88937e-05  delta grams = -0.000604577
G = 6.51 (J)  H = -0.76 (J)  S = -0.00 (J/K)  V = -2.35 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1210.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.45  delta HM = -4.85  NNO = 0.00  QFM = 0.37  COH = 2.37  IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.23 (gm)  density = 2.51 (gm/cc)  viscosity = 3.64 (log 10 poise)  (analysis in wt %)
G = -1591518.69 (J)  H = -1195062.83 (J)  S = 267.31 (J/K)  V = 38.68 (cc)  Cp = 140.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.21 | 0.83 | 13.66 | 1.36 | 0.00 | 6.24 | 0.09 | 3.08 | 0.00 | 0.00 | 4.27 | 3.48 | 2.57 | 0.18 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.77 (gm)  density = 3.29 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.44Mg1.46Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -43453.73 (J)  H = -33496.82 (J)  S = 6.71 (J/K)  V = 0.84 (cc)  Cp = 3.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -45.86 | 95.90 | 44.47 | 2.81 | -2.52 | 5.01 | 0.20 |

Total solids  mass = 2.77 (gm)  density = 3.29 (gm/cc)

G = -43453.73 (J)  H = -33496.82 (J)  S = 6.71 (J/K)  V = 0.84 (cc)  Cp = 3.46 (J/K)

Viscosity of the System: 3.68 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1634972.43 (J)  H = -1228559.65 (J)  S = 274.02 (J/K)  V = 39.52 (cc)  Cp = 143.62 (J/K)

Oxygen  delta moles = -5.20996e-05  delta grams = -0.00166712
G = 17.83 (J)  H = -2.08 (J)  S = -0.01 (J/K)  V = -6.42 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1200.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.56  delta HM = -4.85  NNO = 0.00  QFM = 0.37  COH = 2.35  IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.38 (gm)  density = 2.51 (gm/cc)  viscosity = 3.73 (log 10 poise)  (analysis in wt %)
G = -1575731.05 (J)  H = -1186650.59 (J)  S = 264.11 (J/K)  V = 38.36 (cc)  Cp = 132.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.30 | 0.83 | 13.77 | 1.35 | 0.00 | 6.16 | 0.09 | 2.88 | 0.00 | 0.00 | 4.30 | 3.51 | 2.59 | 0.18 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 3.62 (gm)  density = 3.29 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.46Mg1.44Fe'"0.03Ti0.00Al0.08Si1.95O6
G = -56487.00 (J)  H = -43619.02 (J)  S = 8.74 (J/K)  V = 1.10 (cc)  Cp = 4.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -47.35 | 95.67 | 46.07 | 2.88 | -2.59 | 5.11 | 0.21 |

Total solids  mass = 3.62 (gm)  density = 3.29 (gm/cc)
G = -56487.00 (J)  H = -43619.02 (J)  S = 8.74 (J/K)  V = 1.10 (cc)  Cp = 4.50 (J/K)

Viscosity of the System: 3.78 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1632218.05 (J)  H = -1230269.60 (J)  S = 272.85 (J/K)  V = 39.45 (cc)  Cp = 137.23 (J/K)

Oxygen  delta moles = -8.82031e-05  delta grams = -0.00282239
G = 29.95 (J)  H = -3.49 (J)  S = -0.02 (J/K)  V = -10.80 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1190.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.68  delta HM = -4.86  NNO = 0.00  QFM = 0.36  COH = 2.34  IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.54 (gm)  density = 2.51 (gm/cc)  viscosity = 3.82 (log 10 poise)  (analysis in wt %)
G = -1560406.86 (J)  H = -1178521.27 (J)  S = 261.00 (J/K)  V = 38.04 (cc)  Cp = 131.43 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

63.39 0.84 13.87 1.34 0.00 6.07 0.09 2.69 0.00 0.00 4.32 3.54 2.61 0.18 1.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.45 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.48Mg1.42Fe'"0.03Ti0.00Al0.08Si1.94O6
G = -69066.70 (J) H = -53424.77 (J) S = 10.69 (J/K) V = 1.35 (cc) Cp = 5.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -48.87 | 95.43 | 47.70 | 2.95 | -2.65 | 5.22 | 0.22 |

Total solids mass = 4.45 (gm) density = 3.30 (gm/cc)
G = -69066.70 (J) H = -53424.77 (J) S = 10.69 (J/K) V = 1.35 (cc) Cp = 5.52 (J/K)

Viscosity of the System: 3.88 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1629473.56 (J) H = -1231946.04 (J) S = 271.69 (J/K) V = 39.39 (cc) Cp = 136.95 (J/K)

Oxygen delta moles = -0.000127429 delta grams = -0.00407758
G = 42.94 (J) H = -5.00 (J) S = -0.03 (J/K) V = -15.50 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 94.73 (gm) density = 2.51 (gm/cc) viscosity = 3.91 (log 10 poise) (analysis in wt %)
G = -1545509.25 (J) H = -1170668.54 (J) S = 257.95 (J/K) V = 37.73 (cc) Cp = 130.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.48 | 0.85 | 13.97 | 1.33 | 0.00 | 5.97 | 0.10 | 2.52 | 0.00 | 0.00 | 4.35 | 3.57 | 2.64 | 0.18 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.27 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.49Mg1.40Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -81229.59 (J) H = -62940.67 (J) S = 12.59 (J/K) V = 1.59 (cc) Cp = 6.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.42 | 95.18 | 49.37 | 3.02 | -2.73 | 5.33 | 0.23 |

Total solids mass = 5.27 (gm) density = 3.31 (gm/cc)
G = -81229.59 (J) H = -62940.67 (J) S = 12.59 (J/K) V = 1.59 (cc) Cp = 6.51 (J/K)

Viscosity of the System: 3.98 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1626738.84 (J) H = -1233609.20 (J) S = 270.54 (J/K) V = 39.32 (cc) Cp = 136.67 (J/K)

Oxygen delta moles = -0.000169965 delta grams = -0.00543867
G = 56.84 (J) H = -6.61 (J) S = -0.04 (J/K) V = -20.54 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1170.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.91  delta HM = -4.87  NNO = 0.00  QFM = 0.35  COH = 2.30  IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.93 (gm)  density = 2.51 (gm/cc)  viscosity = 4.00 (log 10 poise)  (analysis in wt %)
G = -1531005.57 (J)  H = -1163069.67 (J)  S = 254.95 (J/K)  V = 37.43 (cc)  Cp = 128.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.58 | 0.85 | 14.07 | 1.31 | 0.00 | 5.86 | 0.10 | 2.35 | 0.00 | 0.00 | 4.37 | 3.60 | 2.66 | 0.18 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.06 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.51Mg1.38Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -93008.22 (J)  H = -72190.34 (J)  S = 14.43 (J/K)  V = 1.83 (cc)  Cp = 7.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -51.99 | 94.92 | 51.08 | 3.10 | -2.80 | 5.45 | 0.24 |

Total solids  mass = 6.06 (gm)  density = 3.32 (gm/cc)
G = -93008.22 (J)  H = -72190.34 (J)  S = 14.43 (J/K)  V = 1.83 (cc)  Cp = 7.47 (J/K)

Viscosity of the System: 4.08 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.55 (gm/cc)
G = -1624013.80 (J)  H = -1235260.01 (J)  S = 269.38 (J/K)  V = 39.26 (cc)  Cp = 136.40 (J/K)

Oxygen  delta moles = -0.00021598  delta grams = -0.00691109
G = 71.67 (J)  H = -8.32 (J)  S = -0.06 (J/K)  V = -25.91 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1160.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.35  COH = 2.29  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.14 (gm)  density = 2.51 (gm/cc)  viscosity = 4.09 (log 10 poise)  (analysis in wt %)
G = -1516866.80 (J)  H = -1155704.33 (J)  S = 252.01 (J/K)  V = 37.14 (cc)  Cp = 127.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.68 | 0.86 | 14.16 | 1.30 | 0.00 | 5.75 | 0.10 | 2.19 | 0.00 | 0.00 | 4.39 | 3.63 | 2.68 | 0.18 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.85 (gm)  density = 3.33 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.53Mg1.36Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -104431.57 (J)  H = -81194.93 (J)  S = 16.21 (J/K)  V = 2.06 (cc)  Cp = 8.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.58 | 94.66 | 52.81 | 3.18 | -2.88 | 5.57 | 0.25 |

Total solids  mass = 6.85 (gm)  density = 3.33 (gm/cc)
G = -104431.57 (J)  H = -81194.93 (J)  S = 16.21 (J/K)  V = 2.06 (cc)  Cp = 8.40 (J/K)

Viscosity of the System: 4.18 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1621298.37 (J) H = -1236899.26 (J) S = 268.22 (J/K) V = 39.19 (cc) Cp = 136.13 (J/K)

Oxygen delta moles = -0.000265622 delta grams = -0.00849958
G = 87.46 (J) H = -10.13 (J) S = -0.07 (J/K) V = -31.65 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1150.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.34 COH = 2.27 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 92.37 (gm) density = 2.51 (gm/cc) viscosity = 4.18 (log 10 poise) (analysis in wt %)
G = -1503067.52 (J) H = -1148554.60 (J) S = 249.10 (J/K) V = 36.85 (cc) Cp = 126.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.78 | 0.87 | 14.26 | 1.28 | 0.00 | 5.62 | 0.10 | 2.03 | 0.00 | 0.00 | 4.41 | 3.66 | 2.70 | 0.19 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.62 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.55Mg1.34Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -115524.99 (J) H = -89973.04 (J) S = 17.95 (J/K) V = 2.28 (cc) Cp = 9.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.19 | 94.38 | 54.55 | 3.27 | -2.96 | 5.69 | 0.26 |

Total solids mass = 7.62 (gm) density = 3.34 (gm/cc)
G = -115524.99 (J) H = -89973.04 (J) S = 17.95 (J/K) V = 2.28 (cc) Cp = 9.32 (J/K)

Viscosity of the System: 4.29 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1618592.52 (J) H = -1238527.64 (J) S = 267.06 (J/K) V = 39.13 (cc) Cp = 135.87 (J/K)

Oxygen delta moles = -0.000319017 delta grams = -0.0102082
G = 104.23 (J) H = -12.05 (J) S = -0.08 (J/K) V = -37.75 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1140.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.34 COH = 2.25 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 91.61 (gm) density = 2.51 (gm/cc) viscosity = 4.27 (log 10 poise) (analysis in wt %)
G = -1489585.92 (J) H = -1141604.99 (J) S = 246.24 (J/K) V = 36.56 (cc) Cp = 125.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.89 | 0.87 | 14.36 | 1.26 | 0.00 | 5.49 | 0.10 | 1.89 | 0.00 | 0.00 | 4.43 | 3.69 | 2.73 | 0.19 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.38 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.56Mg1.32Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -126310.29 (J) H = -98540.72 (J) S = 19.65 (J/K) V = 2.51 (cc) Cp = 10.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.82 | 94.10 | 56.32 | 3.36 | -3.05 | 5.82 | 0.27 |

Total solids mass = 8.38 (gm) density = 3.34 (gm/cc)
G = -126310.29 (J) H = -98540.72 (J) S = 19.65 (J/K) V = 2.51 (cc) Cp = 10.21 (J/K)

Viscosity of the System: 4.39 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1615896.20 (J) H = -1240145.71 (J) S = 265.90 (J/K) V = 39.07 (cc) Cp = 135.61 (J/K)

Oxygen delta moles = -0.000376262 delta grams = -0.0120399
G = 121.97 (J) H = -14.08 (J) S = -0.10 (J/K) V = -44.21 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1130.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.33 COH = 2.23 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 90.86 (gm) density = 2.50 (gm/cc) viscosity = 4.37 (log 10 poise) (analysis in wt %)
G = -1476403.70 (J) H = -1134842.40 (J) S = 243.42 (J/K) V = 36.29 (cc) Cp = 124.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.00 | 0.88 | 14.45 | 1.24 | 0.00 | 5.35 | 0.10 | 1.75 | 0.00 | 0.00 | 4.45 | 3.72 | 2.75 | 0.19 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.13 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.58Mg1.29Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -136805.73 (J) H = -106911.54 (J) S = 21.31 (J/K) V = 2.72 (cc) Cp = 11.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.44 | 93.81 | 58.09 | 3.46 | -3.14 | 5.95 | 0.28 |

Total solids mass = 9.13 (gm) density = 3.35 (gm/cc)
G = -136805.73 (J) H = -106911.54 (J) S = 21.31 (J/K) V = 2.72 (cc) Cp = 11.09 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1613209.43 (J) H = -1241753.94 (J) S = 264.73 (J/K) V = 39.01 (cc) Cp = 135.36 (J/K)

Oxygen delta moles = -0.000437424 delta grams = -0.013997
G = 140.68 (J) H = -16.21 (J) S = -0.11 (J/K) V = -51.03 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1120.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.22 IW

= 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 90.12 (gm) density = 2.50 (gm/cc) viscosity = 4.47 (log 10 poise) (analysis in wt %)
G = -1463506.04 (J) H = -1128256.10 (J) S = 240.64 (J/K) V = 36.01 (cc) Cp = 123.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.11 | 0.89 | 14.55 | 1.22 | 0.00 | 5.21 | 0.10 | 1.63 | 0.00 | 0.00 | 4.47 | 3.75 | 2.77 | 0.19 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.87 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.60Mg1.27Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -147026.16 (J) H = -115096.59 (J) S = 22.92 (J/K) V = 2.93 (cc) Cp = 11.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.07 | 93.51 | 59.87 | 3.56 | -3.24 | 6.09 | 0.29 |

Total solids mass = 9.87 (gm) density = 3.36 (gm/cc)
G = -147026.16 (J) H = -115096.59 (J) S = 22.92 (J/K) V = 2.93 (cc) Cp = 11.95 (J/K)

Viscosity of the System: 4.61 (log 10 poise)

System mass = 99.98 (gm) density = 2.57 (gm/cc)
G = -1610532.20 (J) H = -1243352.69 (J) S = 263.56 (J/K) V = 38.95 (cc) Cp = 135.11 (J/K)

Oxygen delta moles = -0.000502538 delta grams = -0.0160806
G = 160.33 (J) H = -18.44 (J) S = -0.13 (J/K) V = -58.21 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1110.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.20 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 89.38 (gm) density = 2.50 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -1450881.43 (J) H = -1121837.64 (J) S = 237.89 (J/K) V = 35.74 (cc) Cp = 122.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.23 | 0.89 | 14.64 | 1.20 | 0.00 | 5.05 | 0.10 | 1.51 | 0.00 | 0.00 | 4.48 | 3.78 | 2.79 | 0.19 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.60 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.62Mg1.25Fe'"0.03Ti0.00Al0.10Si1.93O6
G = -156983.14 (J) H = -123104.56 (J) S = 24.49 (J/K) V = 3.14 (cc) Cp = 12.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.69 | 93.21 | 61.64 | 3.66 | -3.34 | 6.23 | 0.30 |

Total solids mass = 10.60 (gm) density = 3.37 (gm/cc)
G = -156983.14 (J) H = -123104.56 (J) S = 24.49 (J/K) V = 3.14 (cc) Cp = 12.79 (J/K)

Viscosity of the System: 4.72 (log 10 poise)

System mass = 99.98 (gm) density = 2.57 (gm/cc)
G = -1607864.58 (J) H = -1244942.19 (J) S = 262.39 (J/K) V = 38.89 (cc) Cp = 134.86 (J/K)

Oxygen delta moles = -0.000571602 delta grams = -0.0182906
G = 180.91 (J) H = -20.77 (J) S = -0.15 (J/K) V = -65.73 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1100.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.18 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 87.74 (gm) density = 2.49 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -1426068.08 (J) H = -1106292.93 (J) S = 232.88 (J/K) V = 35.18 (cc) Cp = 119.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.58 | 0.91 | 14.80 | 1.12 | 0.00 | 4.70 | 0.10 | 1.40 | 0.00 | 0.00 | 4.36 | 3.84 | 2.85 | 0.20 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.51 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.62Mg1.24Fe'"0.03Ti0.00Al0.10Si1.93O6
G = -66636.92 (J) H = -52373.34 (J) S = 10.39 (J/K) V = 1.34 (cc) Cp = 5.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.58 | 93.19 | 62.44 | 3.79 | -3.45 | 6.30 | 0.31 |

clinopyroxene mass = 7.72 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.66Mg1.09Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -112494.38 (J) H = -88071.79 (J) S = 17.79 (J/K) V = 2.29 (cc) Cp = 9.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.28 | 84.58 | 65.76 | 4.79 | -4.16 | 8.43 | 0.88 |

Total solids mass = 12.24 (gm) density = 3.38 (gm/cc)
G = -179131.30 (J) H = -140445.14 (J) S = 28.17 (J/K) V = 3.62 (cc) Cp = 14.57 (J/K)

Viscosity of the System: 4.87 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1605199.38 (J) H = -1246738.07 (J) S = 261.05 (J/K) V = 38.80 (cc) Cp = 134.30 (J/K)

Oxygen delta moles = -0.000659369 delta grams = -0.021099
G = 207.01 (J) H = -23.72 (J) S = -0.17 (J/K) V = -75.28 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1090.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.16 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 86.32 (gm) density = 2.49 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -1404175.25 (J) H = -1092809.09 (J) S = 228.42 (J/K) V = 34.68 (cc) Cp = 117.70 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.89 0.91 14.93 1.06 0.00 4.39 0.11 1.29 0.00 0.00 4.25 3.90 2.89 0.20 1.17 0.00 0.00 0.00 0.00

clinopyroxene mass = 13.66 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.66Mg1.08Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -198374.43 (J) H = -155671.44 (J) S = 31.33 (J/K) V = 4.04 (cc) Cp = 16.11 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-60.58 84.02 66.38 4.97 -4.29 8.57 0.94

Total solids mass = 13.66 (gm) density = 3.38 (gm/cc)
G = -198374.43 (J) H = -155671.44 (J) S = 31.33 (J/K) V = 4.04 (cc) Cp = 16.11 (J/K)

Viscosity of the System: 5.02 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1602549.68 (J) H = -1248480.53 (J) S = 259.74 (J/K) V = 38.72 (cc) Cp = 133.81 (J/K)

Oxygen delta moles = -0.000743121 delta grams = -0.023779
G = 231.41 (J) H = -26.46 (J) S = -0.19 (J/K) V = -84.22 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1080.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.30 COH = 2.14 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 85.40 (gm) density = 2.49 (gm/cc) viscosity = 4.93 (log 10 poise) (analysis in wt %)
G = -1389259.61 (J) H = -1084452.35 (J) S = 225.26 (J/K) V = 34.36 (cc) Cp = 116.37 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.08 0.92 15.04 1.02 0.00 4.19 0.11 1.19 0.00 0.00 4.21 3.94 2.93 0.20 1.18 0.00 0.00 0.00 0.00

clinopyroxene mass = 14.57 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.67Mg1.05Fe'"0.04Ti0.00Al0.15Si1.90O6
G = -210658.77 (J) H = -165663.16 (J) S = 33.25 (J/K) V = 4.30 (cc) Cp = 17.13 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-60.76 82.80 67.39 5.17 -4.46 8.83 1.03

Total solids mass = 14.57 (gm) density = 3.39 (gm/cc)
G = -210658.77 (J) H = -165663.16 (J) S = 33.25 (J/K) V = 4.30 (cc) Cp = 17.13 (J/K)

Viscosity of the System: 5.15 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1599918.38 (J) H = -1250115.51 (J) S = 258.51 (J/K) V = 38.65 (cc) Cp = 133.49 (J/K)

Oxygen delta moles = -0.000816408 delta grams = -0.0261241
G = 252.15 (J) H = -28.77 (J) S = -0.21 (J/K) V = -91.85 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1070.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.30  COH = 2.12  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 83.15 (gm)  density = 2.48 (gm/cc)  viscosity = 5.04 (log 10 poise)  (analysis in wt %)
G = -1352268.77 (J)  H = -1058573.64 (J)  S = 218.66 (J/K)  V = 33.51 (cc)  Cp = 113.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.40 | 0.94 | 14.99 | 0.99 | 0.00 | 4.01 | 0.11 | 1.09 | 0.00 | 0.00 | 4.12 | 3.94 | 3.00 | 0.21 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 15.55 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.69Mg1.03Fe'"0.04Ti0.00Al0.15Si1.90O6
G = -223592.25 (J)  H = -176169.46 (J)  S = 35.31 (J/K)  V = 4.58 (cc)  Cp = 18.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.78 | 82.13 | 68.89 | 5.24 | -4.49 | 8.93 | 1.08 |

feldspar  mass = 1.27 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.03Na0.56Ca0.41Al1.41Si2.59O8
G = -21422.44 (J)  H = -17350.97 (J)  S = 3.03 (J/K)  V = 0.48 (cc)  Cp = 1.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.77 | 41.36 | 2.87 |

Total solids  mass = 16.82 (gm)  density = 3.32 (gm/cc)
G = -245014.69 (J)  H = -193520.43 (J)  S = 38.34 (J/K)  V = 5.06 (cc)  Cp = 19.76 (J/K)

Viscosity of the System: 5.30 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.59 (gm/cc)
G = -1597283.46 (J)  H = -1252094.07 (J)  S = 257.00 (J/K)  V = 38.57 (cc)  Cp = 132.91 (J/K)

Oxygen  delta moles = -0.000920336  delta grams = -0.0294497
G = 281.91 (J)  H = -32.11 (J)  S = -0.23 (J/K)  V = -102.78 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1060.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.29  COH = 2.10  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 79.38 (gm)  density = 2.48 (gm/cc)  viscosity = 5.14 (log 10 poise)  (analysis in wt %)
G = -1290193.57 (J)  H = -1012651.33 (J)  S = 208.19 (J/K)  V = 32.07 (cc)  Cp = 107.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.87 | 0.99 | 14.75 | 0.96 | 0.00 | 3.84 | 0.11 | 0.99 | 0.00 | 0.00 | 3.98 | 3.90 | 3.12 | 0.22 | 1.27 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 16.55 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)

cpx Na0.01Ca0.17Fe"0.71Mg1.01Fe'''0.04Ti0.00Al0.15Si1.90O6
G = -236456.98 (J) H = -186605.90 (J) S = 37.39 (J/K) V = 4.86 (cc) Cp = 19.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.98 | 82.24 | 71.06 | 5.13 | -4.35 | 8.81 | 1.09 |

feldspar mass = 4.03 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.57Ca0.40Al1.40Si2.60O8
G = -67994.01 (J) H = -55187.31 (J) S = 9.61 (J/K) V = 1.54 (cc) Cp = 4.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 56.83 | 40.11 | 3.07 |

Total solids mass = 20.59 (gm) density = 3.22 (gm/cc)
G = -304450.99 (J) H = -241793.21 (J) S = 47.00 (J/K) V = 6.40 (cc) Cp = 24.23 (J/K)

Viscosity of the System: 5.49 (log 10 poise)

System mass = 99.97 (gm) density = 2.60 (gm/cc)
G = -1594644.57 (J) H = -1254444.54 (J) S = 255.19 (J/K) V = 38.47 (cc) Cp = 132.03 (J/K)

Oxygen delta moles = -0.00106387 delta grams = -0.0340426
G = 323.18 (J) H = -36.73 (J) S = -0.27 (J/K) V = -117.92 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1050.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.29 COH = 2.08 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 75.87 (gm) density = 2.47 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -1232603.74 (J) H = -970029.68 (J) S = 198.45 (J/K) V = 30.73 (cc) Cp = 102.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.33 | 1.03 | 14.52 | 0.92 | 0.00 | 3.67 | 0.12 | 0.90 | 0.00 | 0.00 | 3.86 | 3.85 | 3.24 | 0.23 | 1.33 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 17.48 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.73Mg0.99Fe'''0.04Ti0.00Al0.15Si1.91O6
G = -248105.60 (J) H = -196130.65 (J) S = 39.28 (J/K) V = 5.12 (cc) Cp = 20.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.98 | 82.31 | 73.09 | 5.01 | -4.21 | 8.67 | 1.10 |

feldspar mass = 6.61 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.58Ca0.39Al1.39Si2.61O8
G = -111314.08 (J) H = -90539.49 (J) S = 15.70 (J/K) V = 2.52 (cc) Cp = 8.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 57.79 | 38.95 | 3.26 |

Total solids mass = 24.09 (gm) density = 3.15 (gm/cc)
G = -359419.68 (J) H = -286670.14 (J) S = 54.98 (J/K) V = 7.64 (cc) Cp = 28.38 (J/K)

Viscosity of the System: 5.68 (log 10 poise)

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1592023.42 (J) H = -1256699.82 (J) S = 253.43 (J/K) V = 38.37 (cc) Cp = 131.22 (J/K)

Oxygen delta moles = -0.00120779 delta grams = -0.038648
G = 363.83 (J) H = -41.26 (J) S = -0.31 (J/K) V = -132.87 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1040.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.28 COH = 2.06 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 72.61 (gm) density = 2.46 (gm/cc) viscosity = 5.33 (log 10 poise) (analysis in wt %)
G = -1179205.29 (J) H = -930495.74 (J) S = 189.40 (J/K) V = 29.48 (cc) Cp = 98.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.78 | 1.07 | 14.30 | 0.89 | 0.00 | 3.48 | 0.12 | 0.83 | 0.00 | 0.00 | 3.75 | 3.78 | 3.37 | 0.24 | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 18.33 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.75Mg0.97Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -258644.26 (J) H = -204825.92 (J) S = 40.98 (J/K) V = 5.35 (cc) Cp = 21.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.78 | 82.35 | 74.98 | 4.91 | -4.07 | 8.51 | 1.11 |

feldspar mass = 9.01 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.59Ca0.38Al1.38Si2.62O8
G = -151570.44 (J) H = -123545.44 (J) S = 21.34 (J/K) V = 3.44 (cc) Cp = 10.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.66 | 37.88 | 3.46 |

Total solids mass = 27.35 (gm) density = 3.11 (gm/cc)
G = -410214.69 (J) H = -328371.36 (J) S = 62.33 (J/K) V = 8.79 (cc) Cp = 32.22 (J/K)

Viscosity of the System: 5.87 (log 10 poise)

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1589419.98 (J) H = -1258867.10 (J) S = 251.73 (J/K) V = 38.28 (cc) Cp = 130.47 (J/K)

Oxygen delta moles = -0.00135116 delta grams = -0.0432356
G = 403.60 (J) H = -45.67 (J) S = -0.34 (J/K) V = -147.52 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1030.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.27 COH = 2.04 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 69.59 (gm) density = 2.46 (gm/cc) viscosity = 5.43 (log 10 poise) (analysis in wt %)
G = -1129720.24 (J) H = -893848.17 (J) S = 181.00 (J/K) V = 28.32 (cc) Cp = 94.00 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.21 1.12 14.09 0.85 0.00 3.29 0.13 0.76 0.00 0.00 3.65 3.71 3.49 0.25 1.45 0.00 0.00 0.00 0.00

clinopyroxene mass = 19.11 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.77Mg0.96Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -268165.73 (J) H = -212763.00 (J) S = 42.51 (J/K) V = 5.57 (cc) Cp = 22.08 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-69.39 82.34 76.73 4.80 -3.94 8.34 1.12

feldspar mass = 11.25 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.59Ca0.37Al1.37Si2.63O8
G = -188948.29 (J) H = -154342.42 (J) S = 26.56 (J/K) V = 4.30 (cc) Cp = 13.80 (J/K)
albite anorthite sanidine
59.46 36.89 3.65

Total solids mass = 30.37 (gm) density = 3.08 (gm/cc)
G = -457114.01 (J) H = -367105.43 (J) S = 69.07 (J/K) V = 9.87 (cc) Cp = 35.88 (J/K)

Viscosity of the System: 6.06 (log 10 poise)

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1586834.25 (J) H = -1260953.59 (J) S = 250.07 (J/K) V = 38.19 (cc) Cp = 129.87 (J/K)

Oxygen delta moles = -0.00149303 delta grams = -0.0477752
G = 442.20 (J) H = -49.93 (J) S = -0.38 (J/K) V = -161.77 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1020.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.27 COH = 2.02 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 66.78 (gm) density = 2.45 (gm/cc) viscosity = 5.52 (log 10 poise) (analysis in wt %)
G = -1083873.39 (J) H = -859886.98 (J) S = 173.21 (J/K) V = 27.25 (cc) Cp = 90.06 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.64 1.16 13.89 0.81 0.00 3.10 0.14 0.70 0.00 0.00 3.56 3.64 3.61 0.26 1.51 0.00 0.00 0.00 0.00

clinopyroxene mass = 19.83 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.78Mg0.94Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -276754.83 (J) H = -220006.47 (J) S = 43.88 (J/K) V = 5.76 (cc) Cp = 22.83 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-70.79 82.30 78.32 4.70 -3.81 8.16 1.12

feldspar mass = 13.34 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.60Ca0.36Al1.36Si2.64O8
G = -223638.00 (J) H = -183072.50 (J) S = 31.37 (J/K) V = 5.10 (cc) Cp = 16.35 (J/K)
albite anorthite sanidine
60.18 35.97 3.85

Total solids mass = 33.17 (gm) density = 3.05 (gm/cc)
G = -500392.84 (J) H = -403078.97 (J) S = 75.25 (J/K) V = 10.86 (cc) Cp = 39.18 (J/K)

Viscosity of the System: 6.26 (log 10 poise)

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1584266.22 (J) H = -1262965.95 (J) S = 248.46 (J/K) V = 38.11 (cc) Cp = 129.24 (J/K)

Oxygen delta moles = -0.00163251 delta grams = -0.0522382
G = 479.38 (J) H = -54.01 (J) S = -0.41 (J/K) V = -175.52 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1010.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.26 COH = 2.00 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 64.18 (gm) density = 2.45 (gm/cc) viscosity = 5.62 (log 10 poise) (analysis in wt %)
G = -1041406.68 (J) H = -828424.97 (J) S = 165.98 (J/K) V = 26.24 (cc) Cp = 86.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.05 | 1.21 | 13.70 | 0.77 | 0.00 | 2.91 | 0.14 | 0.64 | 0.00 | 0.00 | 3.47 | 3.55 | 3.72 | 0.27 | 1.57 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 20.48 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.80Mg0.93Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -284491.19 (J) H = -226616.44 (J) S = 45.10 (J/K) V = 5.94 (cc) Cp = 23.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.00 | 82.22 | 79.77 | 4.60 | -3.69 | 7.97 | 1.13 |

feldspar mass = 15.28 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.61Ca0.35Al1.35Si2.65O8
G = -255818.02 (J) H = -209868.32 (J) S = 35.81 (J/K) V = 5.84 (cc) Cp = 18.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.84 | 35.12 | 4.04 |

Total solids mass = 35.77 (gm) density = 3.03 (gm/cc)
G = -540309.21 (J) H = -436484.76 (J) S = 80.91 (J/K) V = 11.79 (cc) Cp = 42.23 (J/K)

Viscosity of the System: 6.46 (log 10 poise)

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1581715.89 (J) H = -1264909.73 (J) S = 246.90 (J/K) V = 38.03 (cc) Cp = 128.66 (J/K)

Oxygen delta moles = -0.00176878 delta grams = -0.0565989
G = 514.93 (J) H = -57.88 (J) S = -0.45 (J/K) V = -188.70 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1000.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.25 COH = 1.98

IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 61.77 (gm) density = 2.44 (gm/cc) viscosity = 5.71 (log 10 poise) (analysis in wt %)
G = -1002070.48 (J) H = -799280.76 (J) S = 159.28 (J/K) V = 25.31 (cc) Cp = 83.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.44 | 1.25 | 13.52 | 0.72 | 0.00 | 2.72 | 0.15 | 0.59 | 0.00 | 0.00 | 3.39 | 3.46 | 3.84 | 0.28 | 1.63 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 21.08 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.81Mg0.92Fe'"0.04Ti0.00Al0.13Si1.91O6
G = -291450.84 (J) H = -232649.93 (J) S = 46.19 (J/K) V = 6.11 (cc) Cp = 24.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.03 | 82.12 | 81.08 | 4.50 | -3.57 | 7.76 | 1.14 |

feldspar mass = 17.09 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.61Ca0.34Al1.34Si2.66O8
G = -285661.90 (J) H = -234859.91 (J) S = 39.90 (J/K) V = 6.54 (cc) Cp = 20.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.44 | 34.33 | 4.23 |

Total solids mass = 38.17 (gm) density = 3.02 (gm/cc)
G = -577112.75 (J) H = -467509.84 (J) S = 86.09 (J/K) V = 12.64 (cc) Cp = 45.05 (J/K)

Viscosity of the System: 6.66 (log 10 poise)

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1579183.23 (J) H = -1266790.59 (J) S = 245.37 (J/K) V = 37.96 (cc) Cp = 128.11 (J/K)

Oxygen delta moles = -0.00190117 delta grams = -0.0608352
G = 548.68 (J) H = -61.53 (J) S = -0.48 (J/K) V = -201.25 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 990.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.25 COH = 1.96 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 59.56 (gm) density = 2.44 (gm/cc) viscosity = 5.79 (log 10 poise) (analysis in wt %)
G = -965662.36 (J) H = -772253.09 (J) S = 153.12 (J/K) V = 24.45 (cc) Cp = 79.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.80 | 1.30 | 13.31 | 0.69 | 0.00 | 2.56 | 0.15 | 0.55 | 0.00 | 0.00 | 3.35 | 3.37 | 3.95 | 0.29 | 1.69 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.14 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.83Mg1.05Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -29672.63 (J) H = -23789.99 (J) S = 4.66 (J/K) V = 0.62 (cc) Cp = 2.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.78 | 93.66 | 82.59 | 3.59 | -3.19 | 5.81 | 0.32 |

clinopyroxene mass = 19.34 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.83Mg0.90Fe'"0.04Ti0.00Al0.13Si1.91O6
G = -266071.38 (J) H = -212825.50 (J) S = 42.15 (J/K) V = 5.59 (cc) Cp = 22.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.70 | 81.45 | 82.51 | 4.41 | -3.43 | 7.61 | 1.16 |

feldspar mass = 18.89 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.34Al1.34Si2.66O8
G = -315257.59 (J) H = -259763.49 (J) S = 43.93 (J/K) V = 7.23 (cc) Cp = 23.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.79 | 33.81 | 4.40 |

Total solids mass = 40.38 (gm) density = 3.01 (gm/cc)
G = -611001.60 (J) H = -496378.98 (J) S = 90.74 (J/K) V = 13.43 (cc) Cp = 47.66 (J/K)

Viscosity of the System: 6.86 (log 10 poise)

System mass = 99.93 (gm) density = 2.64 (gm/cc)
G = -1576663.96 (J) H = -1268632.08 (J) S = 243.86 (J/K) V = 37.89 (cc) Cp = 127.63 (J/K)

Oxygen delta moles = -0.00203713 delta grams = -0.0651857
G = 582.78 (J) H = -65.20 (J) S = -0.51 (J/K) V = -213.94 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 980.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.24 COH = 1.93 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 57.33 (gm) density = 2.43 (gm/cc) viscosity = 5.89 (log 10 poise) (analysis in wt %)
G = -929571.25 (J) H = -745428.65 (J) S = 146.94 (J/K) V = 23.60 (cc) Cp = 76.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.30 | 1.23 | 13.10 | 0.65 | 0.00 | 2.37 | 0.16 | 0.50 | 0.00 | 0.00 | 3.31 | 3.27 | 4.07 | 0.30 | 1.76 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.92 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.84Mg1.03Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -53964.51 (J) H = -43352.83 (J) S = 8.47 (J/K) V = 1.13 (cc) Cp = 4.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.13 | 93.65 | 84.14 | 3.48 | -3.11 | 5.67 | 0.31 |

clinopyroxene mass = 17.87 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.83Mg0.88Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -244825.88 (J) H = -196282.60 (J) S = 38.74 (J/K) V = 5.16 (cc) Cp = 20.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.63 | 80.64 | 83.47 | 4.25 | -3.32 | 7.41 | 1.19 |

feldspar mass = 20.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.62Ca0.33Al1.33Si2.67O8
G = -344247.99 (J) H = -284276.19 (J) S = 47.86 (J/K) V = 7.90 (cc) Cp = 25.23 (J/K)

albite anorthite sanidine
62.06 33.35 4.60

rhm-oxide mass = 0.15 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.68Mg0.13Fe'"0.22Al0.11Ti0.83O3
G = -1567.59 (J) H = -1183.96 (J) S = 0.31 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)
geikielite hematite ilmenite pyrophanite corundum
13.38 11.16 67.86 2.03 5.57

Total solids mass = 42.60 (gm) density = 3.00 (gm/cc)
G = -644605.97 (J) H = -525095.57 (J) S = 95.37 (J/K) V = 14.22 (cc) Cp = 50.26 (J/K)

Viscosity of the System: 7.10 (log 10 poise)

System mass = 99.93 (gm) density = 2.64 (gm/cc)
G = -1574177.22 (J) H = -1270524.23 (J) S = 242.31 (J/K) V = 37.82 (cc) Cp = 127.12 (J/K)

Oxygen delta moles = -0.00214113 delta grams = -0.0685135
G = 607.14 (J) H = -67.76 (J) S = -0.54 (J/K) V = -223.09 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 970.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.24 COH = 1.91 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 55.33 (gm) density = 2.42 (gm/cc) viscosity = 5.99 (log 10 poise) (analysis in wt %)
G = -896877.42 (J) H = -721157.86 (J) S = 141.35 (J/K) V = 22.83 (cc) Cp = 74.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.78 | 1.16 | 12.90 | 0.61 | 0.00 | 2.21 | 0.16 | 0.46 | 0.00 | 0.00 | 3.25 | 3.17 | 4.18 | 0.31 | 1.82 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.72 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.86Mg1.02Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -92084.05 (J) H = -74115.01 (J) S = 14.45 (J/K) V = 1.93 (cc) Cp = 7.78 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-85.89 93.69 86.00 3.40 -3.06 5.56 0.31

clinopyroxene mass = 14.94 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.19Fe"0.85Mg0.86Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -203756.33 (J) H = -163705.70 (J) S = 32.22 (J/K) V = 4.31 (cc) Cp = 16.95 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-74.09 79.98 84.77 4.11 -3.23 7.25 1.21

clinopyroxene mass = 0.40 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.41Mg0.62Fe'"0.07Ti0.03Al0.20Si1.85O6
G = -5851.76 (J) H = -4794.36 (J) S = 0.85 (J/K) V = 0.12 (cc) Cp = 0.45 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
20.45 18.92 41.48 7.32 -0.70 7.91 4.62

feldspar mass = 22.25 (gm) density = 2.61 (gm/cc) (analysis in mole %)

K0.05Na0.62Ca0.33Al1.33Si2.67O8
G = -370257.45 (J) H = -306426.49 (J) S = 51.35 (J/K) V = 8.51 (cc) Cp = 27.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.34 | 32.86 | 4.80 |

rhm-oxide mass = 0.29 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.68Mg0.13Fe'"0.22Al0.11Ti0.84O3
G = -2884.98 (J) H = -2184.93 (J) S = 0.56 (J/K) V = 0.06 (cc) Cp = 0.27 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.98 | 11.05 | 68.50 | 2.11 | 5.37 |

Total solids mass = 44.60 (gm) density = 2.99 (gm/cc)
G = -674834.57 (J) H = -551226.48 (J) S = 99.43 (J/K) V = 14.93 (cc) Cp = 52.61 (J/K)

Viscosity of the System: 7.35 (log 10 poise)

System mass = 99.93 (gm) density = 2.65 (gm/cc)
G = -1571711.99 (J) H = -1272384.34 (J) S = 240.78 (J/K) V = 37.76 (cc) Cp = 126.67 (J/K)

Oxygen delta moles = -0.00223365 delta grams = -0.071474
G = 627.76 (J) H = -69.89 (J) S = -0.56 (J/K) V = -230.87 (cc) Cp = -0.08 (J/K)

**********_____**********
Title: intermediate

T = 960.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.23 COH = 1.89 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 53.57 (gm) density = 2.42 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -867895.14 (J) H = -699696.40 (J) S = 136.40 (J/K) V = 22.15 (cc) Cp = 71.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.20 | 1.09 | 12.75 | 0.59 | 0.00 | 2.11 | 0.16 | 0.41 | 0.00 | 0.00 | 3.16 | 3.06 | 4.27 | 0.32 | 1.88 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.88 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.89Mg0.98Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -188324.86 (J) H = -151753.30 (J) S = 29.66 (J/K) V = 3.97 (cc) Cp = 16.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.65 | 93.93 | 89.46 | 3.40 | -3.09 | 5.65 | 0.30 |

clinopyroxene mass = 6.17 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.88Mg0.83Fe'"0.04Ti0.00Al0.12Si1.92O6
G = -83276.84 (J) H = -66986.43 (J) S = 13.21 (J/K) V = 1.77 (cc) Cp = 6.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.80 | 80.38 | 88.16 | 3.99 | -3.18 | 7.26 | 1.19 |

clinopyroxene mass = 2.29 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.43Mg0.60Fe'"0.07Ti0.03Al0.20Si1.86O6
G = -33418.31 (J) H = -27427.77 (J) S = 4.86 (J/K) V = 0.68 (cc) Cp = 2.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.23 | 18.64 | 43.04 | 7.05 | -0.58 | 7.92 | 4.70 |

feldspar mass = 23.62 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.63Ca0.32Al1.32Si2.68O8
G = -392377.97 (J) H = -325438.87 (J) S = 54.28 (J/K) V = 9.04 (cc) Cp = 28.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.77 | 32.21 | 5.02 |

rhm-oxide mass = 0.40 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.69Mg0.12Fe'"0.22Al0.10Ti0.84O3
G = -3990.94 (J) H = -3029.00 (J) S = 0.78 (J/K) V = 0.09 (cc) Cp = 0.38 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.25 | 11.16 | 69.24 | 2.15 | 5.20 |

Total solids mass = 46.35 (gm) density = 2.98 (gm/cc)
G = -701388.92 (J) H = -574635.37 (J) S = 102.79 (J/K) V = 15.54 (cc) Cp = 54.70 (J/K)

Viscosity of the System: 7.60 (log 10 poise)

System mass = 99.93 (gm) density = 2.65 (gm/cc)
G = -1569284.06 (J) H = -1274331.77 (J) S = 239.19 (J/K) V = 37.69 (cc) Cp = 126.29 (J/K)

Oxygen delta moles = -0.00228598 delta grams = -0.0731486
G = 636.73 (J) H = -70.71 (J) S = -0.57 (J/K) V = -234.38 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 950.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.22 COH = 1.87 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 51.91 (gm) density = 2.41 (gm/cc) viscosity = 6.19 (log 10 poise) (analysis in wt %)
G = -840600.59 (J) H = -679502.61 (J) S = 131.71 (J/K) V = 21.51 (cc) Cp = 69.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.62 | 1.02 | 12.61 | 0.56 | 0.00 | 1.99 | 0.16 | 0.37 | 0.00 | 0.00 | 3.07 | 2.96 | 4.37 | 0.33 | 1.94 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.97 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.92Mg0.96Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -255385.49 (J) H = -206100.77 (J) S = 40.29 (J/K) V = 5.41 (cc) Cp = 21.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.62 | 94.16 | 92.22 | 3.39 | -3.10 | 5.67 | 0.29 |

clinopyroxene mass = 3.67 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.44Mg0.58Fe'"0.07Ti0.03Al0.19Si1.86O6
G = -53300.32 (J) H = -43833.21 (J) S = 7.74 (J/K) V = 1.08 (cc) Cp = 4.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.62 | 18.25 | 44.14 | 6.85 | -0.47 | 7.85 | 4.76 |

feldspar mass = 24.87 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.63Ca0.32Al1.32Si2.68O8
G = -412651.71 (J) H = -342996.39 (J) S = 56.95 (J/K) V = 9.52 (cc) Cp = 30.30 (J/K)

albite anorthite sanidine
63.18 31.57 5.24

rhm-oxide mass = 0.49 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.22Al0.10Ti0.84O3
G = -4929.78 (J) H = -3751.07 (J) S = 0.96 (J/K) V = 0.11 (cc) Cp = 0.47 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.71 11.14 69.90 2.21 5.05

Total solids mass = 48.02 (gm) density = 2.98 (gm/cc)
G = -726267.30 (J) H = -596681.45 (J) S = 105.94 (J/K) V = 16.12 (cc) Cp = 56.66 (J/K)

Viscosity of the System: 7.88 (log 10 poise)

System mass = 99.92 (gm) density = 2.66 (gm/cc)
G = -1566867.89 (J) H = -1276184.06 (J) S = 237.65 (J/K) V = 37.62 (cc) Cp = 125.91 (J/K)

Oxygen delta moles = -0.00234591 delta grams = -0.0750663
G = 647.54 (J) H = -71.73 (J) S = -0.59 (J/K) V = -238.57 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 940.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.21 COH = 1.84 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 50.29 (gm) density = 2.41 (gm/cc) viscosity = 6.29 (log 10 poise) (analysis in wt %)
G = -814410.58 (J) H = -660136.04 (J) S = 127.17 (J/K) V = 20.88 (cc) Cp = 66.99 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.05 0.97 12.49 0.51 0.00 1.81 0.17 0.34 0.00 0.00 2.98 2.86 4.47 0.34 2.00 0.00 0.00 0.00 0.00

orthopyroxene mass = 19.07 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.93Mg0.95Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -255742.16 (J) H = -206865.31 (J) S = 40.29 (J/K) V = 5.43 (cc) Cp = 21.85 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-93.58 94.31 93.18 3.34 -3.07 5.55 0.28

clinopyroxene mass = 3.95 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.78Fe"0.44Mg0.58Fe'"0.07Ti0.03Al0.19Si1.86O6
G = -57315.67 (J) H = -47258.00 (J) S = 8.29 (J/K) V = 1.17 (cc) Cp = 4.42 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
19.64 17.61 44.01 6.78 -0.41 7.58 4.80

feldspar mass = 26.04 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.64Ca0.31Al1.31Si2.69O8
G = -431256.35 (J) H = -359236.06 (J) S = 59.37 (J/K) V = 9.97 (cc) Cp = 31.69 (J/K)
albite anorthite sanidine
63.62 30.91 5.47

rhm-oxide mass = 0.58 (gm) density = 4.61 (gm/cc) (analysis in mole %)

Mn0.02Fe"0.70Mg0.12Fe'''0.22Al0.10Ti0.84O3
G = -5731.34 (J) H = -4375.53 (J) S = 1.12 (J/K) V = 0.12 (cc) Cp = 0.55 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.54 | 10.81 | 70.43 | 2.31 | 4.91 |

Total solids mass = 49.63 (gm) density = 2.97 (gm/cc)
G = -750045.51 (J) H = -617734.90 (J) S = 109.06 (J/K) V = 16.68 (cc) Cp = 58.50 (J/K)

Viscosity of the System: 8.20 (log 10 poise)

System mass = 99.92 (gm) density = 2.66 (gm/cc)
G = -1564456.09 (J) H = -1277870.94 (J) S = 236.23 (J/K) V = 37.57 (cc) Cp = 125.50 (J/K)

Oxygen delta moles = -0.00242517 delta grams = -0.0776026
G = 663.34 (J) H = -73.28 (J) S = -0.61 (J/K) V = -244.61 (cc) Cp = -0.09 (J/K)

**********_____**********
Title: intermediate

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 48.79 (gm) density = 2.40 (gm/cc) viscosity = 6.40 (log 10 poise) (analysis in wt %)
G = -790127.44 (J) H = -642191.33 (J) S = 122.96 (J/K) V = 20.30 (cc) Cp = 64.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.47 | 0.93 | 12.38 | 0.47 | 0.00 | 1.65 | 0.17 | 0.32 | 0.00 | 0.00 | 2.90 | 2.75 | 4.56 | 0.35 | 2.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 19.14 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.95Fe'''0.02Ti0.00Al0.09Si1.94O6
G = -255834.16 (J) H = -207424.18 (J) S = 40.24 (J/K) V = 5.44 (cc) Cp = 21.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.47 | 94.46 | 94.06 | 3.31 | -3.05 | 5.42 | 0.27 |

clinopyroxene mass = 4.22 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.78Fe"0.44Mg0.58Fe'''0.07Ti0.03Al0.19Si1.86O6
G = -61159.47 (J) H = -50558.74 (J) S = 8.81 (J/K) V = 1.24 (cc) Cp = 4.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.66 | 16.99 | 43.84 | 6.72 | -0.37 | 7.31 | 4.84 |

feldspar mass = 27.12 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.64Ca0.30Al1.30Si2.70O8
G = -448501.14 (J) H = -374409.54 (J) S = 61.58 (J/K) V = 10.38 (cc) Cp = 32.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.02 | 30.28 | 5.69 |

rhm-oxide mass = 0.65 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.11Fe'''0.21Al0.10Ti0.85O3
G = -6437.51 (J) H = -4931.09 (J) S = 1.25 (J/K) V = 0.14 (cc) Cp = 0.62 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.38 | 10.48 | 70.95 | 2.41 | 4.78 |

Total solids mass = 51.13 (gm) density = 2.97 (gm/cc)
G = -771932.27 (J) H = -637323.56 (J) S = 111.88 (J/K) V = 17.21 (cc) Cp = 60.20 (J/K)

Viscosity of the System: 8.56 (log 10 poise)

System mass = 99.92 (gm) density = 2.66 (gm/cc)
G = -1562059.70 (J) H = -1279514.88 (J) S = 234.84 (J/K) V = 37.51 (cc) Cp = 125.11 (J/K)

Oxygen delta moles = -0.00250202 delta grams = -0.0800617
G = 678.10 (J) H = -74.71 (J) S = -0.63 (J/K) V = -250.29 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 920.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.20 COH = 1.79 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 46.84 (gm) density = 2.40 (gm/cc) viscosity = 6.47 (log 10 poise) (analysis in wt %)
G = -758385.74 (J) H = -617902.45 (J) S = 117.74 (J/K) V = 19.53 (cc) Cp = 62.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.69 | 0.88 | 12.34 | 0.43 | 0.00 | 1.50 | 0.17 | 0.30 | 0.00 | 0.00 | 2.81 | 2.66 | 4.70 | 0.37 | 2.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 19.16 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.94Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -255247.74 (J) H = -207440.40 (J) S = 40.07 (J/K) V = 5.44 (cc) Cp = 21.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.31 | 94.63 | 94.83 | 3.29 | -3.05 | 5.34 | 0.27 |

clinopyroxene mass = 4.54 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.79Fe"0.44Mg0.58Fe'"0.07Ti0.03Al0.19Si1.87O6
G = -65798.86 (J) H = -54535.56 (J) S = 9.44 (J/K) V = 1.34 (cc) Cp = 5.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.65 | 16.38 | 43.59 | 6.71 | -0.33 | 7.10 | 4.89 |

feldspar mass = 28.24 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.64Ca0.30Al1.30Si2.70O8
G = -466347.92 (J) H = -390148.13 (J) S = 63.86 (J/K) V = 10.82 (cc) Cp = 34.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.33 | 29.68 | 5.99 |

quartz mass = 0.40 (gm) density = 2.55 (gm/cc)
SiO2
G = -6702.53 (J) H = -5668.32 (J) S = 0.87 (J/K) V = 0.16 (cc) Cp = 0.48 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.20Al0.09Ti0.85O3
G = -7203.53 (J) H = -5535.86 (J) S = 1.40 (J/K) V = 0.16 (cc) Cp = 0.69 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.23 | 10.23 | 71.35 | 2.52 | 4.67 |

Total solids mass = 53.07 (gm) density = 2.96 (gm/cc)
G = -801300.57 (J) H = -663328.28 (J) S = 115.64 (J/K) V = 17.91 (cc) Cp = 62.43 (J/K)

Viscosity of the System: 9.19 (log 10 poise)

System mass = 99.92 (gm) density = 2.67 (gm/cc)
G = -1559686.31 (J) H = -1281230.73 (J) S = 233.38 (J/K) V = 37.44 (cc) Cp = 124.70 (J/K)

Oxygen delta moles = -0.0025621 delta grams = -0.0819841
G = 687.98 (J) H = -75.60 (J) S = -0.64 (J/K) V = -254.17 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 910.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.19 COH = 1.77 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 44.27 (gm) density = 2.39 (gm/cc) viscosity = 6.48 (log 10 poise) (analysis in wt %)
G = -716359.84 (J) H = -584872.63 (J) S = 111.13 (J/K) V = 18.50 (cc) Cp = 58.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.63 | 0.82 | 12.43 | 0.41 | 0.00 | 1.39 | 0.18 | 0.28 | 0.00 | 0.00 | 2.72 | 2.59 | 4.89 | 0.39 | 2.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 19.12 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.94Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -253968.11 (J) H = -206897.87 (J) S = 39.78 (J/K) V = 5.42 (cc) Cp = 21.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.11 | 94.80 | 95.49 | 3.32 | -3.09 | 5.32 | 0.26 |

clinopyroxene mass = 4.93 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.79Fe"0.43Mg0.57Fe'"0.07Ti0.03Al0.19Si1.87O6
G = -71376.06 (J) H = -59311.54 (J) S = 10.20 (J/K) V = 1.45 (cc) Cp = 5.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.59 | 15.76 | 43.24 | 6.78 | -0.31 | 6.98 | 4.98 |

feldspar mass = 29.44 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.64Ca0.29Al1.29Si2.71O8
G = -485355.98 (J) H = -406922.08 (J) S = 66.29 (J/K) V = 11.28 (cc) Cp = 35.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.50 | 29.09 | 6.42 |

quartz mass = 1.34 (gm) density = 2.55 (gm/cc)
SiO2
G = -22224.47 (J) H = -18835.34 (J) S = 2.86 (J/K) V = 0.53 (cc) Cp = 1.58 (J/K)

rhm-oxide mass = 0.81 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.20Al0.09Ti0.85O3
G = -8055.39 (J) H = -6209.99 (J) S = 1.56 (J/K) V = 0.18 (cc) Cp = 0.77 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.09 | 10.09 | 71.59 | 2.63 | 4.60 |

Total solids mass = 55.65 (gm) density = 2.95 (gm/cc)
G = -840980.02 (J) H = -698176.82 (J) S = 120.70 (J/K) V = 18.86 (cc) Cp = 65.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.67 (gm/cc)
G = -1557339.85 (J) H = -1283049.45 (J) S = 231.83 (J/K) V = 37.36 (cc) Cp = 124.24 (J/K)

Oxygen delta moles = -0.00260042 delta grams = -0.0832103
G = 691.78 (J) H = -75.80 (J) S = -0.65 (J/K) V = -255.80 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 900.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.19 COH = 1.74 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 41.91 (gm) density = 2.39 (gm/cc) viscosity = 6.49 (log 10 poise) (analysis in wt %)
G = -677821.66 (J) H = -554545.88 (J) S = 105.08 (J/K) V = 17.55 (cc) Cp = 55.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.55 | 0.77 | 12.51 | 0.38 | 0.00 | 1.28 | 0.19 | 0.26 | 0.00 | 0.00 | 2.64 | 2.52 | 5.08 | 0.41 | 2.40 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 19.08 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.93Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -252736.62 (J) H = -206394.33 (J) S = 39.50 (J/K) V = 5.40 (cc) Cp = 21.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.86 | 94.98 | 96.10 | 3.35 | -3.13 | 5.30 | 0.26 |

clinopyroxene mass = 5.28 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.43Mg0.57Fe'"0.07Ti0.03Al0.19Si1.87O6
G = -76415.46 (J) H = -63663.73 (J) S = 10.87 (J/K) V = 1.56 (cc) Cp = 5.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.53 | 15.16 | 42.86 | 6.85 | -0.30 | 6.85 | 5.05 |

feldspar mass = 30.55 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.29Al1.29Si2.71O8
G = -502852.53 (J) H = -422495.68 (J) S = 68.50 (J/K) V = 11.71 (cc) Cp = 37.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.63 | 28.52 | 6.86 |

quartz mass = 2.20 (gm) density = 2.55 (gm/cc)
SiO2
G = -36399.24 (J) H = -30914.20 (J) S = 4.68 (J/K) V = 0.86 (cc) Cp = 2.59 (J/K)

rhm-oxide mass = 0.89 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.20Al0.09Ti0.86O3
G = -8783.25 (J) H = -6792.51 (J) S = 1.70 (J/K) V = 0.19 (cc) Cp = 0.84 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.95 | 9.95 | 71.83 | 2.75 | 4.53 |

Total solids mass = 58.01 (gm) density = 2.94 (gm/cc)
G = -877187.12 (J) H = -730260.45 (J) S = 125.24 (J/K) V = 19.72 (cc) Cp = 68.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.68 (gm/cc)
G = -1555008.77 (J) H = -1284806.33 (J) S = 230.32 (J/K) V = 37.27 (cc) Cp = 123.82 (J/K)

Oxygen delta moles = -0.00263861 delta grams = -0.0844322
G = 695.36 (J) H = -75.98 (J) S = -0.66 (J/K) V = -257.37 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 890.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.18 COH = 1.72 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 39.73 (gm) density = 2.38 (gm/cc) viscosity = 6.50 (log 10 poise) (analysis in wt %)
G = -642281.36 (J) H = -526538.84 (J) S = 99.51 (J/K) V = 16.67 (cc) Cp = 52.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.45 | 0.73 | 12.61 | 0.35 | 0.00 | 1.18 | 0.20 | 0.24 | 0.00 | 0.00 | 2.57 | 2.45 | 5.26 | 0.43 | 2.54 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 19.04 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.97Mg0.93Fe'"0.02Ti0.00Al0.09Si1.95O6
G = -251549.26 (J) H = -205926.06 (J) S = 39.22 (J/K) V = 5.39 (cc) Cp = 21.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.57 | 95.16 | 96.67 | 3.38 | -3.17 | 5.28 | 0.25 |

clinopyroxene mass = 5.60 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.42Mg0.57Fe'"0.06Ti0.03Al0.19Si1.87O6
G = -80991.52 (J) H = -67650.78 (J) S = 11.47 (J/K) V = 1.65 (cc) Cp = 6.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.45 | 14.59 | 42.46 | 6.94 | -0.30 | 6.72 | 5.13 |

feldspar mass = 31.58 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -519047.88 (J) H = -437037.82 (J) S = 70.51 (J/K) V = 12.10 (cc) Cp = 38.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.72 | 27.97 | 7.31 |

quartz mass = 3.00 (gm) density = 2.55 (gm/cc)
SiO2
G = -49415.89 (J) H = -42058.46 (J) S = 6.33 (J/K) V = 1.17 (cc) Cp = 3.52 (J/K)

rhm-oxide mass = 0.96 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.20Al0.09Ti0.86O3
G = -9406.87 (J) H = -7297.83 (J) S = 1.81 (J/K) V = 0.21 (cc) Cp = 0.90 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.82 | 9.80 | 72.06 | 2.86 | 4.46 |

Total solids mass = 60.18 (gm) density = 2.93 (gm/cc)
G = -910411.42 (J) H = -759970.96 (J) S = 129.34 (J/K) V = 20.53 (cc) Cp = 70.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.69 (gm/cc)
G = -1552692.77 (J) H = -1286509.80 (J) S = 228.85 (J/K) V = 37.20 (cc) Cp = 123.43 (J/K)

Oxygen delta moles = -0.00267654 delta grams = -0.0856462
G = 698.69 (J) H = -76.12 (J) S = -0.67 (J/K) V = -258.84 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 880.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.17 COH = 1.69 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 37.72 (gm) density = 2.38 (gm/cc) viscosity = 6.50 (log 10 poise) (analysis in wt %)
G = -609326.46 (J) H = -500528.26 (J) S = 94.35 (J/K) V = 15.85 (cc) Cp = 50.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.33 | 0.68 | 12.70 | 0.33 | 0.00 | 1.08 | 0.20 | 0.23 | 0.00 | 0.00 | 2.50 | 2.38 | 5.44 | 0.45 | 2.67 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 19.00 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.92Fe'"0.02Ti0.00Al0.09Si1.95O6
G = -250404.14 (J) H = -205491.17 (J) S = 38.95 (J/K) V = 5.37 (cc) Cp = 21.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.26 | 95.33 | 97.21 | 3.42 | -3.22 | 5.27 | 0.25 |

clinopyroxene mass = 5.89 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.81Fe"0.42Mg0.57Fe'"0.06Ti0.03Al0.19Si1.87O6
G = -85165.24 (J) H = -71320.70 (J) S = 12.01 (J/K) V = 1.74 (cc) Cp = 6.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.37 | 14.03 | 42.05 | 7.04 | -0.30 | 6.60 | 5.20 |

feldspar mass = 32.55 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.65Ca0.27Al1.27Si2.73O8
G = -534121.09 (J) H = -450692.50 (J) S = 72.35 (J/K) V = 12.48 (cc) Cp = 39.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.77 | 27.44 | 7.79 |

quartz mass = 3.73 (gm) density = 2.55 (gm/cc)
SiO2
G = -61432.54 (J) H = -52396.68 (J) S = 7.84 (J/K) V = 1.46 (cc) Cp = 4.38 (J/K)

rhm-oxide mass = 1.01 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.19Al0.09Ti0.86O3
G = -9942.12 (J) H = -7737.56 (J) S = 1.91 (J/K) V = 0.22 (cc) Cp = 0.95 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.69 | 9.65 | 72.30 | 2.96 | 4.40 |

Total solids mass = 62.20 (gm) density = 2.92 (gm/cc)
G = -941065.13 (J) H = -787638.61 (J) S = 133.05 (J/K) V = 21.27 (cc) Cp = 72.88 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.69 (gm/cc)
G = -1550391.59 (J) H = -1288166.87 (J) S = 227.40 (J/K) V = 37.12 (cc) Cp = 123.06 (J/K)

Oxygen delta moles = -0.00271415 delta grams = -0.0868497
G = 701.76 (J) H = -76.22 (J) S = -0.67 (J/K) V = -260.22 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 870.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.16 COH = 1.66 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 35.84 (gm) density = 2.38 (gm/cc) viscosity = 6.50 (log 10 poise) (analysis in wt %)
G = -578605.67 (J) H = -476238.32 (J) S = 89.55 (J/K) V = 15.09 (cc) Cp = 47.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.19 | 0.64 | 12.80 | 0.31 | 0.00 | 0.99 | 0.21 | 0.22 | 0.00 | 0.00 | 2.44 | 2.31 | 5.61 | 0.48 | 2.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.97 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.92Fe'"0.02Ti0.00Al0.09Si1.95O6
G = -249300.78 (J) H = -205088.96 (J) S = 38.68 (J/K) V = 5.36 (cc) Cp = 21.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.92 | 95.50 | 97.72 | 3.46 | -3.27 | 5.27 | 0.24 |

clinopyroxene mass = 6.16 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.81Fe"0.42Mg0.57Fe'"0.06Ti0.03Al0.19Si1.87O6
G = -88987.15 (J) H = -74713.26 (J) S = 12.49 (J/K) V = 1.82 (cc) Cp = 6.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.28 | 13.50 | 41.62 | 7.15 | -0.31 | 6.48 | 5.27 |

feldspar mass = 33.47 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.65Ca0.27Al1.27Si2.73O8
G = -548226.62 (J) H = -463584.21 (J) S = 74.04 (J/K) V = 12.83 (cc) Cp = 40.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.78 | 26.94 | 8.29 |

quartz mass = 4.41 (gm) density = 2.55 (gm/cc)
SiO2
G = -72582.92 (J) H = -62037.69 (J) S = 9.22 (J/K) V = 1.73 (cc) Cp = 5.18 (J/K)

rhm-oxide mass = 1.06 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.11Fe'"0.19Al0.09Ti0.86O3
G = -10401.87 (J) H = -8121.07 (J) S = 2.00 (J/K) V = 0.23 (cc) Cp = 1.00 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.56 | 9.49 | 72.54 | 3.07 | 4.34 |

Total solids mass = 64.07 (gm) density = 2.92 (gm/cc)
G = -969499.34 (J) H = -813545.19 (J) S = 136.42 (J/K) V = 21.96 (cc) Cp = 75.01 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.70 (gm/cc)
G = -1548105.01 (J) H = -1289783.50 (J) S = 225.97 (J/K) V = 37.05 (cc) Cp = 122.72 (J/K)

Oxygen delta moles = -0.00275138 delta grams = -0.0880409
G = 704.55 (J) H = -76.29 (J) S = -0.68 (J/K) V = -261.50 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 860.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.64 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 34.08 (gm) density = 2.37 (gm/cc) viscosity = 6.50 (log 10 poise) (analysis in wt %)
G = -549816.18 (J) H = -453430.66 (J) S = 85.06 (J/K) V = 14.37 (cc) Cp = 45.39 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.03 | 0.60 | 12.90 | 0.29 | 0.00 | 0.92 | 0.22 | 0.20 | 0.00 | 0.00 | 2.39 | 2.23 | 5.77 | 0.50 | 2.96 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.94 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.92Fe'"0.02Ti0.00Al0.09Si1.95O6
G = -248239.54 (J) H = -204719.57 (J) S = 38.41 (J/K) V = 5.34 (cc) Cp = 21.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.56 | 95.68 | 98.20 | 3.51 | -3.33 | 5.27 | 0.24 |

clinopyroxene mass = 6.41 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.41Mg0.57Fe'"0.06Ti0.03Al0.19Si1.87O6
G = -92499.63 (J) H = -77861.76 (J) S = 12.92 (J/K) V = 1.89 (cc) Cp = 7.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.18 | 12.98 | 41.18 | 7.28 | -0.33 | 6.36 | 5.34 |

feldspar mass = 34.34 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.26Al1.26Si2.74O8
G = -561499.54 (J) H = -475822.05 (J) S = 75.61 (J/K) V = 13.17 (cc) Cp = 41.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.75 | 26.44 | 8.81 |

quartz mass = 5.05 (gm) density = 2.55 (gm/cc)
SiO2
G = -82981.36 (J) H = -71074.68 (J) S = 10.51 (J/K) V = 1.98 (cc) Cp = 5.92 (J/K)

rhm-oxide mass = 1.10 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.19Al0.09Ti0.86O3
G = -10796.58 (J) H = -8456.01 (J) S = 2.07 (J/K) V = 0.24 (cc) Cp = 1.03 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.44 | 9.33 | 72.78 | 3.17 | 4.29 |

Total solids mass = 65.83 (gm) density = 2.91 (gm/cc)
G = -996016.66 (J) H = -837934.06 (J) S = 139.51 (J/K) V = 22.62 (cc) Cp = 77.01 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.70 (gm/cc)
G = -1545832.83 (J) H = -1291364.73 (J) S = 224.57 (J/K) V = 36.99 (cc) Cp = 122.39 (J/K)

Oxygen delta moles = -0.00278818 delta grams = -0.0892185
G = 707.06 (J) H = -76.33 (J) S = -0.69 (J/K) V = -262.68 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 850.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.61 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 32.42 (gm) density = 2.37 (gm/cc) viscosity = 6.49 (log 10 poise) (analysis in wt %)
G = -522693.86 (J) H = -431896.72 (J) S = 80.84 (J/K) V = 13.69 (cc) Cp = 43.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.85 | 0.56 | 13.01 | 0.27 | 0.00 | 0.84 | 0.22 | 0.19 | 0.00 | 0.00 | 2.34 | 2.16 | 5.92 | 0.53 | 3.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.90 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.92Fe"'0.02Ti0.00Al0.09Si1.95O6
G = -247221.39 (J) H = -204383.70 (J) S = 38.14 (J/K) V = 5.33 (cc) Cp = 21.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.19 | 95.85 | 98.66 | 3.56 | -3.39 | 5.27 | 0.23 |

clinopyroxene mass = 6.63 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.41Mg0.57Fe"'0.06Ti0.04Al0.19Si1.87O6
G = -95738.65 (J) H = -80794.46 (J) S = 13.31 (J/K) V = 1.96 (cc) Cp = 7.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.06 | 12.48 | 40.73 | 7.42 | -0.35 | 6.25 | 5.40 |

feldspar mass = 35.16 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.26Al1.26Si2.74O8
G = -574059.50 (J) H = -487503.04 (J) S = 77.07 (J/K) V = 13.48 (cc) Cp = 42.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.68 | 25.97 | 9.35 |

quartz mass = 5.65 (gm) density = 2.55 (gm/cc)
SiO2
G = -92726.72 (J) H = -79588.39 (J) S = 11.70 (J/K) V = 2.22 (cc) Cp = 6.62 (J/K)

rhm-oxide mass = 1.14 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe"'0.18Al0.08Ti0.87O3
G = -11134.80 (J) H = -8748.59 (J) S = 2.12 (J/K) V = 0.25 (cc) Cp = 1.07 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.31 | 9.16 | 73.02 | 3.26 | 4.24 |

Total solids mass = 67.49 (gm) density = 2.91 (gm/cc)
G = -1020881.05 (J) H = -861018.17 (J) S = 142.33 (J/K) V = 23.23 (cc) Cp = 78.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.71 (gm/cc)
G = -1543574.91 (J) H = -1292914.89 (J) S = 223.18 (J/K) V = 36.92 (cc) Cp = 122.09 (J/K)

Oxygen delta moles = -0.00282454 delta grams = -0.0903817
G = 709.28 (J) H = -76.32 (J) S = -0.70 (J/K) V = -263.76 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 840.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.14 COH = 1.58 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 30.79 (gm) density = 2.36 (gm/cc) viscosity = 6.47 (log 10 poise) (analysis in wt %)
G = -496083.91 (J) H = -410675.30 (J) S = 76.73 (J/K) V = 13.03 (cc) Cp = 41.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.65 | 0.52 | 13.11 | 0.25 | 0.00 | 0.78 | 0.23 | 0.18 | 0.00 | 0.00 | 2.30 | 2.09 | 6.05 | 0.56 | 3.27 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.88 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.91Fe'"0.02Ti0.00Al0.09Si1.95O6
G = -246256.80 (J) H = -204090.34 (J) S = 37.88 (J/K) V = 5.32 (cc) Cp = 21.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.80 | 96.02 | 99.10 | 3.63 | -3.46 | 5.29 | 0.23 |

clinopyroxene mass = 6.84 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.83Fe"0.40Mg0.57Fe'"0.06Ti0.04Al0.19Si1.87O6
G = -98706.26 (J) H = -83511.41 (J) S = 13.65 (J/K) V = 2.02 (cc) Cp = 7.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.93 | 11.99 | 40.27 | 7.58 | -0.38 | 6.14 | 5.46 |

feldspar mass = 35.88 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.65Ca0.26Al1.26Si2.74O8
G = -584802.13 (J) H = -497688.35 (J) S = 78.26 (J/K) V = 13.76 (cc) Cp = 43.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.59 | 25.56 | 9.86 |

feldspar mass = 0.12 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.03Al1.03Si2.97O8
G = -1912.80 (J) H = -1623.36 (J) S = 0.26 (J/K) V = 0.05 (cc) Cp = 0.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.11 | 2.78 | 65.11 |

quartz mass = 6.23 (gm) density = 2.55 (gm/cc)
SiO2
G = -102134.95 (J) H = -87847.00 (J) S = 12.84 (J/K) V = 2.44 (cc) Cp = 7.29 (J/K)

rhm-oxide mass = 1.17 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'''0.18Al0.08Ti0.87O3
G = -11434.38 (J) H = -9012.49 (J) S = 2.18 (J/K) V = 0.25 (cc) Cp = 1.09 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.19 | 9.00 | 73.26 | 3.35 | 4.20 |

Total solids mass = 69.12 (gm) density = 2.90 (gm/cc)
G = -1045247.31 (J) H = -883772.95 (J) S = 145.06 (J/K) V = 23.84 (cc) Cp = 80.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.71 (gm/cc)
G = -1541331.22 (J) H = -1294448.26 (J) S = 221.79 (J/K) V = 36.86 (cc) Cp = 121.79 (J/K)

Oxygen delta moles = -0.00286022 delta grams = -0.0915235
G = 711.16 (J) H = -76.28 (J) S = -0.71 (J/K) V = -264.71 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 830.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.13 COH = 1.55 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 28.49 (gm) density = 2.36 (gm/cc) viscosity = 6.38 (log 10 poise) (analysis in wt %)
G = -459086.63 (J) H = -380566.27 (J) S = 71.18 (J/K) V = 12.08 (cc) Cp = 38.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.44 | 0.48 | 13.15 | 0.24 | 0.00 | 0.74 | 0.25 | 0.18 | 0.00 | 0.00 | 2.31 | 2.10 | 5.98 | 0.60 | 3.54 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.86 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.91Fe'''0.02Ti0.00Al0.09Si1.95O6
G = -245521.82 (J) H = -203990.46 (J) S = 37.65 (J/K) V = 5.31 (cc) Cp = 21.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.35 | 96.19 | 99.45 | 3.72 | -3.56 | 5.33 | 0.22 |

clinopyroxene mass = 6.99 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.40Mg0.56Fe'''0.06Ti0.04Al0.19Si1.87O6
G = -100956.89 (J) H = -85634.36 (J) S = 13.89 (J/K) V = 2.06 (cc) Cp = 7.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.80 | 11.50 | 39.72 | 7.82 | -0.44 | 6.06 | 5.53 |

feldspar mass = 35.57 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.26Al1.26Si2.74O8
G = -579109.40 (J) H = -493963.24 (J) S = 77.18 (J/K) V = 13.63 (cc) Cp = 42.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.71 | 25.90 | 9.39 |

feldspar mass = 1.81 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.66Na0.31Ca0.03Al1.03Si2.97O8
G = -28650.88 (J) H = -24370.49 (J) S = 3.88 (J/K) V = 0.72 (cc) Cp = 2.14 (J/K)

albite anorthite sanidine
31.28 2.60 66.12

quartz mass = 6.96 (gm) density = 2.55 (gm/cc)
SiO2
G = -113957.64 (J) H = -98220.23 (J) S = 14.27 (J/K) V = 2.73 (cc) Cp = 8.14 (J/K)

rhm-oxide mass = 1.22 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.10Fe"'0.18Al0.08Ti0.87O3
G = -11820.07 (J) H = -9346.40 (J) S = 2.24 (J/K) V = 0.26 (cc) Cp = 1.13 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.08 8.82 73.50 3.42 4.18

Total solids mass = 71.41 (gm) density = 2.89 (gm/cc)
G = -1080016.70 (J) H = -915525.18 (J) S = 149.11 (J/K) V = 24.71 (cc) Cp = 83.35 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1539103.33 (J) H = -1296091.45 (J) S = 220.29 (J/K) V = 36.80 (cc) Cp = 121.42 (J/K)

Oxygen delta moles = -0.00289346 delta grams = -0.0925874
G = 712.27 (J) H = -76.14 (J) S = -0.71 (J/K) V = -265.39 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 820.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.12 COH = 1.52 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 26.38 (gm) density = 2.35 (gm/cc) viscosity = 6.27 (log 10 poise) (analysis in wt %)
G = -425021.87 (J) H = -352781.51 (J) S = 66.08 (J/K) V = 11.22 (cc) Cp = 35.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.20 | 0.44 | 13.19 | 0.23 | 0.00 | 0.70 | 0.26 | 0.17 | 0.00 | 0.00 | 2.32 | 2.13 | 5.91 | 0.64 | 3.82 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.86 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.91Fe"'0.02Ti0.00Al0.09Si1.94O6
G = -244930.46 (J) H = -204008.18 (J) S = 37.44 (J/K) V = 5.30 (cc) Cp = 21.27 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.90 96.36 99.79 3.81 -3.66 5.38 0.21

clinopyroxene mass = 7.12 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.39Mg0.56Fe"'0.05Ti0.04Al0.20Si1.86O6
G = -102841.43 (J) H = -87455.09 (J) S = 14.08 (J/K) V = 2.10 (cc) Cp = 7.87 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
30.64 11.02 39.18 8.06 -0.49 5.97 5.61

feldspar mass = 35.32 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.26Al1.26Si2.74O8
G = -574487.30 (J) H = -491128.59 (J) S = 76.26 (J/K) V = 13.53 (cc) Cp = 42.60 (J/K)

albite anorthite sanidine
64.83 26.22 8.94

feldspar mass = 3.33 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.67Na0.30Ca0.02Al1.02Si2.98O8
G = -52488.67 (J) H = -44747.63 (J) S = 7.08 (J/K) V = 1.31 (cc) Cp = 3.93 (J/K)
albite anorthite sanidine
30.47 2.44 67.09

quartz mass = 7.64 (gm) density = 2.55 (gm/cc)
SiO2
G = -124915.20 (J) H = -107888.45 (J) S = 15.58 (J/K) V = 3.00 (cc) Cp = 8.92 (J/K)

rhm-oxide mass = 1.25 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.74Mg0.10Fe'"0.17Al0.08Ti0.87O3
G = -12133.06 (J) H = -9624.55 (J) S = 2.29 (J/K) V = 0.27 (cc) Cp = 1.16 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.97 8.64 73.75 3.49 4.16

apatite mass = 0.00 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -71.80 (J) H = -60.77 (J) S = 0.01 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 73.53 (gm) density = 2.88 (gm/cc)
G = -1111867.91 (J) H = -944913.25 (J) S = 152.73 (J/K) V = 25.51 (cc) Cp = 85.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1536889.78 (J) H = -1297694.77 (J) S = 218.81 (J/K) V = 36.73 (cc) Cp = 121.08 (J/K)

Oxygen delta moles = -0.00292777 delta grams = -0.093685
G = 713.49 (J) H = -76.01 (J) S = -0.72 (J/K) V = -266.10 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 24.41 (gm) density = 2.35 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -393302.49 (J) H = -326842.15 (J) S = 61.36 (J/K) V = 10.41 (cc) Cp = 32.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.96 | 0.40 | 13.24 | 0.22 | 0.00 | 0.67 | 0.28 | 0.16 | 0.00 | 0.00 | 2.31 | 2.15 | 5.82 | 0.67 | 4.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.86 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.91Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -244470.45 (J) H = -204134.13 (J) S = 37.24 (J/K) V = 5.30 (cc) Cp = 21.25 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.43 96.53 100.12 3.91 -3.76 5.42 0.21

clinopyroxene mass = 7.23 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.39Mg0.56Fe'"0.05Ti0.04Al0.20Si1.86O6
G = -104396.90 (J) H = -89002.75 (J) S = 14.21 (J/K) V = 2.13 (cc) Cp = 7.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.47 | 10.56 | 38.63 | 8.31 | -0.54 | 5.88 | 5.68 |

feldspar mass = 35.13 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.27Al1.27Si2.73O8
G = -570699.54 (J) H = -488988.55 (J) S = 75.44 (J/K) V = 13.45 (cc) Cp = 42.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.95 | 26.53 | 8.52 |

feldspar mass = 4.70 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.02Al1.02Si2.98O8
G = -73963.81 (J) H = -63197.48 (J) S = 9.94 (J/K) V = 1.86 (cc) Cp = 5.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.67 | 2.29 | 68.04 |

quartz mass = 8.28 (gm) density = 2.55 (gm/cc)
SiO2
G = -135176.62 (J) H = -116993.17 (J) S = 16.79 (J/K) V = 3.25 (cc) Cp = 9.66 (J/K)

rhm-oxide mass = 1.28 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.17Al0.08Ti0.87O3
G = -12385.59 (J) H = -9856.14 (J) S = 2.34 (J/K) V = 0.28 (cc) Cp = 1.18 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.85 | 8.46 | 74.01 | 3.55 | 4.14 |

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -295.08 (J) H = -250.32 (J) S = 0.04 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

Total solids mass = 75.50 (gm) density = 2.87 (gm/cc)
G = -1141387.98 (J) H = -972422.55 (J) S = 155.99 (J/K) V = 26.26 (cc) Cp = 88.01 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1534690.47 (J) H = -1299264.70 (J) S = 217.35 (J/K) V = 36.67 (cc) Cp = 120.76 (J/K)

Oxygen delta moles = -0.00296294 delta grams = -0.0948107
G = 714.76 (J) H = -75.89 (J) S = -0.73 (J/K) V = -266.83 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 22.58 (gm) density = 2.34 (gm/cc) viscosity = 6.03 (log 10 poise) (analysis in wt %)
G = -363897.88 (J) H = -302737.55 (J) S = 56.99 (J/K) V = 9.66 (cc) Cp = 30.37 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.67 0.36 13.28 0.22 0.00 0.64 0.30 0.16 0.00 0.00 2.31 2.19 5.73 0.70 4.46 0.00 0.00 0.00 0.00

orthopyroxene mass = 18.87 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.90Fe"'0.02Ti0.00Al0.10Si1.94O6
G = -244103.23 (J) H = -204336.58 (J) S = 37.06 (J/K) V = 5.30 (cc) Cp = 21.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.96 | 96.69 | 100.45 | 4.00 | -3.86 | 5.47 | 0.20 |

clinopyroxene mass = 7.32 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.38Mg0.56Fe"'0.05Ti0.04Al0.20Si1.86O6
G = -105710.72 (J) H = -90349.85 (J) S = 14.31 (J/K) V = 2.16 (cc) Cp = 8.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.28 | 10.11 | 38.08 | 8.57 | -0.58 | 5.79 | 5.76 |

feldspar mass = 34.98 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.65Ca0.27Al1.27Si2.73O8
G = -567652.50 (J) H = -487467.63 (J) S = 74.72 (J/K) V = 13.38 (cc) Cp = 42.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.08 | 26.81 | 8.12 |

feldspar mass = 5.94 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -93296.61 (J) H = -79895.08 (J) S = 12.49 (J/K) V = 2.34 (cc) Cp = 7.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.89 | 2.14 | 68.96 |

quartz mass = 8.88 (gm) density = 2.55 (gm/cc)
SiO2
G = -144798.26 (J) H = -125579.48 (J) S = 17.91 (J/K) V = 3.48 (cc) Cp = 10.35 (J/K)

rhm-oxide mass = 1.30 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe"'0.17Al0.08Ti0.88O3
G = -12582.41 (J) H = -10044.51 (J) S = 2.36 (J/K) V = 0.28 (cc) Cp = 1.20 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.73 | 8.28 | 74.28 | 3.60 | 4.11 |

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -463.90 (J) H = -394.44 (J) S = 0.06 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 77.33 (gm) density = 2.87 (gm/cc)
G = -1168607.63 (J) H = -998067.57 (J) S = 158.92 (J/K) V = 26.96 (cc) Cp = 90.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.73 (gm/cc)
G = -1532505.51 (J) H = -1300805.12 (J) S = 215.91 (J/K) V = 36.61 (cc) Cp = 120.47 (J/K)

Oxygen delta moles = -0.00299853 delta grams = -0.0959495
G = 715.96 (J) H = -75.74 (J) S = -0.74 (J/K) V = -267.54 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 790.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.09  delta HM = -5.14  NNO = 0.00  QFM = 0.09  COH = 1.43  IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid  mass = 20.87 (gm)  density = 2.33 (gm/cc)  viscosity = 5.88 (log 10 poise)  (analysis in wt %)
G = -336428.78 (J)  H = -280159.77 (J)  S = 52.93 (J/K)  V = 8.95 (cc)  Cp = 28.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.32 | 0.32 | 13.33 | 0.21 | 0.00 | 0.61 | 0.32 | 0.15 | 0.00 | 0.00 | 2.32 | 2.23 | 5.62 | 0.74 | 4.82 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.89 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.90Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -243817.98 (J)  H = -204606.98 (J)  S = 36.88 (J/K)  V = 5.30 (cc)  Cp = 21.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.48 | 96.85 | 100.76 | 4.10 | -3.97 | 5.53 | 0.20 |

clinopyroxene  mass = 7.40 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.38Mg0.57Fe'"0.05Ti0.04Al0.20Si1.86O6
G = -106816.22 (J)  H = -91523.34 (J)  S = 14.38 (J/K)  V = 2.18 (cc)  Cp = 8.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.06 | 9.67 | 37.53 | 8.84 | -0.62 | 5.69 | 5.83 |

feldspar  mass = 34.87 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.65Ca0.27Al1.27Si2.73O8
G = -565216.59 (J)  H = -486458.89 (J)  S = 74.08 (J/K)  V = 13.33 (cc)  Cp = 42.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.19 | 27.07 | 7.74 |

feldspar  mass = 7.07 (gm)  density = 2.53 (gm/cc)  (analysis in mole %)
K0.70Na0.28Ca0.02Al1.02Si2.98O8
G = -110837.14 (J)  H = -95128.56 (J)  S = 14.78 (J/K)  V = 2.79 (cc)  Cp = 8.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.13 | 2.01 | 69.86 |

quartz  mass = 9.45 (gm)  density = 2.55 (gm/cc)
SiO2
G = -153904.63 (J)  H = -133752.06 (J)  S = 18.96 (J/K)  V = 3.71 (cc)  Cp = 11.00 (J/K)

rhm-oxide  mass = 1.32 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.75Mg0.10Fe'"0.16Al0.08Ti0.88O3
G = -12731.28 (J)  H = -10195.44 (J)  S = 2.39 (J/K)  V = 0.28 (cc)  Cp = 1.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.62 | 8.10 | 74.56 | 3.64 | 4.09 |

apatite  mass = 0.04 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -582.23 (J)  H = -496.19 (J)  S = 0.08 (J/K)  V = 0.01 (cc)  Cp = 0.04 (J/K)

Total solids  mass = 79.03 (gm)  density = 2.86 (gm/cc)

G = -1193906.06 (J)  H = -1022161.45 (J)  S = 161.54 (J/K)  V = 27.61 (cc)  Cp = 92.07 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.73 (gm/cc)
G = -1530334.84 (J)  H = -1302321.22 (J)  S = 214.47 (J/K)  V = 36.56 (cc)  Cp = 120.22 (J/K)

Oxygen  delta moles = -0.00303438  delta grams = -0.0970965
G = 717.06 (J)  H = -75.58 (J)  S = -0.75 (J/K)  V = -268.22 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 780.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = 0.08  COH = 1.40  IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 19.26 (gm)  density = 2.32 (gm/cc)  viscosity = 5.72 (log 10 poise)  (analysis in wt %)
G = -310553.44 (J)  H = -258829.68 (J)  S = 49.11 (J/K)  V = 8.29 (cc)  Cp = 26.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.91 | 0.29 | 13.37 | 0.20 | 0.00 | 0.58 | 0.35 | 0.15 | 0.00 | 0.00 | 2.35 | 2.28 | 5.51 | 0.79 | 5.23 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.91 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.90Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -243608.14 (J)  H = -204940.30 (J)  S = 36.72 (J/K)  V = 5.30 (cc)  Cp = 21.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.99 | 97.01 | 101.07 | 4.21 | -4.07 | 5.58 | 0.19 |

clinopyroxene  mass = 7.46 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.37Mg0.57Fe'"0.05Ti0.04Al0.21Si1.86O6
G = -107737.86 (J)  H = -92542.90 (J)  S = 14.43 (J/K)  V = 2.20 (cc)  Cp = 8.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.82 | 9.25 | 36.98 | 9.11 | -0.66 | 5.58 | 5.91 |

feldspar  mass = 34.79 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.07Na0.65Ca0.27Al1.27Si2.73O8
G = -563294.46 (J)  H = -485882.25 (J)  S = 73.51 (J/K)  V = 13.30 (cc)  Cp = 42.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.31 | 27.32 | 7.38 |

feldspar  mass = 8.11 (gm)  density = 2.53 (gm/cc)  (analysis in mole %)
K0.71Na0.27Ca0.02Al1.02Si2.98O8
G = -126882.13 (J)  H = -109142.81 (J)  S = 16.84 (J/K)  V = 3.20 (cc)  Cp = 9.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.38 | 1.88 | 70.74 |

quartz  mass = 10.00 (gm)  density = 2.55 (gm/cc)
SiO2
G = -162612.14 (J)  H = -141609.45 (J)  S = 19.94 (J/K)  V = 3.92 (cc)  Cp = 11.62 (J/K)

rhm-oxide  mass = 1.33 (gm)  density = 4.65 (gm/cc)  (analysis in mole %)

Mn0.04Fe"0.75Mg0.09Fe'''0.16Al0.08Ti0.88O3
G = -12838.40 (J) H = -10313.55 (J) S = 2.40 (J/K) V = 0.29 (cc) Cp = 1.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.50 | 7.92 | 74.85 | 3.67 | 4.07 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -651.89 (J) H = -556.83 (J) S = 0.09 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

Total solids mass = 80.64 (gm) density = 2.86 (gm/cc)
G = -1217625.03 (J) H = -1044988.09 (J) S = 163.92 (J/K) V = 28.22 (cc) Cp = 93.94 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.74 (gm/cc)
G = -1528178.48 (J) H = -1303817.77 (J) S = 213.04 (J/K) V = 36.51 (cc) Cp = 120.00 (J/K)

Oxygen delta moles = -0.00307036 delta grams = -0.0982479
G = 718.02 (J) H = -75.40 (J) S = -0.75 (J/K) V = -268.85 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 770.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = 0.07 COH = 1.37 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 17.57 (gm) density = 2.31 (gm/cc) viscosity = 5.47 (log 10 poise) (analysis in wt %)
G = -283401.37 (J) H = -236256.58 (J) S = 45.19 (J/K) V = 7.59 (cc) Cp = 23.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.44 | 0.25 | 13.21 | 0.21 | 0.00 | 0.58 | 0.43 | 0.14 | 0.00 | 0.00 | 2.40 | 2.46 | 5.30 | 0.86 | 5.73 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 19.59 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.02Mg0.89Fe'''0.01Ti0.00Al0.10Si1.94O6
G = -251574.01 (J) H = -212129.50 (J) S = 37.81 (J/K) V = 5.48 (cc) Cp = 21.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.91 | 97.16 | 101.88 | 4.21 | -4.09 | 5.55 | 0.19 |

clinopyroxene mass = 5.73 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.37Mg0.56Fe'''0.05Ti0.04Al0.20Si1.86O6
G = -82587.66 (J) H = -71104.25 (J) S = 11.01 (J/K) V = 1.69 (cc) Cp = 6.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.32 | 8.94 | 36.86 | 8.98 | -0.58 | 5.41 | 6.07 |

clinopyroxene mass = 2.17 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.29Mg0.30Fe'''0.05Ti0.40Al0.75Si1.23O6
G = -31218.92 (J) H = -26992.53 (J) S = 4.05 (J/K) V = 0.61 (cc) Cp = 2.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.17 | 1.58 | 29.04 | 71.88 | 7.31 | -2.05 | 5.41 |

feldspar mass = 33.95 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.07Na0.66Ca0.27Al1.27Si2.73O8
G = -549098.06 (J) H = -474639.34 (J) S = 71.38 (J/K) V = 12.98 (cc) Cp = 41.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.11 | 26.67 | 7.22 |

feldspar mass = 9.29 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.02Al1.02Si2.98O8
G = -145201.10 (J) H = -125176.25 (J) S = 19.20 (J/K) V = 3.67 (cc) Cp = 10.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.15 | 1.75 | 71.10 |

quartz mass = 10.75 (gm) density = 2.55 (gm/cc)
SiO2
G = -174541.65 (J) H = -152309.09 (J) S = 21.31 (J/K) V = 4.21 (cc) Cp = 12.47 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.75Mg0.09Fe'"0.16Al0.08Ti0.88O3
G = -7674.53 (J) H = -6182.99 (J) S = 1.43 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.31 | 7.85 | 74.85 | 4.02 | 3.97 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -689.27 (J) H = -590.11 (J) S = 0.10 (J/K) V = 0.02 (cc) Cp = 0.05 (J/K)

Total solids mass = 82.32 (gm) density = 2.86 (gm/cc)
G = -1242585.20 (J) H = -1069124.07 (J) S = 166.29 (J/K) V = 28.82 (cc) Cp = 95.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.74 (gm/cc)
G = -1525986.57 (J) H = -1305380.65 (J) S = 211.48 (J/K) V = 36.42 (cc) Cp = 119.79 (J/K)

Oxygen delta moles = -0.00320277 delta grams = -0.102485
G = 741.13 (J) H = -77.53 (J) S = -0.78 (J/K) V = -277.78 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 760.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = 0.07 COH = 1.34 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 15.89 (gm) density = 2.30 (gm/cc) viscosity = 5.15 (log 10 poise) (analysis in wt %)
G = -256336.75 (J) H = -213635.77 (J) S = 41.33 (J/K) V = 6.90 (cc) Cp = 21.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.83 | 0.21 | 12.97 | 0.21 | 0.00 | 0.58 | 0.56 | 0.14 | 0.00 | 0.00 | 2.48 | 2.72 | 5.03 | 0.95 | 6.33 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 20.46 (gm) density = 3.58 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.03Mg0.89Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -261745.82 (J) H = -221206.37 (J) S = 39.24 (J/K) V = 5.72 (cc) Cp = 22.89 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-105.88 97.30 102.80 4.17 -4.05 5.47 0.19

clinopyroxene mass = 3.50 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.37Mg0.56Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -50399.00 (J) H = -43489.69 (J) S = 6.69 (J/K) V = 1.03 (cc) Cp = 3.84 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
34.80 8.68 36.85 8.68 -0.47 5.19 6.27

clinopyroxene mass = 4.95 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.29Mg0.29Fe'"0.05Ti0.40Al0.75Si1.23O6
G = -71161.61 (J) H = -61663.18 (J) S = 9.19 (J/K) V = 1.38 (cc) Cp = 5.30 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-13.59 1.49 29.17 72.24 7.43 -2.33 5.58

feldspar mass = 32.89 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.67Ca0.26Al1.26Si2.74O8
G = -531315.44 (J) H = -460223.07 (J) S = 68.81 (J/K) V = 12.58 (cc) Cp = 39.96 (J/K)
albite anorthite sanidine
67.17 25.71 7.13

feldspar mass = 10.50 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.02Al1.02Si2.98O8
G = -163726.72 (J) H = -141456.70 (J) S = 21.56 (J/K) V = 4.14 (cc) Cp = 12.37 (J/K)
albite anorthite sanidine
27.10 1.63 71.28

quartz mass = 11.56 (gm) density = 2.55 (gm/cc)
SiO2
G = -187500.78 (J) H = -163951.06 (J) S = 22.79 (J/K) V = 4.53 (cc) Cp = 13.40 (J/K)

rhm-oxide mass = 0.10 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.09Fe'"0.16Al0.08Ti0.88O3
G = -941.46 (J) H = -760.61 (J) S = 0.18 (J/K) V = 0.02 (cc) Cp = 0.09 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.11 7.81 74.70 4.52 3.85

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -666.03 (J) H = -571.51 (J) S = 0.09 (J/K) V = 0.02 (cc) Cp = 0.05 (J/K)

Total solids mass = 84.00 (gm) density = 2.86 (gm/cc)
G = -1267456.86 (J) H = -1093322.18 (J) S = 168.55 (J/K) V = 29.42 (cc) Cp = 97.91 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.75 (gm/cc)
G = -1523793.61 (J) H = -1306957.95 (J) S = 209.88 (J/K) V = 36.32 (cc) Cp = 119.62 (J/K)

Oxygen delta moles = -0.00336799 delta grams = -0.107772
G = 771.12 (J) H = -80.35 (J) S = -0.82 (J/K) V = -289.31 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: intermediate

T = 750.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -15.01  delta HM = -5.18  NNO = 0.00  QFM = 0.06  COH = 1.30  IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid  mass = 14.10 (gm)  density = 2.29 (gm/cc)  viscosity = 4.85 (log 10 poise)  (analysis in wt %)
G = -227470.03 (J)  H = -189524.14 (J)  S = 37.09 (J/K)  V = 6.15 (cc)  Cp = 19.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.01 | 0.17 | 12.90 | 0.22 | 0.00 | 0.58 | 0.64 | 0.13 | 0.00 | 0.00 | 2.60 | 2.88 | 4.80 | 1.07 | 7.00 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 20.25 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.87Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -257565.48 (J)  H = -218105.71 (J)  S = 38.57 (J/K)  V = 5.64 (cc)  Cp = 22.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.90 | 97.47 | 104.53 | 4.29 | -4.18 | 5.61 | 0.18 |

clinopyroxene  mass = 3.20 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.37Mg0.56Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -46053.56 (J)  H = -39823.10 (J)  S = 6.09 (J/K)  V = 0.94 (cc)  Cp = 3.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.63 | 8.50 | 37.34 | 8.46 | -0.56 | 5.26 | 6.38 |

clinopyroxene  mass = 5.38 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.30Mg0.29Fe'"0.05Ti0.40Al0.76Si1.22O6
G = -77179.35 (J)  H = -67020.98 (J)  S = 9.93 (J/K)  V = 1.50 (cc)  Cp = 5.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.34 | 1.40 | 29.56 | 72.83 | 7.35 | -2.38 | 5.58 |

biotite  mass = 0.46 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -7215.24 (J)  H = -6206.54 (J)  S = 0.99 (J/K)  V = 0.17 (cc)  Cp = 0.58 (J/K)

| annite | phlogopite |
|---|---|
| 7.04 | 92.96 |

feldspar  mass = 32.93 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.07Na0.67Ca0.26Al1.26Si2.74O8
G = -531316.06 (J)  H = -461228.61 (J)  S = 68.50 (J/K)  V = 12.59 (cc)  Cp = 40.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.46 | 25.71 | 6.83 |

feldspar  mass = 11.10 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.72Na0.26Ca0.02Al1.02Si2.98O8
G = -172841.00 (J)  H = -149661.79 (J)  S = 22.65 (J/K)  V = 4.38 (cc)  Cp = 13.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 26.46 | 1.51 | 72.03 |

quartz  mass = 12.43 (gm)  density = 2.55 (gm/cc)
SiO2
G = -201364.33 (J)  H = -176431.05 (J)  S = 24.37 (J/K)  V = 4.87 (cc)  Cp = 14.39 (J/K)

apatite  mass = 0.05 (gm)  density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -677.26 (J)  H = -582.46 (J)  S = 0.09 (J/K)  V = 0.02 (cc)  Cp = 0.05 (J/K)

Total solids  mass = 85.79 (gm)  density = 2.85 (gm/cc)
G = -1294212.27 (J)  H = -1119060.24 (J)  S = 171.19 (J/K)  V = 30.11 (cc)  Cp = 100.12 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.89 (gm)  density = 2.75 (gm/cc)
G = -1521682.30 (J)  H = -1308584.38 (J)  S = 208.28 (J/K)  V = 36.26 (cc)  Cp = 119.50 (J/K)

Oxygen  delta moles = -0.0034067  delta grams = -0.10901
G = 771.65 (J)  H = -80.08 (J)  S = -0.83 (J/K)  V = -289.80 (cc)  Cp = -0.12 (J/K)

**********----------**********
Title: intermediate

T = 740.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = 0.05  COH = 1.27  IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 11.23 (gm)  density = 2.27 (gm/cc)  viscosity = 4.35 (log 10 poise)  (analysis in wt %)
G = -181269.53 (J)  H = -150735.11 (J)  S = 30.14 (J/K)  V = 4.94 (cc)  Cp = 15.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.88 | 0.14 | 12.41 | 0.25 | 0.00 | 0.64 | 0.81 | 0.11 | 0.00 | 0.00 | 2.79 | 3.36 | 4.38 | 1.25 | 7.98 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 2.11 (gm)  density = 3.98 (gm/cc)  (analysis in mole %)
(Ca0.19Fe"0.63Mg0.18)3Al2Si3O12
G = -27708.82 (J)  H = -23801.21 (J)  S = 3.86 (J/K)  V = 0.53 (cc)  Cp = 2.23 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.18 | 18.58 | 18.23 |

orthopyroxene  mass = 17.12 (gm)  density = 3.61 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.82Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -214914.06 (J)  H = -182154.75 (J)  S = 32.33 (J/K)  V = 4.75 (cc)  Cp = 18.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -113.05 | 97.68 | 109.36 | 4.30 | -4.20 | 5.74 | 0.18 |

clinopyroxene  mass = 3.39 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.85Fe"0.40Mg0.52Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -48350.22 (J)  H = -41860.94 (J)  S = 6.41 (J/K)  V = 1.00 (cc)  Cp = 3.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.67 | 8.41 | 40.02 | 8.04 | -0.10 | 5.18 | 6.78 |

clinopyroxene  mass = 5.45 (gm)  density = 3.59 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.31Mg0.27Fe'"0.05Ti0.40Al0.76Si1.23O6
G = -77748.74 (J)  H = -67624.08 (J)  S = 9.99 (J/K)  V = 1.52 (cc)  Cp = 5.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -15.88 | 1.33 | 31.19 | 72.34 | 7.76 | -2.62 | 5.88 |

biotite  mass = 2.59 (gm)  density = 2.79 (gm/cc)  (analysis in mole %)

K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -40162.45 (J) H = -34591.15 (J) S = 5.50 (J/K) V = 0.93 (cc) Cp = 3.22 (J/K)
annite phlogopite
9.21 90.79

feldspar mass = 32.62 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.69Ca0.24Al1.24Si2.76O8
G = -525545.89 (J) H = -457145.08 (J) S = 67.51 (J/K) V = 12.48 (cc) Cp = 40.06 (J/K)
albite anorthite sanidine
68.90 24.26 6.84

feldspar mass = 10.73 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.72Na0.27Ca0.01Al1.01Si2.99O8
G = -166839.55 (J) H = -144779.25 (J) S = 21.77 (J/K) V = 4.23 (cc) Cp = 12.68 (J/K)
albite anorthite sanidine
26.65 1.39 71.96

quartz mass = 14.58 (gm) density = 2.55 (gm/cc)
SiO2
G = -236038.72 (J) H = -207230.61 (J) S = 28.43 (J/K) V = 5.72 (cc) Cp = 16.86 (J/K)

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1031.31 (J) H = -888.94 (J) S = 0.14 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 88.66 (gm) density = 2.84 (gm/cc)
G = -1338339.76 (J) H = -1160076.01 (J) S = 175.95 (J/K) V = 31.17 (cc) Cp = 103.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.77 (gm/cc)
G = -1519609.29 (J) H = -1310811.11 (J) S = 206.09 (J/K) V = 36.10 (cc) Cp = 119.16 (J/K)

Oxygen delta moles = -0.00340794 delta grams = -0.10905
G = 763.61 (J) H = -78.92 (J) S = -0.83 (J/K) V = -287.07 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: intermediate

T = 730.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = 0.04 COH = 1.24 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 7.89 (gm) density = 2.25 (gm/cc) viscosity = 3.72 (log 10 poise) (analysis in wt %)
G = -127575.01 (J) H = -105689.98 (J) S = 21.82 (J/K) V = 3.51 (cc) Cp = 11.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.35 | 0.10 | 11.62 | 0.30 | 0.00 | 0.72 | 0.80 | 0.10 | 0.00 | 0.00 | 3.06 | 4.19 | 3.82 | 1.52 | 9.42 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.28 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.65Mg0.17)3Al2Si3O12
G = -108073.08 (J) H = -93001.10 (J) S = 15.02 (J/K) V = 2.07 (cc) Cp = 8.72 (J/K)

almandine grossular pyrope
64.62 18.62 16.75

orthopyroxene mass = 8.17 (gm) density = 3.63 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.14Mg0.78Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -101292.16 (J) H = -85936.96 (J) S = 15.31 (J/K) V = 2.25 (cc) Cp = 8.98 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-117.75 97.82 114.00 4.13 -4.04 5.66 0.18

clinopyroxene mass = 8.49 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.43Mg0.49Fe'"0.05Ti0.04Al0.19Si1.87O6
G = -119911.21 (J) H = -103942.93 (J) S = 15.92 (J/K) V = 2.48 (cc) Cp = 9.21 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
28.78 8.39 42.85 7.25 0.52 4.96 7.27

biotite mass = 6.23 (gm) density = 2.81 (gm/cc) (analysis in mole %)
K(Fe"0.12Mg0.88)3AlSi3O10(OH)2
G = -95490.69 (J) H = -82318.23 (J) S = 13.13 (J/K) V = 2.22 (cc) Cp = 7.71 (J/K)
annite phlogopite
12.19 87.81

feldspar mass = 32.69 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.71Ca0.22Al1.22Si2.78O8
G = -525872.42 (J) H = -458325.39 (J) S = 67.33 (J/K) V = 12.52 (cc) Cp = 40.55 (J/K)
albite anorthite sanidine
70.90 22.08 7.02

feldspar mass = 9.01 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.27Ca0.01Al1.01Si2.99O8
G = -140026.31 (J) H = -121773.00 (J) S = 18.20 (J/K) V = 3.55 (cc) Cp = 10.68 (J/K)
albite anorthite sanidine
27.27 1.26 71.47

quartz mass = 17.58 (gm) density = 2.55 (gm/cc)
SiO2
G = -284231.21 (J) H = -250044.56 (J) S = 34.08 (J/K) V = 6.89 (cc) Cp = 20.30 (J/K)

rhm-oxide mass = 1.43 (gm) density = 4.69 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.07Fe'"0.17Al0.07Ti0.88O3
G = -13481.40 (J) H = -10965.35 (J) S = 2.51 (J/K) V = 0.31 (cc) Cp = 1.30 (J/K)
geikielite hematite ilmenite pyrophanite corundum
7.14 8.32 77.20 4.03 3.31

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1747.48 (J) H = -1509.64 (J) S = 0.24 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 92.01 (gm) density = 2.84 (gm/cc)
G = -1390125.96 (J) H = -1207817.16 (J) S = 181.74 (J/K) V = 32.34 (cc) Cp = 107.59 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.79 (gm/cc)
G = -1517700.97 (J) H = -1313507.14 (J) S = 203.55 (J/K) V = 35.86 (cc) Cp = 118.69 (J/K)

Oxygen delta moles = -0.00314032 delta grams = -0.100486
G = 695.99 (J) H = -71.63 (J) S = -0.77 (J/K) V = -261.92 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.08 (log 10 poise)  (analysis in wt %)
G = -1656124.61 (J)  H = -1210974.42 (J)  S = 282.97 (J/K)  V = 39.61 (cc)  Cp = 144.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.31 | 0.00 | 6.50 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.08 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1656124.61 (J)  H = -1210974.42 (J)  S = 282.97 (J/K)  V = 39.61 (cc)  Cp = 144.62 (J/K)

Oxygen  delta moles = -4.51028e-17  delta grams = -1.44324e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.13 (log 10 poise)  (analysis in wt %)
G = -1653302.21 (J)  H = -1212422.82 (J)  S = 282.05 (J/K)  V = 39.58 (cc)  Cp = 144.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.32 | 0.00 | 6.50 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1653302.21 (J)  H = -1212422.82 (J)  S = 282.05 (J/K)  V = 39.58 (cc)  Cp = 144.61 (J/K)

Oxygen  delta moles = 4.84595e-06  delta grams = 0.000155064
G = -1.76 (J)  H = 0.21 (J)  S = 0.00 (J/K)  V = 0.63 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.18 (log 10 poise)  (analysis in wt %)
G = -1650489.35 (J)  H = -1213871.41 (J)  S = 281.12 (J/K)  V = 39.55 (cc)  Cp = 144.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.32 | 0.00 | 6.50 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.18 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1650489.35 (J)  H = -1213871.41 (J)  S = 281.12 (J/K)  V = 39.55 (cc)  Cp = 144.61 (J/K)

Oxygen  delta moles = 1.02425e-05  delta grams = 0.000327748
G = -3.69 (J)  H = 0.44 (J)  S = 0.00 (J/K)  V = 1.32 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.23 (log 10 poise)  (analysis in wt %)
G = -1647686.10 (J)  H = -1215320.20 (J)  S = 280.18 (J/K)  V = 39.52 (cc)  Cp = 144.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.32 | 0.00 | 6.50 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.23 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1647686.10 (J)  H = -1215320.20 (J)  S = 280.18 (J/K)  V = 39.52 (cc)  Cp = 144.60 (J/K)

Oxygen  delta moles = 1.62053e-05  delta grams = 0.000518549
G = -5.80 (J)  H = 0.68 (J)  S = 0.00 (J/K)  V = 2.08 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.28 (log 10 poise)  (analysis in wt %)
G = -1644892.54 (J)  H = -1216769.20 (J)  S = 279.24 (J/K)  V = 39.49 (cc)  Cp = 144.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.32 | 0.00 | 6.50 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.28 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1644892.54 (J)  H = -1216769.20 (J)  S = 279.24 (J/K)  V = 39.49 (cc)  Cp = 144.59 (J/K)

Oxygen  delta moles = 2.27503e-05  delta grams = 0.000727982
G = -8.08 (J)  H = 0.95 (J)  S = 0.01 (J/K)  V = 2.90 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.30 (gm)  density = 2.53 (gm/cc)  viscosity = 3.36 (log 10 poise)  (analysis in wt %)
G = -1631034.30 (J)  H = -1210039.48 (J)  S = 276.40 (J/K)  V = 39.21 (cc)  Cp = 143.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.02 | 0.81 | 13.42 | 1.32 | 0.00 | 6.45 | 0.09 | 3.58 | 0.00 | 0.00 | 4.20 | 3.41 | 2.52 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.70 (gm)  density = 3.27 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.41Mg1.50Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -11060.77 (J)  H = -8452.56 (J)  S = 1.71 (J/K)  V = 0.21 (cc)  Cp = 0.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -42.43 | 96.37 | 40.77 | 2.77 | -2.50 | 4.82 | 0.20 |

Total solids  mass = 0.70 (gm)  density = 3.27 (gm/cc)
G = -11060.77 (J)  H = -8452.56 (J)  S = 1.71 (J/K)  V = 0.21 (cc)  Cp = 0.88 (J/K)

Viscosity of the System: 3.37 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.54 (gm/cc)
G = -1642095.07 (J)  H = -1218492.03 (J)  S = 278.11 (J/K)  V = 39.43 (cc)  Cp = 144.34 (J/K)

Oxygen  delta moles = 4.09639e-06  delta grams = 0.00013108

G = -1.44 (J)  H = 0.17 (J)  S = 0.00 (J/K)  V = 0.52 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW = 4.15

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.40 (gm)  density = 2.53 (gm/cc)  viscosity = 3.44 (log 10 poise)  (analysis in wt %)
G = -1613987.18 (J)  H = -1200909.19 (J)  S = 272.99 (J/K)  V = 38.87 (cc)  Cp = 142.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.10 | 0.82 | 13.52 | 1.31 | 0.00 | 6.39 | 0.09 | 3.36 | 0.00 | 0.00 | 4.23 | 3.44 | 2.54 | 0.17 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.60 (gm)  density = 3.27 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.42Mg1.49Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -25316.40 (J)  H = -19380.80 (J)  S = 3.92 (J/K)  V = 0.49 (cc)  Cp = 2.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -43.83 | 96.16 | 42.25 | 2.83 | -2.56 | 4.93 | 0.21 |

Total solids  mass = 1.60 (gm)  density = 3.27 (gm/cc)
G = -25316.40 (J)  H = -19380.80 (J)  S = 3.92 (J/K)  V = 0.49 (cc)  Cp = 2.01 (J/K)

Viscosity of the System: 3.46 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.54 (gm/cc)
G = -1639303.58 (J)  H = -1220289.99 (J)  S = 276.91 (J/K)  V = 39.36 (cc)  Cp = 144.01 (J/K)

Oxygen  delta moles = -2.51719e-05  delta grams = -0.00080547
G = 8.81 (J)  H = -1.03 (J)  S = -0.01 (J/K)  V = -3.17 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1230.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.23  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.29  IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.52 (gm)  density = 2.53 (gm/cc)  viscosity = 3.52 (log 10 poise)  (analysis in wt %)
G = -1597518.86 (J)  H = -1192158.13 (J)  S = 269.67 (J/K)  V = 38.53 (cc)  Cp = 140.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.18 | 0.83 | 13.63 | 1.31 | 0.00 | 6.32 | 0.09 | 3.15 | 0.00 | 0.00 | 4.26 | 3.47 | 2.56 | 0.18 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.48 (gm)  density = 3.28 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.44Mg1.47Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -39003.83 (J)  H = -29911.53 (J)  S = 6.05 (J/K)  V = 0.76 (cc)  Cp = 3.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -45.25 | 95.95 | 43.78 | 2.90 | -2.62 | 5.03 | 0.22 |

Total solids mass = 2.48 (gm) density = 3.28 (gm/cc)
G = -39003.83 (J) H = -29911.53 (J) S = 6.05 (J/K) V = 0.76 (cc) Cp = 3.10 (J/K)

Viscosity of the System: 3.56 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1636522.69 (J) H = -1222069.66 (J) S = 275.72 (J/K) V = 39.29 (cc) Cp = 143.69 (J/K)

Oxygen delta moles = -5.6884e-05 delta grams = -0.00182022
G = 19.76 (J) H = -2.32 (J) S = -0.01 (J/K) V = -7.11 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 96.66 (gm) density = 2.53 (gm/cc) viscosity = 3.61 (log 10 poise) (analysis in wt %)
G = -1581583.23 (J) H = -1183754.93 (J) S = 266.44 (J/K) V = 38.21 (cc) Cp = 139.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.27 | 0.83 | 13.73 | 1.30 | 0.00 | 6.24 | 0.09 | 2.95 | 0.00 | 0.00 | 4.29 | 3.50 | 2.58 | 0.18 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.33 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.45Mg1.45Fe'''0.02Ti0.00Al0.08Si1.95O6
G = -52169.04 (J) H = -40077.52 (J) S = 8.10 (J/K) V = 1.01 (cc) Cp = 4.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -46.71 | 95.73 | 45.34 | 2.97 | -2.69 | 5.14 | 0.23 |

Total solids mass = 3.33 (gm) density = 3.29 (gm/cc)
G = -52169.04 (J) H = -40077.52 (J) S = 8.10 (J/K) V = 1.01 (cc) Cp = 4.16 (J/K)

Viscosity of the System: 3.65 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1633752.27 (J) H = -1223832.44 (J) S = 274.53 (J/K) V = 39.22 (cc) Cp = 143.38 (J/K)

Oxygen delta moles = -9.12205e-05 delta grams = -0.00291895
G = 31.44 (J) H = -3.68 (J) S = -0.02 (J/K) V = -11.32 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 95.83 (gm) density = 2.53 (gm/cc) viscosity = 3.69 (log 10 poise) (analysis in wt %)
G = -1566137.87 (J) H = -1175670.60 (J) S = 263.27 (J/K) V = 37.89 (cc) Cp = 137.90 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.36 0.84 13.83 1.29 0.00 6.15 0.09 2.76 0.00 0.00 4.31 3.53 2.61 0.18 1.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.17 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.47Mg1.43Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -64854.33 (J) H = -49909.03 (J) S = 10.08 (J/K) V = 1.26 (cc) Cp = 5.18 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-48.20 95.49 46.94 3.05 -2.76 5.24 0.24

Total solids mass = 4.17 (gm) density = 3.30 (gm/cc)
G = -64854.33 (J) H = -49909.03 (J) S = 10.08 (J/K) V = 1.26 (cc) Cp = 5.18 (J/K)

Viscosity of the System: 3.75 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1630992.20 (J) H = -1225579.63 (J) S = 273.35 (J/K) V = 39.16 (cc) Cp = 143.08 (J/K)

Oxygen delta moles = -0.000128355 delta grams = -0.00410721
G = 43.91 (J) H = -5.13 (J) S = -0.03 (J/K) V = -15.83 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 95.01 (gm) density = 2.53 (gm/cc) viscosity = 3.78 (log 10 poise) (analysis in wt %)
G = -1551141.42 (J) H = -1167835.36 (J) S = 260.19 (J/K) V = 37.58 (cc) Cp = 130.59 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.45 0.85 13.93 1.28 0.00 6.06 0.10 2.58 0.00 0.00 4.34 3.56 2.63 0.18 1.06 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.98 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.49Mg1.41Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -77100.87 (J) H = -59435.80 (J) S = 11.99 (J/K) V = 1.51 (cc) Cp = 6.17 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-49.72 95.25 48.57 3.12 -2.83 5.36 0.25

Total solids mass = 4.98 (gm) density = 3.31 (gm/cc)
G = -77100.87 (J) H = -59435.80 (J) S = 11.99 (J/K) V = 1.51 (cc) Cp = 6.17 (J/K)

Viscosity of the System: 3.85 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1628242.29 (J) H = -1227271.16 (J) S = 272.19 (J/K) V = 39.09 (cc) Cp = 136.76 (J/K)

Oxygen delta moles = -0.000168463 delta grams = -0.00539063
G = 57.20 (J) H = -6.67 (J) S = -0.04 (J/K) V = -20.63 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1190.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.68  delta HM = -4.86  NNO = 0.00  QFM = 0.29  COH = 2.22  IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.21 (gm)  density = 2.53 (gm/cc)  viscosity = 3.87 (log 10 poise)  (analysis in wt %)
G = -1536551.25 (J)  H = -1160242.24 (J)  S = 257.19 (J/K)  V = 37.28 (cc)  Cp = 129.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.55 | 0.85 | 14.03 | 1.27 | 0.00 | 5.95 | 0.10 | 2.40 | 0.00 | 0.00 | 4.36 | 3.59 | 2.65 | 0.18 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.78 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.50Mg1.39Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -88950.90 (J)  H = -68688.65 (J)  S = 13.85 (J/K)  V = 1.74 (cc)  Cp = 7.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -51.26 | 95.00 | 50.24 | 3.20 | -2.91 | 5.47 | 0.26 |

Total solids  mass = 5.78 (gm)  density = 3.31 (gm/cc)
G = -88950.90 (J)  H = -68688.65 (J)  S = 13.85 (J/K)  V = 1.74 (cc)  Cp = 7.13 (J/K)

Viscosity of the System: 3.95 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.56 (gm/cc)
G = -1625502.15 (J)  H = -1228930.89 (J)  S = 271.04 (J/K)  V = 39.03 (cc)  Cp = 136.48 (J/K)

Oxygen  delta moles = -0.000211735  delta grams = -0.00677525
G = 71.35 (J)  H = -8.31 (J)  S = -0.05 (J/K)  V = -25.76 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1180.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.80  delta HM = -4.86  NNO = 0.00  QFM = 0.28  COH = 2.20  IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.43 (gm)  density = 2.53 (gm/cc)  viscosity = 3.96 (log 10 poise)  (analysis in wt %)
G = -1522336.29 (J)  H = -1152888.70 (J)  S = 254.24 (J/K)  V = 36.99 (cc)  Cp = 128.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.64 | 0.86 | 14.13 | 1.25 | 0.00 | 5.84 | 0.10 | 2.24 | 0.00 | 0.00 | 4.38 | 3.62 | 2.67 | 0.18 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.56 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.52Mg1.37Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -100435.38 (J)  H = -77690.05 (J)  S = 15.65 (J/K)  V = 1.97 (cc)  Cp = 8.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.83 | 94.73 | 51.94 | 3.29 | -2.99 | 5.59 | 0.27 |

Total solids  mass = 6.56 (gm)  density = 3.32 (gm/cc)

G = -100435.38 (J)  H = -77690.05 (J)  S = 15.65 (J/K)  V = 1.97 (cc)  Cp = 8.07 (J/K)

Viscosity of the System: 4.05 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.57 (gm/cc)
G = -1622771.68 (J)  H = -1230578.74 (J)  S = 269.89 (J/K)  V = 38.96 (cc)  Cp = 136.22 (J/K)

Oxygen  delta moles = -0.000258315  delta grams = -0.00826576
G = 86.38 (J)  H = -10.04 (J)  S = -0.07 (J/K)  V = -31.21 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1170.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.91  delta HM = -4.87  NNO = 0.00  QFM = 0.27  COH = 2.18  IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid  mass = 92.66 (gm)  density = 2.52 (gm/cc)  viscosity = 4.05 (log 10 poise)  (analysis in wt %)
G = -1508469.57 (J)  H = -1145755.86 (J)  S = 251.33 (J/K)  V = 36.70 (cc)  Cp = 126.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.74 | 0.87 | 14.22 | 1.24 | 0.00 | 5.72 | 0.10 | 2.09 | 0.00 | 0.00 | 4.41 | 3.65 | 2.70 | 0.18 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 7.33 (gm)  density = 3.33 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.54Mg1.35Fe'"0.03Ti0.00Al0.09Si1.94O6
G = -111581.26 (J)  H = -86459.61 (J)  S = 17.41 (J/K)  V = 2.20 (cc)  Cp = 8.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.41 | 94.46 | 53.66 | 3.37 | -3.07 | 5.71 | 0.28 |

Total solids  mass = 7.33 (gm)  density = 3.33 (gm/cc)
G = -111581.26 (J)  H = -86459.61 (J)  S = 17.41 (J/K)  V = 2.20 (cc)  Cp = 8.99 (J/K)

Viscosity of the System: 4.15 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.57 (gm/cc)
G = -1620050.83 (J)  H = -1232215.47 (J)  S = 268.74 (J/K)  V = 38.90 (cc)  Cp = 135.96 (J/K)

Oxygen  delta moles = -0.000308327  delta grams = -0.00986611
G = 102.32 (J)  H = -11.87 (J)  S = -0.08 (J/K)  V = -37.00 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1160.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.27  COH = 2.17  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 91.90 (gm)  density = 2.52 (gm/cc)  viscosity = 4.14 (log 10 poise)  (analysis in wt %)
G = -1494927.55 (J)  H = -1138827.15 (J)  S = 248.47 (J/K)  V = 36.42 (cc)  Cp = 125.81 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

63.85 0.87 14.32 1.22 0.00 5.60 0.10 1.94 0.00 0.00 4.43 3.68 2.72 0.19 1.10 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.09 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.55Mg1.33Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -122412.03 (J) H = -95014.56 (J) S = 19.12 (J/K) V = 2.42 (cc) Cp = 9.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.01 | 94.18 | 55.39 | 3.47 | -3.16 | 5.84 | 0.29 |

Total solids mass = 8.09 (gm) density = 3.34 (gm/cc)
G = -122412.03 (J) H = -95014.56 (J) S = 19.12 (J/K) V = 2.42 (cc) Cp = 9.89 (J/K)

Viscosity of the System: 4.25 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1617339.57 (J) H = -1233841.71 (J) S = 267.59 (J/K) V = 38.84 (cc) Cp = 135.70 (J/K)

Oxygen delta moles = -0.000361873 delta grams = -0.0115795
G = 119.16 (J) H = -13.80 (J) S = -0.09 (J/K) V = -43.12 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 91.15 (gm) density = 2.52 (gm/cc) viscosity = 4.23 (log 10 poise) (analysis in wt %)
G = -1481690.14 (J) H = -1132088.31 (J) S = 245.65 (J/K) V = 36.14 (cc) Cp = 124.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.96 | 0.88 | 14.41 | 1.20 | 0.00 | 5.46 | 0.10 | 1.80 | 0.00 | 0.00 | 4.44 | 3.71 | 2.74 | 0.19 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.84 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.57Mg1.30Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -132947.76 (J) H = -103369.68 (J) S = 20.78 (J/K) V = 2.64 (cc) Cp = 10.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.62 | 93.89 | 57.14 | 3.56 | -3.26 | 5.97 | 0.31 |

Total solids mass = 8.84 (gm) density = 3.35 (gm/cc)
G = -132947.76 (J) H = -103369.68 (J) S = 20.78 (J/K) V = 2.64 (cc) Cp = 10.77 (J/K)

Viscosity of the System: 4.36 (log 10 poise)

System mass = 99.99 (gm) density = 2.58 (gm/cc)
G = -1614637.90 (J) H = -1235457.99 (J) S = 266.44 (J/K) V = 38.78 (cc) Cp = 135.45 (J/K)

Oxygen delta moles = -0.000419025 delta grams = -0.0134083
G = 136.90 (J) H = -15.83 (J) S = -0.11 (J/K) V = -49.58 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1140.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.26  COH = 2.13  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 90.41 (gm)  density = 2.52 (gm/cc)  viscosity = 4.32 (log 10 poise)  (analysis in wt %)
G = -1468740.60 (J)  H = -1125527.36 (J)  S = 242.87 (J/K)  V = 35.87 (cc)  Cp = 123.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.07 | 0.89 | 14.51 | 1.18 | 0.00 | 5.32 | 0.10 | 1.67 | 0.00 | 0.00 | 4.46 | 3.74 | 2.76 | 0.19 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.58 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.59Mg1.28Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -143205.21 (J)  H = -111537.38 (J)  S = 22.41 (J/K)  V = 2.85 (cc)  Cp = 11.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.23 | 93.60 | 58.89 | 3.66 | -3.36 | 6.11 | 0.32 |

Total solids  mass = 9.58 (gm)  density = 3.36 (gm/cc)
G = -143205.21 (J)  H = -111537.38 (J)  S = 22.41 (J/K)  V = 2.85 (cc)  Cp = 11.63 (J/K)

Viscosity of the System: 4.46 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.58 (gm/cc)
G = -1611945.81 (J)  H = -1237064.74 (J)  S = 265.28 (J/K)  V = 38.72 (cc)  Cp = 135.20 (J/K)

Oxygen  delta moles = -0.000479831  delta grams = -0.015354
G = 155.54 (J)  H = -17.95 (J)  S = -0.12 (J/K)  V = -56.38 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1130.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.25  COH = 2.11  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.68 (gm)  density = 2.52 (gm/cc)  viscosity = 4.42 (log 10 poise)  (analysis in wt %)
G = -1456065.48 (J)  H = -1119134.51 (J)  S = 240.12 (J/K)  V = 35.60 (cc)  Cp = 122.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.19 | 0.89 | 14.60 | 1.16 | 0.00 | 5.17 | 0.10 | 1.55 | 0.00 | 0.00 | 4.48 | 3.77 | 2.79 | 0.19 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.30 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.61Mg1.26Fe'"0.03Ti0.00Al0.10Si1.93O6
G = -153197.86 (J)  H = -119527.77 (J)  S = 24.00 (J/K)  V = 3.06 (cc)  Cp = 12.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.83 | 93.30 | 60.64 | 3.77 | -3.46 | 6.25 | 0.33 |

Total solids  mass = 10.30 (gm)  density = 3.37 (gm/cc)
G = -153197.86 (J)  H = -119527.77 (J)  S = 24.00 (J/K)  V = 3.06 (cc)  Cp = 12.47 (J/K)

Viscosity of the System: 4.57 (log 10 poise)

System mass = 99.98 (gm) density = 2.59 (gm/cc)
G = -1609263.34 (J) H = -1238662.27 (J) S = 264.12 (J/K) V = 38.66 (cc) Cp = 134.96 (J/K)

Oxygen delta moles = -0.000544303 delta grams = -0.017417
G = 175.05 (J) H = -20.17 (J) S = -0.14 (J/K) V = -63.50 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1120.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.25 COH = 2.09 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 88.45 (gm) density = 2.51 (gm/cc) viscosity = 4.53 (log 10 poise) (analysis in wt %)
G = -1436769.22 (J) H = -1107802.86 (J) S = 236.13 (J/K) V = 35.17 (cc) Cp = 120.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.43 | 0.90 | 14.72 | 1.11 | 0.00 | 4.91 | 0.10 | 1.44 | 0.00 | 0.00 | 4.42 | 3.82 | 2.82 | 0.19 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.26 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.62Mg1.24Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -107517.57 (J) H = -84056.57 (J) S = 16.84 (J/K) V = 2.15 (cc) Cp = 8.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.05 | 93.15 | 61.88 | 3.89 | -3.57 | 6.36 | 0.34 |

clinopyroxene mass = 4.27 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.14Fe"0.65Mg1.10Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -62299.94 (J) H = -48514.06 (J) S = 9.90 (J/K) V = 1.26 (cc) Cp = 5.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.91 | 84.68 | 65.26 | 4.88 | -4.28 | 8.43 | 0.94 |

Total solids mass = 11.53 (gm) density = 3.37 (gm/cc)
G = -169817.51 (J) H = -132570.63 (J) S = 26.74 (J/K) V = 3.42 (cc) Cp = 13.82 (J/K)

Viscosity of the System: 4.70 (log 10 poise)

System mass = 99.98 (gm) density = 2.59 (gm/cc)
G = -1606586.73 (J) H = -1240373.50 (J) S = 262.87 (J/K) V = 38.59 (cc) Cp = 134.55 (J/K)

Oxygen delta moles = -0.000619813 delta grams = -0.0198333
G = 197.75 (J) H = -22.74 (J) S = -0.16 (J/K) V = -71.79 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1110.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.24 COH = 2.07 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 86.90 (gm) density = 2.51 (gm/cc) viscosity = 4.66 (log 10 poise) (analysis in wt %)
G = -1413194.76 (J) H = -1093202.95 (J) S = 231.35 (J/K) V = 34.64 (cc) Cp = 118.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.76 | 0.91 | 14.87 | 1.04 | 0.00 | 4.57 | 0.10 | 1.33 | 0.00 | 0.00 | 4.30 | 3.88 | 2.87 | 0.20 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.77 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.63Mg1.23Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -26095.88 (J) H = -20447.33 (J) S = 4.08 (J/K) V = 0.52 (cc) Cp = 2.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.96 | 93.13 | 62.71 | 4.02 | -3.68 | 6.44 | 0.36 |

clinopyroxene mass = 11.30 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.66Mg1.09Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -164629.68 (J) H = -128506.17 (J) S = 26.12 (J/K) V = 3.34 (cc) Cp = 13.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.22 | 84.22 | 65.82 | 5.05 | -4.42 | 8.55 | 1.00 |

Total solids mass = 13.07 (gm) density = 3.38 (gm/cc)
G = -190725.55 (J) H = -148953.50 (J) S = 30.20 (J/K) V = 3.87 (cc) Cp = 15.50 (J/K)

Viscosity of the System: 4.85 (log 10 poise)

System mass = 99.98 (gm) density = 2.60 (gm/cc)
G = -1603920.31 (J) H = -1242156.45 (J) S = 261.55 (J/K) V = 38.51 (cc) Cp = 134.03 (J/K)

Oxygen delta moles = -0.000700705 delta grams = -0.0224217
G = 221.77 (J) H = -25.46 (J) S = -0.18 (J/K) V = -80.58 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1100.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.05 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 85.80 (gm) density = 2.51 (gm/cc) viscosity = 4.77 (log 10 poise) (analysis in wt %)
G = -1395620.19 (J) H = -1082957.83 (J) S = 227.70 (J/K) V = 34.25 (cc) Cp = 116.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.00 | 0.92 | 14.98 | 1.00 | 0.00 | 4.33 | 0.11 | 1.23 | 0.00 | 0.00 | 4.23 | 3.92 | 2.91 | 0.20 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 14.18 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.67Mg1.06Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -205651.06 (J) H = -160882.39 (J) S = 32.60 (J/K) V = 4.19 (cc) Cp = 16.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.48 | 83.28 | 66.68 | 5.25 | -4.58 | 8.76 | 1.09 |

Total solids mass = 14.18 (gm) density = 3.39 (gm/cc)
G = -205651.06 (J) H = -160882.39 (J) S = 32.60 (J/K) V = 4.19 (cc) Cp = 16.71 (J/K)

Viscosity of the System: 4.99 (log 10 poise)

System mass = 99.98 (gm) density = 2.60 (gm/cc)
G = -1601271.25 (J) H = -1243840.22 (J) S = 260.30 (J/K) V = 38.43 (cc) Cp = 133.64 (J/K)

Oxygen delta moles = -0.000773567 delta grams = -0.0247532
G = 242.86 (J) H = -27.82 (J) S = -0.20 (J/K) V = -88.32 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 84.89 (gm) density = 2.50 (gm/cc) viscosity = 4.88 (log 10 poise) (analysis in wt %)
G = -1380776.27 (J) H = -1074676.21 (J) S = 224.55 (J/K) V = 33.92 (cc) Cp = 115.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.19 | 0.93 | 15.08 | 0.96 | 0.00 | 4.13 | 0.11 | 1.13 | 0.00 | 0.00 | 4.18 | 3.96 | 2.94 | 0.20 | 1.19 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 15.08 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.68Mg1.04Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -217859.97 (J) H = -170804.34 (J) S = 34.52 (J/K) V = 4.44 (cc) Cp = 17.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.54 | 82.00 | 67.61 | 5.46 | -4.75 | 9.03 | 1.19 |

Total solids mass = 15.08 (gm) density = 3.39 (gm/cc)
G = -217859.97 (J) H = -170804.34 (J) S = 34.52 (J/K) V = 4.44 (cc) Cp = 17.72 (J/K)

Viscosity of the System: 5.11 (log 10 poise)

System mass = 99.97 (gm) density = 2.61 (gm/cc)
G = -1598636.24 (J) H = -1245480.54 (J) S = 259.07 (J/K) V = 38.37 (cc) Cp = 133.33 (J/K)

Oxygen delta moles = -0.000843298 delta grams = -0.0269845
G = 262.60 (J) H = -30.03 (J) S = -0.21 (J/K) V = -95.58 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1080.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.22 COH = 2.01 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 83.98 (gm) density = 2.50 (gm/cc) viscosity = 5.00 (log 10 poise) (analysis in wt %)
G = -1365960.81 (J) H = -1066350.65 (J) S = 221.42 (J/K) V = 33.60 (cc) Cp = 114.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.38 | 0.93 | 15.18 | 0.92 | 0.00 | 3.93 | 0.11 | 1.04 | 0.00 | 0.00 | 4.13 | 4.00 | 2.97 | 0.20 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 15.99 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.68Mg1.01Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -230052.73 (J) H = -180768.83 (J) S = 36.42 (J/K) V = 4.70 (cc) Cp = 18.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.39 | 80.62 | 68.40 | 5.68 | -4.92 | 9.30 | 1.31 |

Total solids mass = 15.99 (gm) density = 3.40 (gm/cc)
G = -230052.73 (J) H = -180768.83 (J) S = 36.42 (J/K) V = 4.70 (cc) Cp = 18.72 (J/K)

Viscosity of the System: 5.24 (log 10 poise)

System mass = 99.97 (gm) density = 2.61 (gm/cc)
G = -1596013.54 (J) H = -1247119.49 (J) S = 257.84 (J/K) V = 38.30 (cc) Cp = 133.01 (J/K)

Oxygen delta moles = -0.000913096 delta grams = -0.029218
G = 282.02 (J) H = -32.18 (J) S = -0.23 (J/K) V = -102.73 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1070.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.22 COH = 1.99 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 80.07 (gm) density = 2.49 (gm/cc) viscosity = 5.09 (log 10 poise) (analysis in wt %)
G = -1301595.34 (J) H = -1018787.95 (J) S = 210.56 (J/K) V = 32.11 (cc) Cp = 108.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.86 | 0.98 | 14.94 | 0.90 | 0.00 | 3.77 | 0.11 | 0.94 | 0.00 | 0.00 | 3.99 | 3.95 | 3.10 | 0.21 | 1.26 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 16.98 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.71Mg0.99Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -242700.43 (J) H = -191014.27 (J) S = 38.48 (J/K) V = 4.98 (cc) Cp = 19.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.63 | 80.80 | 70.56 | 5.56 | -4.77 | 9.15 | 1.32 |

feldspar mass = 2.91 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.58Ca0.39Al1.39Si2.61O8
G = -49073.15 (J) H = -39714.58 (J) S = 6.97 (J/K) V = 1.11 (cc) Cp = 3.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 57.74 | 39.04 | 3.22 |

Total solids mass = 19.90 (gm) density = 3.27 (gm/cc)
G = -291773.58 (J) H = -230728.85 (J) S = 45.45 (J/K) V = 6.09 (cc) Cp = 23.37 (J/K)

Viscosity of the System: 5.43 (log 10 poise)

System mass = 99.97 (gm) density = 2.62 (gm/cc)
G = -1593368.92 (J) H = -1249516.79 (J) S = 256.00 (J/K) V = 38.20 (cc) Cp = 132.11 (J/K)

Oxygen delta moles = -0.00105183 delta grams = -0.0336573

G = 322.19 (J)  H = -36.69 (J)  S = -0.27 (J/K)  V = -117.46 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1060.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.21  COH = 1.97  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 76.50 (gm)  density = 2.49 (gm/cc)  viscosity = 5.19 (log 10 poise)  (analysis in wt %)
G = -1242864.07 (J)  H = -975416.27 (J)  S = 200.61 (J/K)  V = 30.75 (cc)  Cp = 103.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.31 | 1.02 | 14.71 | 0.86 | 0.00 | 3.60 | 0.12 | 0.86 | 0.00 | 0.00 | 3.87 | 3.89 | 3.22 | 0.22 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 17.89 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.73Mg0.98Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -254130.88 (J)  H = -200352.59 (J)  S = 40.34 (J/K)  V = 5.23 (cc)  Cp = 20.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.61 | 80.91 | 72.56 | 5.44 | -4.62 | 9.00 | 1.33 |

feldspar  mass = 5.57 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.03Na0.59Ca0.38Al1.38Si2.62O8
G = -93748.01 (J)  H = -76031.31 (J)  S = 13.29 (J/K)  V = 2.13 (cc)  Cp = 6.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.67 | 37.90 | 3.42 |

Total solids  mass = 23.47 (gm)  density = 3.19 (gm/cc)
G = -347878.89 (J)  H = -276383.90 (J)  S = 53.63 (J/K)  V = 7.36 (cc)  Cp = 27.60 (J/K)

Viscosity of the System: 5.61 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.62 (gm/cc)
G = -1590742.97 (J)  H = -1251800.18 (J)  S = 254.24 (J/K)  V = 38.11 (cc)  Cp = 131.30 (J/K)

Oxygen  delta moles = -0.00118938  delta grams = -0.0380586
G = 361.30 (J)  H = -41.06 (J)  S = -0.30 (J/K)  V = -131.83 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1050.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.20  COH = 1.95  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 73.18 (gm)  density = 2.48 (gm/cc)  viscosity = 5.28 (log 10 poise)  (analysis in wt %)
G = -1188465.72 (J)  H = -935230.10 (J)  S = 191.39 (J/K)  V = 29.49 (cc)  Cp = 99.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.76 | 1.06 | 14.49 | 0.83 | 0.00 | 3.42 | 0.12 | 0.79 | 0.00 | 0.00 | 3.75 | 3.82 | 3.34 | 0.23 | 1.38 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 18.73 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.74Mg0.96Fe'"0.04Ti0.00Al0.15Si1.90O6
G = -264471.75 (J) H = -208880.13 (J) S = 42.01 (J/K) V = 5.47 (cc) Cp = 21.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.38 | 80.96 | 74.41 | 5.32 | -4.48 | 8.84 | 1.33 |

feldspar mass = 8.05 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.60Ca0.37Al1.37Si2.63O8
G = -135197.40 (J) H = -109882.42 (J) S = 19.13 (J/K) V = 3.07 (cc) Cp = 9.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.52 | 36.85 | 3.63 |

Total solids mass = 26.78 (gm) density = 3.14 (gm/cc)
G = -399669.15 (J) H = -318762.55 (J) S = 61.15 (J/K) V = 8.54 (cc) Cp = 31.52 (J/K)

Viscosity of the System: 5.80 (log 10 poise)

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1588134.88 (J) H = -1253992.65 (J) S = 252.54 (J/K) V = 38.03 (cc) Cp = 130.54 (J/K)

Oxygen delta moles = -0.00132615 delta grams = -0.0424352
G = 399.49 (J) H = -45.30 (J) S = -0.34 (J/K) V = -145.89 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1040.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.93 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 70.10 (gm) density = 2.48 (gm/cc) viscosity = 5.38 (log 10 poise) (analysis in wt %)
G = -1138106.62 (J) H = -898017.24 (J) S = 182.83 (J/K) V = 28.31 (cc) Cp = 94.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.19 | 1.11 | 14.28 | 0.79 | 0.00 | 3.24 | 0.13 | 0.72 | 0.00 | 0.00 | 3.65 | 3.75 | 3.46 | 0.24 | 1.44 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 19.50 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.76Mg0.94Fe'"0.04Ti0.00Al0.15Si1.90O6
G = -273816.12 (J) H = -216668.16 (J) S = 43.52 (J/K) V = 5.68 (cc) Cp = 22.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.95 | 80.97 | 76.12 | 5.21 | -4.34 | 8.66 | 1.34 |

feldspar mass = 10.35 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.60Ca0.36Al1.36Si2.64O8
G = -173621.87 (J) H = -141415.83 (J) S = 24.53 (J/K) V = 3.95 (cc) Cp = 12.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.29 | 35.87 | 3.83 |

Total solids mass = 29.85 (gm) density = 3.10 (gm/cc)
G = -447437.99 (J) H = -358083.99 (J) S = 68.05 (J/K) V = 9.63 (cc) Cp = 35.14 (J/K)

Viscosity of the System: 5.99 (log 10 poise)

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1585544.61 (J) H = -1256101.24 (J) S = 250.88 (J/K) V = 37.94 (cc) Cp = 129.84 (J/K)

Oxygen delta moles = -0.00146125 delta grams = -0.0467584
G = 436.48 (J) H = -49.39 (J) S = -0.37 (J/K) V = -159.54 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1030.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.19 COH = 1.91 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 67.25 (gm) density = 2.47 (gm/cc) viscosity = 5.47 (log 10 poise) (analysis in wt %)
G = -1091498.26 (J) H = -863568.64 (J) S = 174.91 (J/K) V = 27.22 (cc) Cp = 90.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.61 | 1.15 | 14.07 | 0.75 | 0.00 | 3.05 | 0.13 | 0.67 | 0.00 | 0.00 | 3.56 | 3.67 | 3.58 | 0.25 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 20.20 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.78Mg0.93Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -282248.81 (J) H = -223780.99 (J) S = 44.87 (J/K) V = 5.87 (cc) Cp = 23.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.32 | 80.93 | 77.67 | 5.11 | -4.21 | 8.47 | 1.35 |

feldspar mass = 12.49 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.61Ca0.35Al1.35Si2.65O8
G = -209225.02 (J) H = -170784.09 (J) S = 29.50 (J/K) V = 4.77 (cc) Cp = 15.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.99 | 34.97 | 4.04 |

Total solids mass = 32.70 (gm) density = 3.07 (gm/cc)
G = -491473.83 (J) H = -394565.08 (J) S = 74.37 (J/K) V = 10.64 (cc) Cp = 38.59 (J/K)

Viscosity of the System: 6.19 (log 10 poise)

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1582972.10 (J) H = -1258133.72 (J) S = 249.27 (J/K) V = 37.87 (cc) Cp = 129.30 (J/K)

Oxygen delta moles = -0.00159387 delta grams = -0.0510019
G = 472.06 (J) H = -53.30 (J) S = -0.40 (J/K) V = -172.69 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1020.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.89 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 64.61 (gm) density = 2.47 (gm/cc) viscosity = 5.56 (log 10 poise) (analysis in wt %)
G = -1048360.06 (J) H = -831680.47 (J) S = 167.56 (J/K) V = 26.21 (cc) Cp = 87.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.01 | 1.20 | 13.88 | 0.71 | 0.00 | 2.86 | 0.14 | 0.61 | 0.00 | 0.00 | 3.47 | 3.58 | 3.70 | 0.26 | 1.56 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 20.85 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.79Mg0.92Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -289849.26 (J) H = -230278.34 (J) S = 46.07 (J/K) V = 6.05 (cc) Cp = 23.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.49 | 80.86 | 79.08 | 5.00 | -4.08 | 8.27 | 1.36 |

feldspar mass = 14.48 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.34Al1.34Si2.66O8
G = -242207.98 (J) H = -198137.06 (J) S = 34.08 (J/K) V = 5.53 (cc) Cp = 17.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.63 | 34.14 | 4.24 |

Total solids mass = 35.33 (gm) density = 3.05 (gm/cc)
G = -532057.24 (J) H = -428415.40 (J) S = 80.15 (J/K) V = 11.58 (cc) Cp = 41.70 (J/K)

Viscosity of the System: 6.39 (log 10 poise)

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1580417.30 (J) H = -1260095.87 (J) S = 247.71 (J/K) V = 37.79 (cc) Cp = 128.72 (J/K)

Oxygen delta moles = -0.00172327 delta grams = -0.0551424
G = 506.03 (J) H = -57.01 (J) S = -0.44 (J/K) V = -185.28 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1010.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.86 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 62.17 (gm) density = 2.46 (gm/cc) viscosity = 5.65 (log 10 poise) (analysis in wt %)
G = -1008428.58 (J) H = -802161.53 (J) S = 160.75 (J/K) V = 25.27 (cc) Cp = 83.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.40 | 1.24 | 13.70 | 0.67 | 0.00 | 2.68 | 0.15 | 0.57 | 0.00 | 0.00 | 3.39 | 3.49 | 3.81 | 0.28 | 1.62 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 21.44 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.80Mg0.91Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -296692.86 (J) H = -236216.53 (J) S = 47.13 (J/K) V = 6.21 (cc) Cp = 24.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.48 | 80.75 | 80.35 | 4.90 | -3.95 | 8.06 | 1.37 |

feldspar mass = 16.33 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.33Al1.33Si2.67O8
G = -272758.68 (J) H = -223615.47 (J) S = 38.30 (J/K) V = 6.24 (cc) Cp = 20.01 (J/K)

albite anorthite sanidine
62.20 33.36 4.44

Total solids mass = 37.77 (gm) density = 3.03 (gm/cc)
G = -569451.53 (J) H = -459832.00 (J) S = 85.43 (J/K) V = 12.45 (cc) Cp = 44.56 (J/K)

Viscosity of the System: 6.59 (log 10 poise)

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1577880.12 (J) H = -1261993.53 (J) S = 246.18 (J/K) V = 37.72 (cc) Cp = 128.17 (J/K)

Oxygen delta moles = -0.00184882 delta grams = -0.0591601
G = 538.23 (J) H = -60.50 (J) S = -0.47 (J/K) V = -197.24 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 1000.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.17 COH = 1.84 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 59.91 (gm) density = 2.46 (gm/cc) viscosity = 5.74 (log 10 poise) (analysis in wt %)
G = -971450.61 (J) H = -774827.62 (J) S = 154.44 (J/K) V = 24.40 (cc) Cp = 80.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.78 | 1.28 | 13.53 | 0.63 | 0.00 | 2.50 | 0.15 | 0.53 | 0.00 | 0.00 | 3.32 | 3.40 | 3.92 | 0.29 | 1.68 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 21.97 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.18Fe"0.81Mg0.89Fe"'0.04Ti0.00Al0.14Si1.91O6
G = -302851.39 (J) H = -241648.88 (J) S = 48.07 (J/K) V = 6.35 (cc) Cp = 25.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.30 | 80.61 | 81.48 | 4.81 | -3.83 | 7.85 | 1.38 |

feldspar mass = 18.06 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.63Ca0.33Al1.33Si2.67O8
G = -301058.44 (J) H = -247355.81 (J) S = 42.18 (J/K) V = 6.90 (cc) Cp = 22.10 (J/K)

albite anorthite sanidine
62.73 32.64 4.63

Total solids mass = 40.03 (gm) density = 3.02 (gm/cc)
G = -603909.83 (J) H = -489004.69 (J) S = 90.25 (J/K) V = 13.26 (cc) Cp = 47.20 (J/K)

Viscosity of the System: 6.80 (log 10 poise)

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1575360.44 (J) H = -1263832.31 (J) S = 244.69 (J/K) V = 37.66 (cc) Cp = 127.65 (J/K)

Oxygen delta moles = -0.00197004 delta grams = -0.063039
G = 568.55 (J) H = -63.76 (J) S = -0.50 (J/K) V = -208.54 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 990.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.16  COH = 1.82  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 57.82 (gm)  density = 2.45 (gm/cc)  viscosity = 5.83 (log 10 poise)  (analysis in wt %)
G = -937159.95 (J)  H = -749453.51 (J)  S = 148.60 (J/K)  V = 23.59 (cc)  Cp = 77.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.12 | 1.33 | 13.34 | 0.60 | 0.00 | 2.34 | 0.16 | 0.49 | 0.00 | 0.00 | 3.26 | 3.30 | 4.03 | 0.30 | 1.74 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.23 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.84Mg1.03Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -17022.93 (J)  H = -13637.71 (J)  S = 2.68 (J/K)  V = 0.36 (cc)  Cp = 1.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.05 | 93.62 | 83.72 | 3.87 | -3.46 | 5.94 | 0.36 |

clinopyroxene  mass = 21.15 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.19Fe"0.83Mg0.88Fe'"0.04Ti0.01Al0.14Si1.91O6
G = -290283.97 (J)  H = -232132.10 (J)  S = 46.04 (J/K)  V = 6.11 (cc)  Cp = 24.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.73 | 80.06 | 82.59 | 4.72 | -3.71 | 7.66 | 1.40 |

feldspar  mass = 19.73 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.63Ca0.32Al1.32Si2.68O8
G = -328388.77 (J)  H = -270406.17 (J)  S = 45.90 (J/K)  V = 7.54 (cc)  Cp = 24.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.10 | 32.08 | 4.81 |

Total solids  mass = 42.11 (gm)  density = 3.01 (gm/cc)
G = -635695.66 (J)  H = -516175.98 (J)  S = 94.62 (J/K)  V = 14.00 (cc)  Cp = 49.65 (J/K)

Viscosity of the System: 7.01 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.66 (gm/cc)
G = -1572855.62 (J)  H = -1265629.49 (J)  S = 243.22 (J/K)  V = 37.59 (cc)  Cp = 127.19 (J/K)

Oxygen  delta moles = -0.0020913  delta grams = -0.0669192
G = 598.28 (J)  H = -66.93 (J)  S = -0.53 (J/K)  V = -219.63 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 980.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.15  COH = 1.80  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 55.92 (gm)  density = 2.45 (gm/cc)  viscosity = 5.91 (log 10 poise)  (analysis in wt %)
G = -905738.40 (J)  H = -726215.44 (J)  S = 143.26 (J/K)  V = 22.85 (cc)  Cp = 74.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

69.45 1.37 13.16 0.57 0.00 2.21 0.16 0.44 0.00 0.00 3.21 3.19 4.13 0.31 1.80 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.23 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.86Mg1.01Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -58025.71 (J) H = -46567.97 (J) S = 9.14 (J/K) V = 1.22 (cc) Cp = 4.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.19 | 93.72 | 85.84 | 3.83 | -3.42 | 5.88 | 0.36 |

clinopyroxene mass = 18.00 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.19Fe"0.84Mg0.86Fe'"0.04Ti0.01Al0.14Si1.91O6
G = -245728.85 (J) H = -196889.61 (J) S = 38.97 (J/K) V = 5.19 (cc) Cp = 20.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.81 | 79.61 | 84.20 | 4.64 | -3.60 | 7.54 | 1.42 |

clinopyroxene mass = 0.50 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.41Mg0.61Fe'"0.07Ti0.04Al0.22Si1.84O6
G = -7394.90 (J) H = -6042.81 (J) S = 1.08 (J/K) V = 0.15 (cc) Cp = 0.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.16 | 18.78 | 41.05 | 8.60 | -0.73 | 7.86 | 5.27 |

feldspar mass = 21.27 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.63Ca0.32Al1.32Si2.68O8
G = -353485.61 (J) H = -291713.62 (J) S = 49.29 (J/K) V = 8.13 (cc) Cp = 25.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.45 | 31.55 | 5.00 |

Total solids mass = 44.01 (gm) density = 3.00 (gm/cc)
G = -664635.07 (J) H = -541214.00 (J) S = 98.49 (J/K) V = 14.68 (cc) Cp = 51.89 (J/K)

Viscosity of the System: 7.24 (log 10 poise)

System mass = 99.93 (gm) density = 2.66 (gm/cc)
G = -1570373.47 (J) H = -1267429.44 (J) S = 241.75 (J/K) V = 37.53 (cc) Cp = 126.78 (J/K)

Oxygen delta moles = -0.0021977 delta grams = -0.0703238
G = 623.19 (J) H = -69.55 (J) S = -0.55 (J/K) V = -228.98 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 970.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.15 COH = 1.77 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 54.01 (gm) density = 2.44 (gm/cc) viscosity = 6.02 (log 10 poise) (analysis in wt %)
G = -874413.00 (J) H = -703009.40 (J) S = 137.88 (J/K) V = 22.12 (cc) Cp = 72.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.98 | 1.20 | 13.00 | 0.55 | 0.00 | 2.09 | 0.16 | 0.40 | 0.00 | 0.00 | 3.12 | 3.08 | 4.24 | 0.32 | 1.87 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.72 (gm) density = 3.50 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.06Fe"0.89Mg0.98Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -159088.90 (J) H = -127832.65 (J) S = 25.14 (J/K) V = 3.35 (cc) Cp = 13.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.72 | 93.93 | 89.16 | 3.80 | -3.45 | 5.94 | 0.35 |

clinopyroxene mass = 8.69 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.19Fe"0.87Mg0.83Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -117582.42 (J) H = -94333.56 (J) S = 18.70 (J/K) V = 2.49 (cc) Cp = 9.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.07 | 79.86 | 87.38 | 4.47 | -3.57 | 7.53 | 1.40 |

clinopyroxene mass = 2.50 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.43Mg0.59Fe'"0.07Ti0.03Al0.21Si1.85O6
G = -36482.98 (J) H = -29863.93 (J) S = 5.32 (J/K) V = 0.74 (cc) Cp = 2.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.99 | 18.92 | 42.86 | 7.83 | -0.86 | 7.98 | 5.28 |

feldspar mass = 22.78 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.64Ca0.31Al1.31Si2.69O8
G = -378055.69 (J) H = -312674.05 (J) S = 52.59 (J/K) V = 8.71 (cc) Cp = 27.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.76 | 30.99 | 5.25 |

rhm-oxide mass = 0.23 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.20Al0.11Ti0.84O3
G = -2323.73 (J) H = -1760.32 (J) S = 0.45 (J/K) V = 0.05 (cc) Cp = 0.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.32 | 10.20 | 69.51 | 2.26 | 5.71 |

Total solids mass = 45.92 (gm) density = 2.99 (gm/cc)
G = -693533.73 (J) H = -566464.52 (J) S = 102.22 (J/K) V = 15.35 (cc) Cp = 54.18 (J/K)

Viscosity of the System: 7.50 (log 10 poise)

System mass = 99.93 (gm) density = 2.67 (gm/cc)
G = -1567946.74 (J) H = -1269473.92 (J) S = 240.09 (J/K) V = 37.47 (cc) Cp = 126.36 (J/K)

Oxygen delta moles = -0.00223109 delta grams = -0.0713921
G = 627.04 (J) H = -69.81 (J) S = -0.56 (J/K) V = -230.60 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 52.33 (gm) density = 2.44 (gm/cc) viscosity = 6.12 (log 10 poise) (analysis in wt %)
G = -846795.04 (J) H = -682609.39 (J) S = 133.14 (J/K) V = 21.47 (cc) Cp = 69.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.39 | 1.13 | 12.85 | 0.52 | 0.00 | 1.99 | 0.17 | 0.35 | 0.00 | 0.00 | 3.03 | 2.98 | 4.33 | 0.33 | 1.92 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.80 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.93Mg0.95Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -252696.08 (J) H = -203297.35 (J) S = 40.06 (J/K) V = 5.35 (cc) Cp = 21.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.39 | 94.17 | 92.54 | 3.80 | -3.48 | 6.02 | 0.34 |

clinopyroxene mass = 4.38 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.44Mg0.58Fe'"0.07Ti0.03Al0.21Si1.85O6
G = -63460.02 (J) H = -52040.04 (J) S = 9.26 (J/K) V = 1.29 (cc) Cp = 4.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.85 | 18.62 | 44.36 | 7.58 | -0.74 | 7.97 | 5.36 |

feldspar mass = 24.09 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.05Na0.64Ca0.30Al1.30Si2.70O8
G = -399212.49 (J) H = -330893.87 (J) S = 55.40 (J/K) V = 9.22 (cc) Cp = 29.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.12 | 30.40 | 5.48 |

rhm-oxide mass = 0.34 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.21Al0.11Ti0.84O3
G = -3363.95 (J) H = -2554.13 (J) S = 0.66 (J/K) V = 0.07 (cc) Cp = 0.32 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.65 | 10.26 | 70.25 | 2.31 | 5.54 |

Total solids mass = 47.60 (gm) density = 2.99 (gm/cc)
G = -718732.54 (J) H = -588785.39 (J) S = 105.38 (J/K) V = 15.93 (cc) Cp = 56.18 (J/K)

Viscosity of the System: 7.77 (log 10 poise)

System mass = 99.93 (gm) density = 2.67 (gm/cc)
G = -1565527.59 (J) H = -1271394.77 (J) S = 238.52 (J/K) V = 37.40 (cc) Cp = 126.01 (J/K)

Oxygen delta moles = -0.00227972 delta grams = -0.0729484
G = 634.99 (J) H = -70.52 (J) S = -0.57 (J/K) V = -233.74 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 50.68 (gm) density = 2.43 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -820031.70 (J) H = -662855.28 (J) S = 128.50 (J/K) V = 20.84 (cc) Cp = 67.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.83 | 1.07 | 12.73 | 0.48 | 0.00 | 1.82 | 0.17 | 0.33 | 0.00 | 0.00 | 2.95 | 2.87 | 4.43 | 0.34 | 1.99 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.90 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.93Mg0.94Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -253146.00 (J) H = -204132.81 (J) S = 40.07 (J/K) V = 5.37 (cc) Cp = 21.66 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-94.32 94.32 93.47 3.76 -3.46 5.89 0.33

clinopyroxene mass = 4.64 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.44Mg0.57Fe'"0.07Ti0.03Al0.21Si1.85O6
G = -67202.80 (J) H = -55253.88 (J) S = 9.77 (J/K) V = 1.37 (cc) Cp = 5.19 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
17.90 17.94 44.21 7.51 -0.67 7.70 5.41

feldspar mass = 25.29 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.30Al1.30Si2.70O8
G = -418474.19 (J) H = -347614.72 (J) S = 57.93 (J/K) V = 9.68 (cc) Cp = 30.81 (J/K)
albite anorthite sanidine
64.52 29.77 5.72

rhm-oxide mass = 0.42 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.11Fe'"0.20Al0.11Ti0.85O3
G = -4254.88 (J) H = -3241.21 (J) S = 0.83 (J/K) V = 0.09 (cc) Cp = 0.41 (J/K)
geikielite hematite ilmenite pyrophanite corundum
11.48 9.96 70.76 2.42 5.38

Total solids mass = 49.25 (gm) density = 2.98 (gm/cc)
G = -743077.86 (J) H = -610242.61 (J) S = 108.60 (J/K) V = 16.51 (cc) Cp = 58.07 (J/K)

Viscosity of the System: 8.09 (log 10 poise)

System mass = 99.92 (gm) density = 2.68 (gm/cc)
G = -1563109.56 (J) H = -1273097.89 (J) S = 237.10 (J/K) V = 37.35 (cc) Cp = 125.59 (J/K)

Oxygen delta moles = -0.00235425 delta grams = -0.0753332
G = 649.84 (J) H = -71.98 (J) S = -0.59 (J/K) V = -239.42 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 48.77 (gm) density = 2.43 (gm/cc) viscosity = 6.30 (log 10 poise) (analysis in wt %)
G = -789172.31 (J) H = -639553.09 (J) S = 123.33 (J/K) V = 20.10 (cc) Cp = 64.93 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
71.14 1.02 12.66 0.44 0.00 1.66 0.17 0.31 0.00 0.00 2.86 2.77 4.55 0.35 2.07 0.00 0.00 0.00 0.00

orthopyroxene mass = 18.95 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.94Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -253006.75 (J) H = -204502.62 (J) S = 39.98 (J/K) V = 5.38 (cc) Cp = 21.68 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-95.19 94.48 94.31 3.73 -3.45 5.80 0.32

clinopyroxene mass = 4.94 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.05Ca0.77Fe"0.44Mg0.57Fe'"0.07Ti0.03Al0.20Si1.86O6
G = -71464.94 (J) H = -58912.42 (J) S = 10.35 (J/K) V = 1.45 (cc) Cp = 5.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.94 | 17.28 | 43.98 | 7.49 | -0.61 | 7.47 | 5.47 |

feldspar mass = 26.48 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -437525.53 (J) H = -364230.47 (J) S = 60.42 (J/K) V = 10.14 (cc) Cp = 32.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.84 | 29.16 | 6.00 |

quartz mass = 0.27 (gm) density = 2.55 (gm/cc)
SiO2
G = -4392.80 (J) H = -3697.47 (J) S = 0.57 (J/K) V = 0.10 (cc) Cp = 0.31 (J/K)

rhm-oxide mass = 0.52 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.19Al0.11Ti0.85O3
G = -5149.54 (J) H = -3935.49 (J) S = 1.00 (J/K) V = 0.11 (cc) Cp = 0.49 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.33 | 9.70 | 71.19 | 2.52 | 5.26 |

Total solids mass = 51.15 (gm) density = 2.98 (gm/cc)
G = -771539.56 (J) H = -635278.48 (J) S = 112.32 (J/K) V = 17.18 (cc) Cp = 60.24 (J/K)

Viscosity of the System: 8.52 (log 10 poise)

System mass = 99.92 (gm) density = 2.68 (gm/cc)
G = -1560711.87 (J) H = -1274831.57 (J) S = 235.65 (J/K) V = 37.29 (cc) Cp = 125.17 (J/K)

Oxygen delta moles = -0.00241727 delta grams = -0.0773498
G = 661.18 (J) H = -73.04 (J) S = -0.61 (J/K) V = -243.82 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 46.01 (gm) density = 2.42 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -744181.90 (J) H = -604365.48 (J) S = 116.21 (J/K) V = 19.00 (cc) Cp = 61.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.10 | 0.96 | 12.74 | 0.42 | 0.00 | 1.53 | 0.18 | 0.29 | 0.00 | 0.00 | 2.77 | 2.71 | 4.75 | 0.37 | 2.19 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.92 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.93Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -251885.54 (J) H = -204086.74 (J) S = 39.73 (J/K) V = 5.36 (cc) Cp = 21.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.01 | 94.66 | 94.99 | 3.76 | -3.48 | 5.78 | 0.32 |

clinopyroxene mass = 5.33 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.78Fe"0.44Mg0.57Fe'"0.07Ti0.03Al0.20Si1.86O6
G = -77199.76 (J) H = -63806.71 (J) S = 11.13 (J/K) V = 1.57 (cc) Cp = 5.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.90 | 16.60 | 43.61 | 7.57 | -0.58 | 7.34 | 5.56 |

feldspar mass = 27.79 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -458389.83 (J) H = -382424.56 (J) S = 63.14 (J/K) V = 10.64 (cc) Cp = 33.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.00 | 28.57 | 6.43 |

quartz mass = 1.24 (gm) density = 2.55 (gm/cc)
SiO2
G = -20478.09 (J) H = -17273.73 (J) S = 2.66 (J/K) V = 0.48 (cc) Cp = 1.46 (J/K)

rhm-oxide mass = 0.62 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.19Al0.10Ti0.85O3
G = -6209.10 (J) H = -4760.12 (J) S = 1.20 (J/K) V = 0.14 (cc) Cp = 0.59 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.18 | 9.58 | 71.42 | 2.64 | 5.17 |

Total solids mass = 53.91 (gm) density = 2.96 (gm/cc)
G = -814162.33 (J) H = -672351.86 (J) S = 117.87 (J/K) V = 18.19 (cc) Cp = 63.43 (J/K)

Viscosity of the System: 9.64 (log 10 poise)

System mass = 99.92 (gm) density = 2.69 (gm/cc)
G = -1558344.23 (J) H = -1276717.34 (J) S = 234.07 (J/K) V = 37.20 (cc) Cp = 124.68 (J/K)

Oxygen delta moles = -0.00245286 delta grams = -0.0784885
G = 664.78 (J) H = -73.25 (J) S = -0.61 (J/K) V = -245.37 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 43.49 (gm) density = 2.42 (gm/cc) viscosity = 6.33 (log 10 poise) (analysis in wt %)
G = -703120.61 (J) H = -572213.14 (J) S = 109.72 (J/K) V = 18.00 (cc) Cp = 57.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 71.04 | 0.90 | 12.82 | 0.39 | 0.00 | 1.41 | 0.19 | 0.27 | 0.00 | 0.00 | 2.69 | 2.64 | 4.94 | 0.39 | 2.32 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.89 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.93Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -250806.44 (J) H = -203706.00 (J) S = 39.48 (J/K) V = 5.35 (cc) Cp = 21.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.79 | 94.83 | 95.62 | 3.79 | -3.53 | 5.77 | 0.31 |

clinopyroxene mass = 5.69 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.78Fe"0.43Mg0.56Fe'"0.07Ti0.04Al0.21Si1.86O6
G = -82356.55 (J) H = -68247.09 (J) S = 11.83 (J/K) V = 1.68 (cc) Cp = 6.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.85 | 15.95 | 43.22 | 7.66 | -0.56 | 7.21 | 5.66 |

feldspar mass = 29.00 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.28Al1.28Si2.72O8
G = -477493.94 (J) H = -399223.43 (J) S = 65.60 (J/K) V = 11.10 (cc) Cp = 35.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.12 | 28.01 | 6.87 |

quartz mass = 2.13 (gm) density = 2.55 (gm/cc)
SiO2
G = -35100.92 (J) H = -29671.97 (J) S = 4.55 (J/K) V = 0.83 (cc) Cp = 2.51 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.19Al0.10Ti0.85O3
G = -7113.57 (J) H = -5470.69 (J) S = 1.38 (J/K) V = 0.15 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.04 | 9.44 | 71.66 | 2.76 | 5.10 |

Total solids mass = 56.43 (gm) density = 2.95 (gm/cc)
G = -852871.43 (J) H = -706319.18 (J) S = 122.83 (J/K) V = 19.12 (cc) Cp = 66.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.69 (gm/cc)
G = -1555992.03 (J) H = -1278532.32 (J) S = 232.54 (J/K) V = 37.12 (cc) Cp = 124.24 (J/K)

Oxygen delta moles = -0.00248867 delta grams = -0.0796346
G = 668.27 (J) H = -73.43 (J) S = -0.62 (J/K) V = -246.88 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 41.18 (gm) density = 2.41 (gm/cc) viscosity = 6.34 (log 10 poise) (analysis in wt %)
G = -665423.79 (J) H = -542656.37 (J) S = 103.76 (J/K) V = 17.08 (cc) Cp = 54.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.97 | 0.85 | 12.91 | 0.36 | 0.00 | 1.30 | 0.19 | 0.25 | 0.00 | 0.00 | 2.61 | 2.57 | 5.12 | 0.42 | 2.45 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.87 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.93Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -249763.83 (J) H = -203355.27 (J) S = 39.22 (J/K) V = 5.34 (cc) Cp = 21.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.52 | 95.00 | 96.21 | 3.82 | -3.57 | 5.76 | 0.31 |

clinopyroxene mass = 6.02 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.79Fe"0.43Mg0.56Fe'"0.07Ti0.04Al0.21Si1.86O6
G = -87020.81 (J) H = -72300.79 (J) S = 12.44 (J/K) V = 1.77 (cc) Cp = 6.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.80 | 15.33 | 42.81 | 7.76 | -0.54 | 7.09 | 5.75 |

feldspar mass = 30.12 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.65Ca0.27Al1.27Si2.73O8
G = -495085.68 (J) H = -414825.21 (J) S = 67.84 (J/K) V = 11.53 (cc) Cp = 36.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.20 | 27.47 | 7.33 |

quartz mass = 2.94 (gm) density = 2.55 (gm/cc)
SiO2
G = -48472.63 (J) H = -41063.22 (J) S = 6.26 (J/K) V = 1.15 (cc) Cp = 3.46 (J/K)

rhm-oxide mass = 0.80 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.19Al0.10Ti0.86O3
G = -7888.21 (J) H = -6085.59 (J) S = 1.52 (J/K) V = 0.17 (cc) Cp = 0.75 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.91 | 9.30 | 71.89 | 2.88 | 5.02 |

Total solids mass = 58.74 (gm) density = 2.94 (gm/cc)
G = -888231.16 (J) H = -737630.07 (J) S = 127.29 (J/K) V = 19.97 (cc) Cp = 68.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.70 (gm/cc)
G = -1553654.95 (J) H = -1280286.45 (J) S = 231.05 (J/K) V = 37.04 (cc) Cp = 123.82 (J/K)

Oxygen delta moles = -0.00252454 delta grams = -0.0807823
G = 671.59 (J) H = -73.59 (J) S = -0.63 (J/K) V = -248.34 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 900.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.09 COH = 1.60 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 39.05 (gm) density = 2.41 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -630620.57 (J) H = -515328.14 (J) S = 98.28 (J/K) V = 16.22 (cc) Cp = 52.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.87 | 0.80 | 13.00 | 0.34 | 0.00 | 1.20 | 0.20 | 0.24 | 0.00 | 0.00 | 2.54 | 2.50 | 5.30 | 0.44 | 2.58 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.84 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.97Mg0.92Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -248755.21 (J) H = -203032.01 (J) S = 38.97 (J/K) V = 5.33 (cc) Cp = 21.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.23 | 95.18 | 96.76 | 3.86 | -3.63 | 5.75 | 0.30 |

clinopyroxene mass = 6.32 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.79Fe"0.42Mg0.56Fe'"0.06Ti0.04Al0.21Si1.86O6
G = -91261.73 (J) H = -76022.16 (J) S = 12.99 (J/K) V = 1.86 (cc) Cp = 7.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.73 | 14.74 | 42.39 | 7.88 | -0.53 | 6.96 | 5.84 |

feldspar mass = 31.16 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.65Ca0.27Al1.27Si2.73O8
G = -511373.58 (J) H = -429396.79 (J) S = 69.88 (J/K) V = 11.93 (cc) Cp = 37.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.25 | 26.94 | 7.81 |

quartz mass = 3.69 (gm) density = 2.55 (gm/cc)
SiO2
G = -60768.42 (J) H = -51589.38 (J) S = 7.82 (J/K) V = 1.44 (cc) Cp = 4.34 (J/K)

rhm-oxide mass = 0.86 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.18Al0.10Ti0.86O3
G = -8553.20 (J) H = -6619.52 (J) S = 1.65 (J/K) V = 0.19 (cc) Cp = 0.82 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.78 | 9.15 | 72.12 | 2.99 | 4.96 |

Total solids mass = 60.87 (gm) density = 2.93 (gm/cc)
G = -920712.12 (J) H = -766659.85 (J) S = 131.32 (J/K) V = 20.75 (cc) Cp = 71.41 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.70 (gm/cc)
G = -1551332.70 (J) H = -1281987.99 (J) S = 229.59 (J/K) V = 36.97 (cc) Cp = 123.43 (J/K)

Oxygen delta moles = -0.00256033 delta grams = -0.0819274
G = 674.73 (J) H = -73.72 (J) S = -0.64 (J/K) V = -249.73 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 37.07 (gm) density = 2.40 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -598313.85 (J) H = -489918.42 (J) S = 93.19 (J/K) V = 15.43 (cc) Cp = 49.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.75 | 0.75 | 13.10 | 0.32 | 0.00 | 1.10 | 0.21 | 0.22 | 0.00 | 0.00 | 2.47 | 2.42 | 5.47 | 0.46 | 2.72 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.82 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.92Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -247780.04 (J) H = -202735.41 (J) S = 38.73 (J/K) V = 5.31 (cc) Cp = 21.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.90 | 95.35 | 97.28 | 3.91 | -3.68 | 5.75 | 0.29 |

clinopyroxene mass = 6.59 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.80Fe"0.42Mg0.56Fe'"0.06Ti0.04Al0.21Si1.86O6
G = -95136.01 (J) H = -79455.72 (J) S = 13.48 (J/K) V = 1.94 (cc) Cp = 7.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.64 | 14.16 | 41.95 | 8.01 | -0.53 | 6.84 | 5.92 |

feldspar mass = 32.13 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.65Ca0.26Al1.26Si2.74O8
G = -526535.25 (J) H = -443080.50 (J) S = 71.75 (J/K) V = 12.31 (cc) Cp = 38.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.26 | 26.44 | 8.31 |

quartz mass = 4.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -72135.11 (J) H = -61369.50 (J) S = 9.26 (J/K) V = 1.72 (cc) Cp = 5.16 (J/K)

rhm-oxide mass = 0.92 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.18Al0.10Ti0.86O3
G = -9124.77 (J) H = -7084.28 (J) S = 1.75 (J/K) V = 0.20 (cc) Cp = 0.87 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.66 | 9.00 | 72.35 | 3.10 | 4.89 |

Total solids mass = 62.85 (gm) density = 2.93 (gm/cc)
G = -950711.18 (J) H = -793725.40 (J) S = 134.97 (J/K) V = 21.48 (cc) Cp = 73.67 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.71 (gm/cc)
G = -1549025.03 (J) H = -1283643.82 (J) S = 228.16 (J/K) V = 36.91 (cc) Cp = 123.07 (J/K)

Oxygen delta moles = -0.00259594 delta grams = -0.0830669
G = 677.65 (J) H = -73.82 (J) S = -0.65 (J/K) V = -251.05 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 880.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.07 COH = 1.54 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 35.22 (gm) density = 2.40 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -568165.00 (J) H = -466162.35 (J) S = 88.46 (J/K) V = 14.68 (cc) Cp = 46.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.61 | 0.71 | 13.20 | 0.29 | 0.00 | 1.02 | 0.21 | 0.21 | 0.00 | 0.00 | 2.42 | 2.35 | 5.64 | 0.49 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.79 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.92Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -246839.06 (J) H = -202465.79 (J) S = 38.48 (J/K) V = 5.30 (cc) Cp = 21.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.55 | 95.52 | 97.77 | 3.96 | -3.74 | 5.75 | 0.29 |

clinopyroxene mass = 6.83 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.80Fe"0.42Mg0.56Fe'"0.06Ti0.04Al0.21Si1.86O6
G = -98690.70 (J) H = -82638.39 (J) S = 13.92 (J/K) V = 2.01 (cc) Cp = 7.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.54 | 13.61 | 41.50 | 8.16 | -0.54 | 6.72 | 6.01 |

feldspar mass = 33.05 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.26Al1.26Si2.74O8
G = -540723.81 (J) H = -455999.30 (J) S = 73.47 (J/K) V = 12.67 (cc) Cp = 40.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.23 | 25.95 | 8.83 |

quartz mass = 5.03 (gm) density = 2.55 (gm/cc)
SiO2
G = -82697.12 (J) H = -70504.53 (J) S = 10.57 (J/K) V = 1.97 (cc) Cp = 5.91 (J/K)

rhm-oxide mass = 0.98 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.11Fe'"0.18Al0.10Ti0.86O3
G = -9616.07 (J) H = -7489.41 (J) S = 1.84 (J/K) V = 0.21 (cc) Cp = 0.92 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.54 | 8.85 | 72.58 | 3.20 | 4.84 |

Total solids mass = 64.69 (gm) density = 2.92 (gm/cc)
G = -978566.75 (J) H = -819097.42 (J) S = 138.29 (J/K) V = 22.16 (cc) Cp = 75.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.71 (gm/cc)
G = -1546731.75 (J) H = -1285259.78 (J) S = 226.75 (J/K) V = 36.84 (cc) Cp = 122.73 (J/K)

Oxygen delta moles = -0.0026313 delta grams = -0.0841986
G = 680.34 (J) H = -73.90 (J) S = -0.65 (J/K) V = -252.28 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 33.49 (gm) density = 2.40 (gm/cc) viscosity = 6.35 (log 10 poise) (analysis in wt %)
G = -539882.01 (J) H = -443830.94 (J) S = 84.02 (J/K) V = 13.98 (cc) Cp = 44.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.45 | 0.66 | 13.30 | 0.27 | 0.00 | 0.94 | 0.22 | 0.20 | 0.00 | 0.00 | 2.36 | 2.27 | 5.79 | 0.51 | 3.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.77 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.91Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -245933.83 (J) H = -202224.24 (J) S = 38.24 (J/K) V = 5.29 (cc) Cp = 21.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.18 | 95.69 | 98.24 | 4.02 | -3.81 | 5.76 | 0.28 |

clinopyroxene mass = 7.06 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.81Fe"0.41Mg0.55Fe'"0.06Ti0.04Al0.21Si1.86O6
G = -101965.31 (J) H = -85601.20 (J) S = 14.31 (J/K) V = 2.08 (cc) Cp = 7.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.42 | 13.07 | 41.04 | 8.32 | -0.55 | 6.61 | 6.09 |

feldspar mass = 33.93 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.25Al1.25Si2.75O8
G = -554072.83 (J) H = -468260.69 (J) S = 75.07 (J/K) V = 13.00 (cc) Cp = 41.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.16 | 25.47 | 9.37 |

quartz mass = 5.64 (gm) density = 2.55 (gm/cc)
SiO2
G = -92560.96 (J) H = -79081.10 (J) S = 11.79 (J/K) V = 2.21 (cc) Cp = 6.62 (J/K)

rhm-oxide mass = 1.02 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.17Al0.10Ti0.87O3
G = -10037.74 (J) H = -7842.64 (J) S = 1.92 (J/K) V = 0.22 (cc) Cp = 0.96 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.42 | 8.69 | 72.80 | 3.30 | 4.79 |

Total solids mass = 66.42 (gm) density = 2.91 (gm/cc)
G = -1004570.67 (J) H = -843009.88 (J) S = 141.33 (J/K) V = 22.80 (cc) Cp = 77.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1544452.68 (J) H = -1286840.82 (J) S = 225.35 (J/K) V = 36.78 (cc) Cp = 122.41 (J/K)

Oxygen delta moles = -0.00266638 delta grams = -0.0853208
G = 682.78 (J) H = -73.94 (J) S = -0.66 (J/K) V = -253.43 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 860.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.06 COH = 1.48 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 31.86 (gm) density = 2.39 (gm/cc) viscosity = 6.34 (log 10 poise) (analysis in wt %)
G = -513210.18 (J) H = -422723.81 (J) S = 79.85 (J/K) V = 13.32 (cc) Cp = 42.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.28 | 0.62 | 13.41 | 0.26 | 0.00 | 0.86 | 0.23 | 0.19 | 0.00 | 0.00 | 2.32 | 2.20 | 5.93 | 0.54 | 3.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.75 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.91Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -245066.50 (J) H = -202012.40 (J) S = 38.00 (J/K) V = 5.28 (cc) Cp = 21.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.80 | 95.86 | 98.68 | 4.09 | -3.89 | 5.78 | 0.28 |

clinopyroxene mass = 7.27 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.81Fe"0.41Mg0.55Fe'"0.06Ti0.04Al0.21Si1.86O6
G = -104993.44 (J) H = -88370.53 (J) S = 14.67 (J/K) V = 2.14 (cc) Cp = 8.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.28 | 12.55 | 40.57 | 8.51 | -0.57 | 6.50 | 6.16 |

feldspar mass = 34.76 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.65Ca0.25Al1.25Si2.75O8
G = -566700.21 (J) H = -479959.88 (J) S = 76.55 (J/K) V = 13.32 (cc) Cp = 42.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.05 | 25.01 | 9.94 |

quartz mass = 6.21 (gm) density = 2.55 (gm/cc)
SiO2
G = -101818.92 (J) H = -87174.38 (J) S = 12.92 (J/K) V = 2.43 (cc) Cp = 7.28 (J/K)

rhm-oxide mass = 1.06 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.17Al0.09Ti0.87O3
G = -10398.41 (J) H = -8150.22 (J) S = 1.98 (J/K) V = 0.23 (cc) Cp = 0.99 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.30 | 8.53 | 73.03 | 3.40 | 4.74 |

Total solids mass = 68.05 (gm) density = 2.91 (gm/cc)
G = -1028977.48 (J) H = -865667.40 (J) S = 144.12 (J/K) V = 23.41 (cc) Cp = 79.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1542187.66 (J) H = -1288391.21 (J) S = 223.97 (J/K) V = 36.73 (cc) Cp = 122.10 (J/K)

Oxygen delta moles = -0.00270112 delta grams = -0.0864325
G = 684.98 (J) H = -73.94 (J) S = -0.67 (J/K) V = -254.48 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 850.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.05 COH = 1.46 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 30.31 (gm) density = 2.39 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -487865.15 (J) H = -402613.47 (J) S = 75.90 (J/K) V = 12.69 (cc) Cp = 40.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.09 | 0.58 | 13.52 | 0.24 | 0.00 | 0.80 | 0.24 | 0.18 | 0.00 | 0.00 | 2.27 | 2.13 | 6.07 | 0.56 | 3.32 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.73 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.91Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -244243.55 (J) H = -201835.60 (J) S = 37.76 (J/K) V = 5.27 (cc) Cp = 21.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.41 | 96.03 | 99.11 | 4.16 | -3.97 | 5.81 | 0.27 |

clinopyroxene mass = 7.47 (gm) density = 3.40 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.82Fe"0.40Mg0.55Fe'"0.06Ti0.04Al0.21Si1.85O6
G = -107796.63 (J) H = -90962.89 (J) S = 14.99 (J/K) V = 2.20 (cc) Cp = 8.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.12 | 12.04 | 40.09 | 8.71 | -0.59 | 6.39 | 6.24 |

feldspar mass = 35.56 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.65Ca0.25Al1.25Si2.75O8
G = -578722.69 (J) H = -491191.85 (J) S = 77.93 (J/K) V = 13.63 (cc) Cp = 42.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.90 | 24.56 | 10.54 |

quartz mass = 6.76 (gm) density = 2.55 (gm/cc)
SiO2
G = -110563.50 (J) H = -94860.40 (J) S = 13.98 (J/K) V = 2.64 (cc) Cp = 7.91 (J/K)

rhm-oxide mass = 1.09 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.17Al0.09Ti0.87O3
G = -10705.87 (J) H = -8417.81 (J) S = 2.04 (J/K) V = 0.24 (cc) Cp = 1.02 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.18 | 8.37 | 73.26 | 3.49 | 4.70 |

apatite mass = 0.00 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -39.16 (J) H = -32.90 (J) S = 0.01 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Total solids mass = 69.61 (gm) density = 2.90 (gm/cc)
G = -1052071.40 (J) H = -887301.45 (J) S = 146.70 (J/K) V = 23.98 (cc) Cp = 81.33 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1539936.55 (J) H = -1289914.92 (J) S = 222.61 (J/K) V = 36.67 (cc) Cp = 121.81 (J/K)

Oxygen delta moles = -0.00273555 delta grams = -0.0875345
G = 686.93 (J) H = -73.92 (J) S = -0.68 (J/K) V = -255.45 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 28.20 (gm) density = 2.38 (gm/cc) viscosity = 6.25 (log 10 poise) (analysis in wt %)
G = -453923.39 (J) H = -375153.23 (J) S = 70.76 (J/K) V = 11.83 (cc) Cp = 37.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.92 | 0.54 | 13.59 | 0.23 | 0.00 | 0.75 | 0.25 | 0.17 | 0.00 | 0.00 | 2.24 | 2.13 | 6.04 | 0.57 | 3.57 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.73 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.91Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -243647.13 (J) H = -201849.36 (J) S = 37.55 (J/K) V = 5.26 (cc) Cp = 21.16 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.97 96.20 99.45 4.27 -4.08 5.86 0.26

clinopyroxene mass = 7.62 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.82Fe"0.40Mg0.55Fe'"0.06Ti0.04Al0.22Si1.85O6
G = -109929.95 (J) H = -93002.06 (J) S = 15.21 (J/K) V = 2.24 (cc) Cp = 8.43 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
27.95 11.53 39.54 8.99 -0.64 6.30 6.32

feldspar mass = 35.41 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.65Ca0.25Al1.25Si2.75O8
G = -575740.85 (J) H = -489764.54 (J) S = 77.24 (J/K) V = 13.57 (cc) Cp = 42.75 (J/K)
albite anorthite sanidine
64.99 24.76 10.25

feldspar mass = 1.38 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.03Al1.03Si2.97O8
G = -21817.11 (J) H = -18509.53 (J) S = 2.97 (J/K) V = 0.55 (cc) Cp = 1.64 (J/K)
albite anorthite sanidine
31.64 2.75 65.61

quartz mass = 7.42 (gm) density = 2.55 (gm/cc)
SiO2
G = -121217.25 (J) H = -104219.18 (J) S = 15.27 (J/K) V = 2.90 (cc) Cp = 8.68 (J/K)

rhm-oxide mass = 1.13 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.16Al0.09Ti0.87O3
G = -11088.72 (J) H = -8746.76 (J) S = 2.10 (J/K) V = 0.24 (cc) Cp = 1.06 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.07 8.20 73.49 3.57 4.68

apatite mass = 0.02 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -336.02 (J) H = -282.96 (J) S = 0.05 (J/K) V = 0.01 (cc) Cp = 0.03 (J/K)

Total solids mass = 71.71 (gm) density = 2.89 (gm/cc)
G = -1083777.04 (J) H = -916374.40 (J) S = 150.39 (J/K) V = 24.78 (cc) Cp = 83.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.73 (gm/cc)
G = -1537700.42 (J) H = -1291527.63 (J) S = 221.15 (J/K) V = 36.61 (cc) Cp = 121.44 (J/K)

Oxygen delta moles = -0.00276825 delta grams = -0.0885807
G = 688.29 (J) H = -73.83 (J) S = -0.68 (J/K) V = -256.20 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 26.12 (gm) density = 2.38 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -420454.01 (J) H = -347945.02 (J) S = 65.73 (J/K) V = 10.99 (cc) Cp = 34.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.71 | 0.49 | 13.65 | 0.22 | 0.00 | 0.71 | 0.27 | 0.16 | 0.00 | 0.00 | 2.22 | 2.15 | 5.97 | 0.59 | 3.85 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.73 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -243210.26 (J) H = -201995.19 (J) S = 37.36 (J/K) V = 5.26 (cc) Cp = 21.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.51 | 96.37 | 99.78 | 4.38 | -4.20 | 5.93 | 0.26 |

clinopyroxene mass = 7.74 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.39Mg0.55Fe'"0.06Ti0.04Al0.22Si1.85O6
G = -111650.06 (J) H = -94699.66 (J) S = 15.37 (J/K) V = 2.28 (cc) Cp = 8.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.75 | 11.04 | 38.98 | 9.30 | -0.68 | 6.21 | 6.41 |

feldspar mass = 35.11 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.65Ca0.25Al1.25Si2.75O8
G = -570205.65 (J) H = -486160.84 (J) S = 76.19 (J/K) V = 13.44 (cc) Cp = 42.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.15 | 25.10 | 9.76 |

feldspar mass = 2.94 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.03Al1.03Si2.97O8
G = -46289.28 (J) H = -39360.57 (J) S = 6.28 (J/K) V = 1.16 (cc) Cp = 3.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.80 | 2.57 | 66.63 |

quartz mass = 8.06 (gm) density = 2.55 (gm/cc)
SiO2
G = -131643.27 (J) H = -113419.87 (J) S = 16.52 (J/K) V = 3.16 (cc) Cp = 9.42 (J/K)

rhm-oxide mass = 1.17 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.16Al0.09Ti0.87O3
G = -11422.76 (J) H = -9039.07 (J) S = 2.16 (J/K) V = 0.25 (cc) Cp = 1.09 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.96 | 8.03 | 73.72 | 3.64 | 4.66 |

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -603.50 (J) H = -509.39 (J) S = 0.09 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

Total solids mass = 73.79 (gm) density = 2.89 (gm/cc)
G = -1115024.77 (J) H = -945184.60 (J) S = 153.96 (J/K) V = 25.57 (cc) Cp = 86.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.73 (gm/cc)
G = -1535478.78 (J) H = -1293129.62 (J) S = 219.69 (J/K) V = 36.55 (cc) Cp = 121.09 (J/K)

Oxygen delta moles = -0.00280139 delta grams = -0.0896411

G = 689.61 (J)  H = -73.72 (J)  S = -0.69 (J/K)  V = -256.94 (cc)  Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 820.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = 0.02  COH = 1.37  IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 24.20 (gm)  density = 2.37 (gm/cc)  viscosity = 6.05 (log 10 poise)  (analysis in wt %)
G = -389614.45 (J)  H = -322818.71 (J)  S = 61.10 (J/K)  V = 10.21 (cc)  Cp = 32.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.48 | 0.44 | 13.71 | 0.21 | 0.00 | 0.68 | 0.29 | 0.16 | 0.00 | 0.00 | 2.20 | 2.18 | 5.88 | 0.61 | 4.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.74 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -242880.59 (J)  H = -202229.20 (J)  S = 37.19 (J/K)  V = 5.26 (cc)  Cp = 21.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.05 | 96.53 | 100.10 | 4.49 | -4.32 | 5.99 | 0.25 |

clinopyroxene  mass = 7.84 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.38Mg0.55Fe'"0.05Ti0.04Al0.22Si1.85O6
G = -113105.73 (J)  H = -96179.03 (J)  S = 15.48 (J/K)  V = 2.31 (cc)  Cp = 8.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.52 | 10.55 | 38.41 | 9.61 | -0.72 | 6.12 | 6.50 |

feldspar  mass = 34.87 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.65Ca0.25Al1.25Si2.75O8
G = -565706.89 (J)  H = -483418.57 (J)  S = 75.28 (J/K)  V = 13.34 (cc)  Cp = 42.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.30 | 25.41 | 9.29 |

feldspar  mass = 4.33 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.68Na0.30Ca0.02Al1.02Si2.98O8
G = -68111.58 (J)  H = -58047.40 (J)  S = 9.21 (J/K)  V = 1.71 (cc)  Cp = 5.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.97 | 2.41 | 67.62 |

quartz  mass = 8.67 (gm)  density = 2.55 (gm/cc)
SiO2
G = -141350.29 (J)  H = -122037.03 (J)  S = 17.67 (J/K)  V = 3.39 (cc)  Cp = 10.12 (J/K)

rhm-oxide  mass = 1.20 (gm)  density = 4.64 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.16Al0.09Ti0.88O3
G = -11685.03 (J)  H = -9276.05 (J)  S = 2.20 (J/K)  V = 0.26 (cc)  Cp = 1.11 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.85 | 7.85 | 73.96 | 3.70 | 4.64 |

apatite  mass = 0.06 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -816.75 (J)  H = -690.99 (J)  S = 0.12 (J/K)  V = 0.02 (cc)  Cp = 0.06 (J/K)

Total solids mass = 75.71 (gm) density = 2.88 (gm/cc)
G = -1143656.86 (J) H = -971878.28 (J) S = 157.14 (J/K) V = 26.29 (cc) Cp = 88.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.74 (gm/cc)
G = -1533271.31 (J) H = -1294696.99 (J) S = 218.24 (J/K) V = 36.50 (cc) Cp = 120.77 (J/K)

Oxygen delta moles = -0.00283525 delta grams = -0.0907247
G = 690.94 (J) H = -73.61 (J) S = -0.70 (J/K) V = -257.69 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 22.42 (gm) density = 2.36 (gm/cc) viscosity = 5.93 (log 10 poise) (analysis in wt %)
G = -360996.70 (J) H = -299445.76 (J) S = 56.83 (J/K) V = 9.48 (cc) Cp = 30.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.19 | 0.40 | 13.77 | 0.20 | 0.00 | 0.65 | 0.31 | 0.15 | 0.00 | 0.00 | 2.20 | 2.21 | 5.79 | 0.64 | 4.49 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.77 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.90Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -242644.19 (J) H = -202540.41 (J) S = 37.03 (J/K) V = 5.26 (cc) Cp = 21.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.58 | 96.70 | 100.41 | 4.60 | -4.44 | 6.06 | 0.25 |

clinopyroxene mass = 7.92 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.38Mg0.55Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -114338.25 (J) H = -97473.62 (J) S = 15.57 (J/K) V = 2.33 (cc) Cp = 8.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.27 | 10.08 | 37.84 | 9.95 | -0.76 | 6.02 | 6.59 |

feldspar mass = 34.68 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.65Ca0.26Al1.26Si2.74O8
G = -562042.66 (J) H = -481371.13 (J) S = 74.48 (J/K) V = 13.27 (cc) Cp = 41.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.45 | 25.70 | 8.85 |

feldspar mass = 5.59 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -87724.63 (J) H = -74931.07 (J) S = 11.81 (J/K) V = 2.20 (cc) Cp = 6.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.16 | 2.26 | 68.58 |

quartz mass = 9.24 (gm) density = 2.55 (gm/cc)
SiO2
G = -150464.92 (J) H = -130176.26 (J) S = 18.73 (J/K) V = 3.62 (cc) Cp = 10.78 (J/K)

rhm-oxide mass = 1.22 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.15Al0.09Ti0.88O3
G = -11884.99 (J) H = -9464.70 (J) S = 2.23 (J/K) V = 0.26 (cc) Cp = 1.13 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.74 | 7.68 | 74.21 | 3.75 | 4.62 |

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -981.61 (J) H = -832.39 (J) S = 0.14 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 77.49 (gm) density = 2.87 (gm/cc)
G = -1170081.25 (J) H = -996789.57 (J) S = 159.99 (J/K) V = 26.97 (cc) Cp = 90.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.74 (gm/cc)
G = -1531077.95 (J) H = -1296235.33 (J) S = 216.81 (J/K) V = 36.45 (cc) Cp = 120.48 (J/K)

Oxygen delta moles = -0.00286963 delta grams = -0.0918248
G = 692.25 (J) H = -73.50 (J) S = -0.71 (J/K) V = -258.43 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 20.58 (gm) density = 2.36 (gm/cc) viscosity = 5.74 (log 10 poise) (analysis in wt %)
G = -331516.68 (J) H = -275171.28 (J) S = 52.50 (J/K) V = 8.74 (cc) Cp = 27.78 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.92 | 0.35 | 13.64 | 0.20 | 0.00 | 0.63 | 0.37 | 0.15 | 0.00 | 0.00 | 2.20 | 2.36 | 5.62 | 0.67 | 4.89 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.09 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -1260.93 (J) H = -1068.95 (J) S = 0.18 (J/K) V = 0.02 (cc) Cp = 0.10 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.97 | 18.15 | 21.88 |

orthopyroxene mass = 19.36 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.89Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -249610.11 (J) H = -208845.02 (J) S = 37.99 (J/K) V = 5.42 (cc) Cp = 21.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.41 | 96.85 | 101.14 | 4.61 | -4.45 | 6.02 | 0.24 |

clinopyroxene mass = 6.19 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.38Mg0.55Fe'"0.05Ti0.05Al0.22Si1.85O6
G = -89241.26 (J) H = -76258.83 (J) S = 12.10 (J/K) V = 1.82 (cc) Cp = 6.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.82 | 9.75 | 37.67 | 9.82 | -0.68 | 5.84 | 6.77 |

clinopyroxene mass = 2.11 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.29Mg0.30Fe'"0.05Ti0.39Al0.74Si1.25O6
G = -30400.35 (J) H = -26098.94 (J) S = 4.01 (J/K) V = 0.59 (cc) Cp = 2.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.46 | 1.89 | 29.27 | 69.93 | 7.64 | -2.19 | 5.92 |

feldspar mass = 33.79 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -546934.27 (J) H = -469437.67 (J) S = 72.21 (J/K) V = 12.93 (cc) Cp = 40.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.21 | 25.13 | 8.66 |

feldspar mass = 6.97 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -109123.04 (J) H = -93416.56 (J) S = 14.64 (J/K) V = 2.74 (cc) Cp = 8.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.91 | 2.10 | 68.99 |

quartz mass = 9.99 (gm) density = 2.55 (gm/cc)
SiO2
G = -162532.28 (J) H = -140907.74 (J) S = 20.15 (J/K) V = 3.91 (cc) Cp = 11.64 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.15Al0.09Ti0.88O3
G = -7108.65 (J) H = -5677.55 (J) S = 1.33 (J/K) V = 0.16 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.57 | 7.60 | 74.18 | 4.13 | 4.52 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1123.16 (J) H = -954.62 (J) S = 0.16 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 79.32 (gm) density = 2.87 (gm/cc)
G = -1197334.06 (J) H = -1022665.87 (J) S = 162.76 (J/K) V = 27.63 (cc) Cp = 92.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.75 (gm/cc)
G = -1528850.74 (J) H = -1297837.15 (J) S = 215.27 (J/K) V = 36.36 (cc) Cp = 120.18 (J/K)

Oxygen delta moles = -0.00299673 delta grams = -0.0958918
G = 715.53 (J) H = -75.70 (J) S = -0.74 (J/K) V = -267.38 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27
IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 18.77 (gm) density = 2.35 (gm/cc) viscosity = 5.50 (log 10 poise) (analysis in wt %)
G = -302333.75 (J) H = -251016.31 (J) S = 48.27 (J/K) V = 8.00 (cc) Cp = 25.41 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.62 0.31 13.38 0.20 0.00 0.61 0.44 0.14 0.00 0.00 2.22 2.60 5.39 0.72 5.36 0.00 0.00 0.00 0.00

garnet mass = 1.17 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -15627.81 (J) H = -13278.67 (J) S = 2.21 (J/K) V = 0.30 (cc) Cp = 1.25 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.16 | 18.10 | 21.74 |

orthopyroxene mass = 19.13 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.90Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -246365.01 (J) H = -206687.67 (J) S = 37.32 (J/K) V = 5.36 (cc) Cp = 21.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.04 | 96.95 | 100.89 | 4.48 | -4.33 | 5.81 | 0.25 |

clinopyroxene mass = 4.91 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.37Mg0.56Fe'"0.05Ti0.04Al0.22Si1.86O6
G = -70858.08 (J) H = -60705.92 (J) S = 9.55 (J/K) V = 1.45 (cc) Cp = 5.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.20 | 9.41 | 36.95 | 9.50 | -0.54 | 5.49 | 6.99 |

clinopyroxene mass = 3.78 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.29Mg0.30Fe'"0.05Ti0.39Al0.74Si1.24O6
G = -54563.25 (J) H = -46954.53 (J) S = 7.16 (J/K) V = 1.06 (cc) Cp = 4.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.49 | 1.79 | 28.99 | 70.36 | 7.79 | -2.59 | 6.14 |

feldspar mass = 32.50 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.67Ca0.24Al1.24Si2.76O8
G = -525267.02 (J) H = -451778.39 (J) S = 69.12 (J/K) V = 12.44 (cc) Cp = 39.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.38 | 24.01 | 8.61 |

feldspar mass = 8.37 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -130847.29 (J) H = -112261.51 (J) S = 17.48 (J/K) V = 3.30 (cc) Cp = 9.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.01 | 1.95 | 69.04 |

quartz mass = 10.85 (gm) density = 2.55 (gm/cc)
SiO2
G = -176270.70 (J) H = -153133.80 (J) S = 21.76 (J/K) V = 4.25 (cc) Cp = 12.63 (J/K)

rhm-oxide mass = 0.34 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.10Fe'"0.15Al0.09Ti0.88O3
G = -3268.68 (J) H = -2618.68 (J) S = 0.61 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.57 | 7.45 | 74.08 | 4.52 | 4.38 |

apatite mass = 0.08 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1233.10 (J) H = -1050.47 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 81.13 (gm) density = 2.87 (gm/cc)
G = -1224300.94 (J) H = -1048469.64 (J) S = 165.39 (J/K) V = 28.24 (cc) Cp = 94.44 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.76 (gm/cc)
G = -1526634.69 (J) H = -1299485.95 (J) S = 213.66 (J/K) V = 36.24 (cc) Cp = 119.85 (J/K)

Oxygen delta moles = -0.00313321 delta grams = -0.100259
G = 740.41 (J) H = -78.04 (J) S = -0.77 (J/K) V = -276.95 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 780.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.02 COH = 1.24 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 17.06 (gm) density = 2.34 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -274896.12 (J) H = -228240.15 (J) S = 44.30 (J/K) V = 7.30 (cc) Cp = 23.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.20 | 0.27 | 13.12 | 0.20 | 0.00 | 0.60 | 0.53 | 0.14 | 0.00 | 0.00 | 2.25 | 2.87 | 5.14 | 0.78 | 5.89 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.17 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -28985.31 (J) H = -24684.54 (J) S = 4.08 (J/K) V = 0.55 (cc) Cp = 2.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.34 | 18.05 | 21.62 |

orthopyroxene mass = 18.85 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.01Mg0.91Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -242685.57 (J) H = -204153.37 (J) S = 36.59 (J/K) V = 5.28 (cc) Cp = 21.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.61 | 97.05 | 100.58 | 4.35 | -4.22 | 5.60 | 0.25 |

clinopyroxene mass = 3.87 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.36Mg0.56Fe'"0.05Ti0.04Al0.22Si1.86O6
G = -55899.78 (J) H = -48014.02 (J) S = 7.49 (J/K) V = 1.14 (cc) Cp = 4.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.60 | 9.08 | 36.20 | 9.19 | -0.41 | 5.15 | 7.19 |

clinopyroxene mass = 5.19 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.29Mg0.30Fe'"0.05Ti0.39Al0.74Si1.24O6
G = -74738.80 (J) H = -64469.38 (J) S = 9.75 (J/K) V = 1.45 (cc) Cp = 5.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.50 | 1.70 | 28.69 | 70.80 | 7.93 | -2.98 | 6.36 |

feldspar mass = 31.34 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.23Al1.23Si2.77O8
G = -505824.38 (J) H = -435964.13 (J) S = 66.33 (J/K) V = 12.00 (cc) Cp = 37.97 (J/K)

albite anorthite sanidine
68.51 22.96 8.54

feldspar mass = 9.66 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -150846.31 (J) H = -129705.48 (J) S = 20.07 (J/K) V = 3.80 (cc) Cp = 11.39 (J/K)
albite anorthite sanidine
29.04 1.81 69.16

quartz mass = 11.67 (gm) density = 2.55 (gm/cc)
SiO2
G = -189275.13 (J) H = -164769.67 (J) S = 23.27 (J/K) V = 4.57 (cc) Cp = 13.56 (J/K)

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1291.34 (J) H = -1102.61 (J) S = 0.18 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 82.83 (gm) density = 2.87 (gm/cc)
G = -1249546.62 (J) H = -1072863.18 (J) S = 167.77 (J/K) V = 28.82 (cc) Cp = 96.37 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.77 (gm/cc)
G = -1524442.74 (J) H = -1301103.33 (J) S = 212.07 (J/K) V = 36.12 (cc) Cp = 119.56 (J/K)

Oxygen delta moles = -0.00325436 delta grams = -0.104135
G = 761.05 (J) H = -79.92 (J) S = -0.80 (J/K) V = -284.96 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 15.46 (gm) density = 2.32 (gm/cc) viscosity = 4.94 (log 10 poise) (analysis in wt %)
G = -249194.75 (J) H = -206865.52 (J) S = 40.58 (J/K) V = 6.65 (cc) Cp = 21.12 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.67 0.23 12.91 0.20 0.00 0.57 0.59 0.14 0.00 0.00 2.30 3.15 4.89 0.86 6.51 0.00 0.00 0.00 0.00

garnet mass = 3.58 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -47672.60 (J) H = -40694.73 (J) S = 6.69 (J/K) V = 0.91 (cc) Cp = 3.82 (J/K)
almandine grossular pyrope
60.30 17.98 21.72

orthopyroxene mass = 17.87 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.92Fe"'0.01Ti0.00Al0.10Si1.95O6
G = -230313.28 (J) H = -194320.11 (J) S = 34.50 (J/K) V = 5.01 (cc) Cp = 20.09 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.38 97.14 99.51 4.23 -4.10 5.36 0.25

clinopyroxene mass = 4.03 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.84Fe"0.35Mg0.57Fe'"0.04Ti0.04Al0.21Si1.87O6
G = -58331.31 (J) H = -50239.73 (J) S = 7.76 (J/K) V = 1.19 (cc) Cp = 4.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.56 | 8.74 | 34.98 | 8.91 | -0.37 | 4.82 | 7.36 |

clinopyroxene mass = 5.21 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.28Mg0.31Fe'"0.05Ti0.40Al0.75Si1.24O6
G = -75128.59 (J) H = -64966.14 (J) S = 9.74 (J/K) V = 1.46 (cc) Cp = 5.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.32 | 1.60 | 28.11 | 71.41 | 8.00 | -3.35 | 6.54 |

feldspar mass = 30.44 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.22Al1.22Si2.78O8
G = -490697.11 (J) H = -423819.17 (J) S = 64.11 (J/K) V = 11.66 (cc) Cp = 36.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.47 | 22.12 | 8.41 |

feldspar mass = 10.80 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.02Al1.02Si2.98O8
G = -168490.99 (J) H = -145197.24 (J) S = 22.33 (J/K) V = 4.26 (cc) Cp = 12.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.90 | 1.67 | 69.43 |

quartz mass = 12.41 (gm) density = 2.55 (gm/cc)
SiO2
G = -201160.06 (J) H = -175474.98 (J) S = 24.62 (J/K) V = 4.86 (cc) Cp = 14.41 (J/K)

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1306.02 (J) H = -1117.70 (J) S = 0.18 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 84.44 (gm) density = 2.88 (gm/cc)
G = -1273099.96 (J) H = -1095829.79 (J) S = 169.94 (J/K) V = 29.37 (cc) Cp = 98.20 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.77 (gm/cc)
G = -1522294.72 (J) H = -1302695.31 (J) S = 210.52 (J/K) V = 36.02 (cc) Cp = 119.31 (J/K)

Oxygen delta moles = -0.00332156 delta grams = -0.106286
G = 768.62 (J) H = -80.41 (J) S = -0.81 (J/K) V = -288.08 (cc) Cp = -0.12 (J/K)

**********_____**********
Title: intermediate

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17
IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 13.56 (gm) density = 2.31 (gm/cc) viscosity = 4.58 (log 10 poise) (analysis in wt %)
G = -218755.27 (J) H = -181443.70 (J) S = 36.11 (J/K) V = 5.87 (cc) Cp = 18.64 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.94 0.19 12.58 0.20 0.00 0.57 0.67 0.13 0.00 0.00 2.38 3.52 4.58 0.97 7.26 0.00 0.00 0.00 0.00

garnet mass = 5.20 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.61Mg0.21)3Al2Si3O12
G = -69120.35 (J) H = -59134.02 (J) S = 9.67 (J/K) V = 1.31 (cc) Cp = 5.55 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.62 | 17.93 | 21.45 |

orthopyroxene mass = 16.35 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"1.00Mg0.92Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -210365.40 (J) H = -177937.70 (J) S = 31.39 (J/K) V = 4.58 (cc) Cp = 18.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.46 | 97.25 | 99.66 | 4.11 | -3.99 | 5.18 | 0.25 |

clinopyroxene mass = 4.20 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.35Mg0.58Fe'"0.04Ti0.04Al0.21Si1.87O6
G = -60801.51 (J) H = -52494.42 (J) S = 8.04 (J/K) V = 1.24 (cc) Cp = 4.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.57 | 8.44 | 34.50 | 8.59 | -0.19 | 4.49 | 7.59 |

clinopyroxene mass = 5.24 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.28Mg0.31Fe'"0.04Ti0.40Al0.75Si1.24O6
G = -75490.87 (J) H = -65427.66 (J) S = 9.74 (J/K) V = 1.46 (cc) Cp = 5.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.45 | 1.52 | 27.99 | 71.69 | 8.20 | -3.74 | 6.79 |

biotite mass = 0.49 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -7701.34 (J) H = -6612.32 (J) S = 1.05 (J/K) V = 0.18 (cc) Cp = 0.61 (J/K)

| annite | phlogopite |
|---|---|
| 5.59 | 94.41 |

feldspar mass = 29.67 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.71Ca0.21Al1.21Si2.79O8
G = -477659.62 (J) H = -413419.28 (J) S = 62.18 (J/K) V = 11.37 (cc) Cp = 36.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.60 | 21.06 | 8.34 |

feldspar mass = 11.58 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.02Al1.02Si2.98O8
G = -180371.83 (J) H = -155777.22 (J) S = 23.81 (J/K) V = 4.56 (cc) Cp = 13.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.90 | 1.53 | 69.57 |

quartz mass = 13.50 (gm) density = 2.55 (gm/cc)
SiO2
G = -218534.52 (J) H = -191020.59 (J) S = 26.63 (J/K) V = 5.29 (cc) Cp = 15.65 (J/K)

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1370.52 (J) H = -1175.56 (J) S = 0.19 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

Total solids mass = 86.33 (gm) density = 2.88 (gm/cc)
G = -1301415.96 (J) H = -1122998.77 (J) S = 172.69 (J/K) V = 30.03 (cc) Cp = 100.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.78 (gm/cc)
G = -1520171.23 (J) H = -1304442.47 (J) S = 208.81 (J/K) V = 35.90 (cc) Cp = 119.05 (J/K)

Oxygen delta moles = -0.00337187 delta grams = -0.107896
G = 772.01 (J) H = -80.44 (J) S = -0.83 (J/K) V = -289.64 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: intermediate

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 10.01 (gm) density = 2.29 (gm/cc) viscosity = 4.11 (log 10 poise) (analysis in wt %)
G = -161689.64 (J) H = -133813.47 (J) S = 27.25 (J/K) V = 4.38 (cc) Cp = 13.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.12 | 0.15 | 11.85 | 0.24 | 0.00 | 0.64 | 0.63 | 0.12 | 0.00 | 0.00 | 2.49 | 4.26 | 4.11 | 1.10 | 8.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.81 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.62Mg0.20)3Al2Si3O12
G = -142472.10 (J) H = -122099.11 (J) S = 19.91 (J/K) V = 2.72 (cc) Cp = 11.47 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.26 | 17.99 | 19.76 |

orthopyroxene mass = 7.92 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.05Mg0.87Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -100616.44 (J) H = -85181.80 (J) S = 15.09 (J/K) V = 2.21 (cc) Cp = 8.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.53 | 97.46 | 104.56 | 4.00 | -3.89 | 5.16 | 0.24 |

clinopyroxene mass = 9.14 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.37Mg0.55Fe'"0.05Ti0.04Al0.20Si1.87O6
G = -131203.93 (J) H = -113421.24 (J) S = 17.38 (J/K) V = 2.69 (cc) Cp = 10.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.95 | 8.37 | 37.06 | 7.85 | 0.42 | 4.23 | 8.11 |

biotite mass = 4.08 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -63713.10 (J) H = -54785.35 (J) S = 8.73 (J/K) V = 1.46 (cc) Cp = 5.10 (J/K)

| annite | phlogopite |
|---|---|
| 7.24 | 92.76 |

feldspar mass = 30.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -482399.69 (J) H = -418354.08 (J) S = 62.60 (J/K) V = 11.51 (cc) Cp = 36.81 (J/K)

albite anorthite sanidine
72.36 19.12 8.53

feldspar mass = 9.93 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -154434.69 (J) H = -133666.33 (J) S = 20.30 (J/K) V = 3.91 (cc) Cp = 11.74 (J/K)
albite anorthite sanidine
29.49 1.38 69.13

quartz mass = 16.49 (gm) density = 2.55 (gm/cc)
SiO2
G = -266614.98 (J) H = -233522.24 (J) S = 32.34 (J/K) V = 6.46 (cc) Cp = 19.10 (J/K)

rhm-oxide mass = 1.36 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.76Mg0.09Fe'"0.14Al0.07Ti0.89O3
G = -12988.46 (J) H = -10523.06 (J) S = 2.41 (J/K) V = 0.29 (cc) Cp = 1.24 (J/K)
geikielite hematite ilmenite pyrophanite corundum
8.63 7.13 76.28 4.29 3.67

apatite mass = 0.14 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2084.46 (J) H = -1792.01 (J) S = 0.29 (J/K) V = 0.05 (cc) Cp = 0.16 (J/K)

Total solids mass = 89.89 (gm) density = 2.87 (gm/cc)
G = -1356527.85 (J) H = -1173345.22 (J) S = 179.04 (J/K) V = 31.30 (cc) Cp = 104.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.80 (gm/cc)
G = -1518217.49 (J) H = -1307158.70 (J) S = 206.28 (J/K) V = 35.68 (cc) Cp = 118.38 (J/K)

Oxygen delta moles = -0.00313906 delta grams = -0.100446
G = 711.03 (J) H = -73.79 (J) S = -0.77 (J/K) V = -267.03 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 7.76 (gm) density = 2.26 (gm/cc) viscosity = 3.49 (log 10 poise) (analysis in wt %)
G = -125420.74 (J) H = -103401.07 (J) S = 21.73 (J/K) V = 3.43 (cc) Cp = 10.90 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.50 0.11 11.08 0.28 0.00 0.72 0.79 0.10 0.00 0.00 2.72 5.10 3.56 1.33 9.72 0.00 0.00 0.00 0.00

garnet mass = 12.77 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.64Mg0.18)3Al2Si3O12
G = -167315.18 (J) H = -143651.08 (J) S = 23.36 (J/K) V = 3.21 (cc) Cp = 13.50 (J/K)
almandine grossular pyrope
63.67 18.04 18.29

orthopyroxene mass = 5.04 (gm) density = 3.61 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.09Mg0.83Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -63261.85 (J) H = -53616.31 (J) S = 9.52 (J/K) V = 1.40 (cc) Cp = 5.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -111.93 | 97.63 | 108.86 | 3.87 | -3.77 | 5.10 | 0.24 |

clinopyroxene mass = 9.40 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.39Mg0.52Fe'"0.05Ti0.04Al0.20Si1.88O6
G = -133930.66 (J) H = -115934.97 (J) S = 17.76 (J/K) V = 2.76 (cc) Cp = 10.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.68 | 8.36 | 39.47 | 6.93 | 0.89 | 4.07 | 8.60 |

biotite mass = 5.92 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.09Mg0.91)3AlSi3O10(OH)2
G = -91680.82 (J) H = -78942.51 (J) S = 12.57 (J/K) V = 2.12 (cc) Cp = 7.37 (J/K)

| annite | phlogopite |
|---|---|
| 9.17 | 90.83 |

feldspar mass = 29.79 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.17Al1.17Si2.83O8
G = -478170.55 (J) H = -415528.89 (J) S = 61.83 (J/K) V = 11.44 (cc) Cp = 36.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.89 | 17.47 | 8.64 |

feldspar mass = 9.38 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -145703.98 (J) H = -126384.08 (J) S = 19.07 (J/K) V = 3.69 (cc) Cp = 11.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.87 | 1.24 | 68.89 |

quartz mass = 18.29 (gm) density = 2.55 (gm/cc)
SiO2
G = -295238.47 (J) H = -259117.70 (J) S = 35.65 (J/K) V = 7.16 (cc) Cp = 21.14 (J/K)

rhm-oxide mass = 1.39 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.77Mg0.08Fe'"0.15Al0.07Ti0.89O3
G = -13141.43 (J) H = -10668.50 (J) S = 2.44 (J/K) V = 0.30 (cc) Cp = 1.26 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.88 | 7.36 | 76.96 | 4.38 | 3.41 |

apatite mass = 0.16 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2310.49 (J) H = -1990.82 (J) S = 0.32 (J/K) V = 0.05 (cc) Cp = 0.18 (J/K)

Total solids mass = 92.14 (gm) density = 2.87 (gm/cc)
G = -1390753.44 (J) H = -1205834.86 (J) S = 182.52 (J/K) V = 32.12 (cc) Cp = 107.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.81 (gm/cc)
G = -1516174.18 (J) H = -1309235.93 (J) S = 204.25 (J/K) V = 35.55 (cc) Cp = 118.18 (J/K)

Oxygen delta moles = -0.0031212 delta grams = -0.0998746

G = 699.36 (J)  H = -72.28 (J)  S = -0.76 (J/K)  V = -262.92 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 730.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.07  COH = 1.06
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 5.73 (gm)  density = 2.23 (gm/cc)  viscosity = 2.65 (log 10 poise)  (analysis in wt %)
G = -92852.72 (J)  H = -76026.52 (J)  S = 16.77 (J/K)  V = 2.58 (cc)  Cp = 8.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.48 | 0.07 | 10.18 | 0.34 | 0.00 | 0.82 | 1.07 | 0.09 | 0.00 | 0.00 | 3.18 | 6.19 | 2.88 | 1.77 | 11.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.33 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.65Mg0.17)3Al2Si3O12
G = -186521.27 (J)  H = -160440.94 (J)  S = 26.00 (J/K)  V = 3.59 (cc)  Cp = 15.09 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.97 | 18.06 | 16.97 |

orthopyroxene  mass = 2.55 (gm)  density = 3.62 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.13Mg0.80Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -31686.71 (J)  H = -26888.02 (J)  S = 4.78 (J/K)  V = 0.71 (cc)  Cp = 2.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -115.97 | 97.77 | 112.86 | 3.72 | -3.64 | 5.01 | 0.24 |

clinopyroxene  mass = 9.66 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.42Mg0.50Fe'"0.05Ti0.04Al0.19Si1.89O6
G = -136559.51 (J)  H = -118375.50 (J)  S = 18.13 (J/K)  V = 2.83 (cc)  Cp = 10.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.42 | 8.34 | 41.79 | 6.08 | 1.38 | 3.90 | 9.08 |

biotite  mass = 7.62 (gm)  density = 2.81 (gm/cc)  (analysis in mole %)
K(Fe"0.12Mg0.88)3AlSi3O10(OH)2
G = -116782.53 (J)  H = -100675.06 (J)  S = 16.06 (J/K)  V = 2.71 (cc)  Cp = 9.43 (J/K)

| annite | phlogopite |
|---|---|
| 11.55 | 88.45 |

feldspar  mass = 29.81 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.09Na0.75Ca0.16Al1.16Si2.84O8
G = -477713.58 (J)  H = -415986.77 (J)  S = 61.53 (J/K)  V = 11.45 (cc)  Cp = 37.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.28 | 16.01 | 8.71 |

feldspar  mass = 8.74 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -135701.80 (J)  H = -117964.53 (J)  S = 17.68 (J/K)  V = 3.44 (cc)  Cp = 10.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.10 | 1.11 | 68.79 |

quartz  mass = 19.89 (gm)  density = 2.55 (gm/cc)

SiO2
G = -320745.24 (J)  H = -282073.04 (J)  S = 38.55 (J/K)  V = 7.79 (cc)  Cp = 22.97 (J/K)

rhm-oxide  mass = 1.41 (gm)  density = 4.69 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.78Mg0.07Fe'"0.15Al0.06Ti0.89O3
G = -13223.34 (J)  H = -10758.35 (J)  S = 2.46 (J/K)  V = 0.30 (cc)  Cp = 1.27 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 7.22 | 7.56 | 77.65 | 4.40 | 3.18 |

apatite  mass = 0.16 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2363.96 (J)  H = -2041.48 (J)  S = 0.32 (J/K)  V = 0.05 (cc)  Cp = 0.18 (J/K)

Total solids  mass = 94.17 (gm)  density = 2.87 (gm/cc)
G = -1421297.94 (J)  H = -1235203.70 (J)  S = 185.51 (J/K)  V = 32.87 (cc)  Cp = 109.94 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.82 (gm/cc)
G = -1514150.66 (J)  H = -1311230.22 (J)  S = 202.28 (J/K)  V = 35.44 (cc)  Cp = 118.17 (J/K)

Oxygen  delta moles = -0.00310358  delta grams = -0.0993109
G = 687.85 (J)  H = -70.79 (J)  S = -0.76 (J/K)  V = -258.85 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.54 (gm/cc)  viscosity = 3.08 (log 10 poise)  (analysis in wt %)
G = -1652178.08 (J)  H = -1207503.60 (J)  S = 282.67 (J/K)  V = 39.32 (cc)  Cp = 144.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.27 | 0.00 | 6.54 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.08 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.54 (gm/cc)
G = -1652178.08 (J)  H = -1207503.60 (J)  S = 282.67 (J/K)  V = 39.32 (cc)  Cp = 144.58 (J/K)

Oxygen  delta moles = 1.00614e-16  delta grams = 3.21953e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.55 (gm/cc)  viscosity = 3.13 (log 10 poise)  (analysis in wt %)
G = -1649358.32 (J)  H = -1208951.30 (J)  S = 281.74 (J/K)  V = 39.29 (cc)  Cp = 144.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.27 | 0.00 | 6.54 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.55 (gm/cc)
G = -1649358.32 (J)  H = -1208951.30 (J)  S = 281.74 (J/K)  V = 39.29 (cc)  Cp = 144.58 (J/K)

Oxygen  delta moles = 4.16956e-06  delta grams = 0.000133421
G = -1.51 (J)  H = 0.18 (J)  S = 0.00 (J/K)  V = 0.54 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.55 (gm/cc)  viscosity = 3.18 (log 10 poise)  (analysis in wt %)
G = -1646548.09 (J)  H = -1210399.17 (J)  S = 280.82 (J/K)  V = 39.26 (cc)  Cp = 144.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.27 | 0.00 | 6.54 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.18 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.55 (gm/cc)
G = -1646548.09 (J)  H = -1210399.17 (J)  S = 280.82 (J/K)  V = 39.26 (cc)  Cp = 144.57 (J/K)

Oxygen  delta moles = 8.86645e-06  delta grams = 0.000283716
G = -3.19 (J)  H = 0.38 (J)  S = 0.00 (J/K)  V = 1.14 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.66 (gm)  density = 2.55 (gm/cc)  viscosity = 3.24 (log 10 poise)  (analysis in wt %)
G = -1638317.50 (J)  H = -1207861.48 (J)  S = 278.95 (J/K)  V = 39.11 (cc)  Cp = 144.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.99 | 0.81 | 13.38 | 1.27 | 0.00 | 6.52 | 0.09 | 3.66 | 0.00 | 0.00 | 4.19 | 3.40 | 2.51 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.34 (gm)  density = 3.26 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.40Mg1.51Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -5423.63 (J)  H = -4123.27 (J)  S = 0.84 (J/K)  V = 0.10 (cc)  Cp = 0.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -41.82 | 96.42 | 40.07 | 2.85 | -2.59 | 4.84 | 0.22 |

Total solids  mass = 0.34 (gm)  density = 3.26 (gm/cc)
G = -5423.63 (J)  H = -4123.27 (J)  S = 0.84 (J/K)  V = 0.10 (cc)  Cp = 0.43 (J/K)

Viscosity of the System: 3.25 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.55 (gm/cc)
G = -1643741.13 (J)  H = -1211984.74 (J)  S = 279.79 (J/K)  V = 39.22 (cc)  Cp = 144.44 (J/K)

Oxygen delta moles = 2.4614e-06 delta grams = 7.87618e-05
G = -0.88 (J) H = 0.10 (J) S = 0.00 (J/K) V = 0.32 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1260.00 (C) P = 7.000 (kbars) log(10) f O2 = -6.90 delta HM = -4.83 NNO = 0.00 QFM = 0.25 COH = 2.22 IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid mass = 98.75 (gm) density = 2.55 (gm/cc) viscosity = 3.32 (log 10 poise) (analysis in wt %)
G = -1621048.19 (J) H = -1198651.92 (J) S = 275.51 (J/K) V = 38.76 (cc) Cp = 142.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.07 | 0.82 | 13.48 | 1.27 | 0.00 | 6.46 | 0.09 | 3.44 | 0.00 | 0.00 | 4.22 | 3.43 | 2.53 | 0.17 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.25 (gm) density = 3.27 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.42Mg1.49Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -19885.32 (J) H = -15144.60 (J) S = 3.09 (J/K) V = 0.38 (cc) Cp = 1.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -43.18 | 96.22 | 41.52 | 2.92 | -2.65 | 4.94 | 0.23 |

Total solids mass = 1.25 (gm) density = 3.27 (gm/cc)
G = -19885.32 (J) H = -15144.60 (J) S = 3.09 (J/K) V = 0.38 (cc) Cp = 1.58 (J/K)

Viscosity of the System: 3.34 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1640933.51 (J) H = -1213796.51 (J) S = 278.60 (J/K) V = 39.15 (cc) Cp = 144.10 (J/K)

Oxygen delta moles = -2.55127e-05 delta grams = -0.000816376
G = 9.06 (J) H = -1.07 (J) S = -0.01 (J/K) V = -3.25 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1250.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.01 delta HM = -4.83 NNO = 0.00 QFM = 0.24 COH = 2.21 IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid mass = 97.86 (gm) density = 2.55 (gm/cc) viscosity = 3.40 (log 10 poise) (analysis in wt %)
G = -1604378.50 (J) H = -1189833.66 (J) S = 272.16 (J/K) V = 38.42 (cc) Cp = 141.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.15 | 0.82 | 13.59 | 1.26 | 0.00 | 6.39 | 0.09 | 3.23 | 0.00 | 0.00 | 4.25 | 3.46 | 2.55 | 0.18 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.14 (gm) density = 3.28 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.43Mg1.48Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -33758.03 (J) H = -25755.49 (J) S = 5.25 (J/K) V = 0.65 (cc) Cp = 2.68 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-44.58 96.01 43.01 2.99 -2.72 5.05 0.24

Total solids mass = 2.14 (gm) density = 3.28 (gm/cc)
G = -33758.03 (J) H = -25755.49 (J) S = 5.25 (J/K) V = 0.65 (cc) Cp = 2.68 (J/K)

Viscosity of the System: 3.43 (log 10 poise)

System mass = 100.00 (gm) density = 2.56 (gm/cc)
G = -1638136.53 (J) H = -1215589.15 (J) S = 277.42 (J/K) V = 39.08 (cc) Cp = 143.78 (J/K)

Oxygen delta moles = -5.57005e-05 delta grams = -0.00178235
G = 19.63 (J) H = -2.31 (J) S = -0.01 (J/K) V = -7.05 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1240.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.12 delta HM = -4.84 NNO = 0.00 QFM = 0.24 COH = 2.19 IW = 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 97.00 (gm) density = 2.55 (gm/cc) viscosity = 3.49 (log 10 poise) (analysis in wt %)
G = -1588261.00 (J) H = -1181374.68 (J) S = 268.90 (J/K) V = 38.10 (cc) Cp = 139.72 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.24 0.83 13.69 1.25 0.00 6.31 0.09 3.02 0.00 0.00 4.28 3.49 2.58 0.18 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.00 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.45Mg1.46Fe'"0.02Ti0.00Al0.08Si1.95O6
G = -47089.06 (J) H = -35989.46 (J) S = 7.34 (J/K) V = 0.91 (cc) Cp = 3.75 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-46.01 95.79 44.54 3.06 -2.78 5.15 0.25

Total solids mass = 3.00 (gm) density = 3.29 (gm/cc)
G = -47089.06 (J) H = -35989.46 (J) S = 7.34 (J/K) V = 0.91 (cc) Cp = 3.75 (J/K)

Viscosity of the System: 3.53 (log 10 poise)

System mass = 100.00 (gm) density = 2.56 (gm/cc)
G = -1635350.06 (J) H = -1217364.14 (J) S = 276.24 (J/K) V = 39.01 (cc) Cp = 143.47 (J/K)

Oxygen delta moles = -8.82688e-05 delta grams = -0.0028245
G = 30.88 (J) H = -3.62 (J) S = -0.02 (J/K) V = -11.10 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 96.16 (gm) density = 2.55 (gm/cc) viscosity = 3.57 (log 10 poise) (analysis in wt %)
G = -1572651.90 (J) H = -1173245.27 (J) S = 265.71 (J/K) V = 37.78 (cc) Cp = 138.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.33 | 0.84 | 13.79 | 1.24 | 0.00 | 6.23 | 0.09 | 2.83 | 0.00 | 0.00 | 4.30 | 3.52 | 2.60 | 0.18 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.84 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.46Mg1.44Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -59922.11 (J) H = -45877.56 (J) S = 9.34 (J/K) V = 1.16 (cc) Cp = 4.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -47.47 | 95.56 | 46.10 | 3.14 | -2.86 | 5.26 | 0.26 |

Total solids mass = 3.84 (gm) density = 3.29 (gm/cc)
G = -59922.11 (J) H = -45877.56 (J) S = 9.34 (J/K) V = 1.16 (cc) Cp = 4.78 (J/K)

Viscosity of the System: 3.62 (log 10 poise)

System mass = 100.00 (gm) density = 2.57 (gm/cc)
G = -1632574.01 (J) H = -1219122.83 (J) S = 275.06 (J/K) V = 38.95 (cc) Cp = 143.16 (J/K)

Oxygen delta moles = -0.00012338 delta grams = -0.00394801
G = 42.85 (J) H = -5.02 (J) S = -0.03 (J/K) V = -15.42 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 95.34 (gm) density = 2.54 (gm/cc) viscosity = 3.65 (log 10 poise) (analysis in wt %)
G = -1557510.98 (J) H = -1165418.03 (J) S = 262.59 (J/K) V = 37.47 (cc) Cp = 137.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.84 | 13.89 | 1.23 | 0.00 | 6.14 | 0.10 | 2.65 | 0.00 | 0.00 | 4.33 | 3.55 | 2.62 | 0.18 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.66 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.48Mg1.42Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -72297.28 (J) H = -55448.42 (J) S = 11.28 (J/K) V = 1.41 (cc) Cp = 5.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -48.96 | 95.32 | 47.70 | 3.21 | -2.93 | 5.37 | 0.27 |

Total solids mass = 4.66 (gm) density = 3.30 (gm/cc)
G = -72297.28 (J) H = -55448.42 (J) S = 11.28 (J/K) V = 1.41 (cc) Cp = 5.78 (J/K)

Viscosity of the System: 3.72 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1629808.26 (J) H = -1220866.45 (J) S = 273.88 (J/K) V = 38.88 (cc) Cp = 142.87 (J/K)

Oxygen delta moles = -0.000161188 delta grams = -0.00515783

G = 55.56 (J)  H = -6.50 (J)  S = -0.04 (J/K)  V = -20.01 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1210.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.45  delta HM = -4.85  NNO = 0.00  QFM = 0.22  COH = 2.14  IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.54 (gm)  density = 2.54 (gm/cc)  viscosity = 3.74 (log 10 poise)  (analysis in wt %)
G = -1542801.61 (J)  H = -1157867.85 (J)  S = 259.54 (J/K)  V = 37.17 (cc)  Cp = 135.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.51 | 0.85 | 13.99 | 1.22 | 0.00 | 6.04 | 0.10 | 2.47 | 0.00 | 0.00 | 4.35 | 3.58 | 2.64 | 0.18 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.46 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.49Mg1.40Fe'''0.02Ti0.00Al0.09Si1.94O6
G = -84251.13 (J)  H = -64728.27 (J)  S = 13.16 (J/K)  V = 1.65 (cc)  Cp = 6.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.47 | 95.08 | 49.34 | 3.30 | -3.01 | 5.49 | 0.28 |

Total solids  mass = 5.46 (gm)  density = 3.31 (gm/cc)
G = -84251.13 (J)  H = -64728.27 (J)  S = 13.16 (J/K)  V = 1.65 (cc)  Cp = 6.75 (J/K)

Viscosity of the System: 3.82 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.58 (gm/cc)
G = -1627052.74 (J)  H = -1222596.12 (J)  S = 272.70 (J/K)  V = 38.82 (cc)  Cp = 142.59 (J/K)

Oxygen  delta moles = -0.000201837  delta grams = -0.00645854
G = 69.06 (J)  H = -8.07 (J)  S = -0.05 (J/K)  V = -24.89 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1200.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.56  delta HM = -4.85  NNO = 0.00  QFM = 0.22  COH = 2.12  IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.75 (gm)  density = 2.54 (gm/cc)  viscosity = 3.83 (log 10 poise)  (analysis in wt %)
G = -1528488.19 (J)  H = -1150529.20 (J)  S = 256.57 (J/K)  V = 36.88 (cc)  Cp = 128.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.60 | 0.86 | 14.08 | 1.21 | 0.00 | 5.94 | 0.10 | 2.31 | 0.00 | 0.00 | 4.38 | 3.61 | 2.66 | 0.18 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.24 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.51Mg1.38Fe'''0.03Ti0.00Al0.09Si1.94O6
G = -95819.09 (J)  H = -73742.73 (J)  S = 14.99 (J/K)  V = 1.88 (cc)  Cp = 7.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.01 | 94.82 | 51.00 | 3.38 | -3.09 | 5.61 | 0.29 |

Total solids mass = 6.24 (gm) density = 3.32 (gm/cc)
G = -95819.09 (J) H = -73742.73 (J) S = 14.99 (J/K) V = 1.88 (cc) Cp = 7.70 (J/K)

Viscosity of the System: 3.91 (log 10 poise)

System mass = 99.99 (gm) density = 2.58 (gm/cc)
G = -1624307.28 (J) H = -1224271.93 (J) S = 271.55 (J/K) V = 38.76 (cc) Cp = 136.32 (J/K)

Oxygen delta moles = -0.000245467 delta grams = -0.00785466
G = 83.35 (J) H = -9.72 (J) S = -0.06 (J/K) V = -30.07 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 92.98 (gm) density = 2.54 (gm/cc) viscosity = 3.91 (log 10 poise) (analysis in wt %)
G = -1514534.08 (J) H = -1143399.01 (J) S = 253.65 (J/K) V = 36.59 (cc) Cp = 127.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.70 | 0.86 | 14.18 | 1.20 | 0.00 | 5.83 | 0.10 | 2.15 | 0.00 | 0.00 | 4.40 | 3.64 | 2.69 | 0.18 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.01 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.53Mg1.36Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -107037.43 (J) H = -82518.37 (J) S = 16.76 (J/K) V = 2.11 (cc) Cp = 8.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.56 | 94.55 | 52.68 | 3.47 | -3.18 | 5.73 | 0.31 |

Total solids mass = 7.01 (gm) density = 3.33 (gm/cc)
G = -107037.43 (J) H = -82518.37 (J) S = 16.76 (J/K) V = 2.11 (cc) Cp = 8.62 (J/K)

Viscosity of the System: 4.01 (log 10 poise)

System mass = 99.99 (gm) density = 2.58 (gm/cc)
G = -1621571.51 (J) H = -1225917.38 (J) S = 270.41 (J/K) V = 38.69 (cc) Cp = 136.07 (J/K)

Oxygen delta moles = -0.000292232 delta grams = -0.00935107
G = 98.48 (J) H = -11.47 (J) S = -0.08 (J/K) V = -35.55 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 92.22 (gm) density = 2.54 (gm/cc) viscosity = 4.00 (log 10 poise) (analysis in wt %)
G = -1500913.49 (J) H = -1136478.17 (J) S = 250.79 (J/K) V = 36.31 (cc) Cp = 126.29 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.81 0.87 14.27 1.18 0.00 5.70 0.10 2.00 0.00 0.00 4.42 3.67 2.71 0.19 1.09 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.77 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.54Mg1.34Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -117931.89 (J) H = -91073.91 (J) S = 18.48 (J/K) V = 2.33 (cc) Cp = 9.52 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-55.13 94.27 54.39 3.56 -3.27 5.86 0.32

Total solids mass = 7.77 (gm) density = 3.34 (gm/cc)
G = -117931.89 (J) H = -91073.91 (J) S = 18.48 (J/K) V = 2.33 (cc) Cp = 9.52 (J/K)

Viscosity of the System: 4.11 (log 10 poise)

System mass = 99.99 (gm) density = 2.59 (gm/cc)
G = -1618845.38 (J) H = -1227552.08 (J) S = 269.27 (J/K) V = 38.63 (cc) Cp = 135.81 (J/K)

Oxygen delta moles = -0.000342235 delta grams = -0.0109511
G = 114.45 (J) H = -13.30 (J) S = -0.09 (J/K) V = -41.35 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 91.48 (gm) density = 2.54 (gm/cc) viscosity = 4.09 (log 10 poise) (analysis in wt %)
G = -1487604.48 (J) H = -1129751.24 (J) S = 247.97 (J/K) V = 36.03 (cc) Cp = 125.16 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.91 0.88 14.37 1.16 0.00 5.57 0.10 1.86 0.00 0.00 4.44 3.70 2.73 0.19 1.10 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.51 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.56Mg1.31Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -128524.38 (J) H = -99425.40 (J) S = 20.16 (J/K) V = 2.54 (cc) Cp = 10.40 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-56.72 93.99 56.11 3.66 -3.36 5.99 0.33

Total solids mass = 8.51 (gm) density = 3.34 (gm/cc)
G = -128524.38 (J) H = -99425.40 (J) S = 20.16 (J/K) V = 2.54 (cc) Cp = 10.40 (J/K)

Viscosity of the System: 4.21 (log 10 poise)

System mass = 99.99 (gm) density = 2.59 (gm/cc)
G = -1616128.86 (J) H = -1229176.64 (J) S = 268.13 (J/K) V = 38.57 (cc) Cp = 135.56 (J/K)

Oxygen delta moles = -0.000395558 delta grams = -0.0126574
G = 131.27 (J) H = -15.23 (J) S = -0.10 (J/K) V = -47.46 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1160.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.19  COH = 2.05  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 90.74 (gm)  density = 2.54 (gm/cc)  viscosity = 4.18 (log 10 poise)  (analysis in wt %)
G = -1474588.39 (J)  H = -1123204.99 (J)  S = 245.18 (J/K)  V = 35.76 (cc)  Cp = 124.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.02 | 0.88 | 14.46 | 1.14 | 0.00 | 5.44 | 0.10 | 1.73 | 0.00 | 0.00 | 4.45 | 3.73 | 2.75 | 0.19 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.25 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.58Mg1.29Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -138833.57 (J)  H = -107586.56 (J)  S = 21.80 (J/K)  V = 2.76 (cc)  Cp = 11.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.30 | 93.70 | 57.84 | 3.76 | -3.46 | 6.12 | 0.35 |

Total solids  mass = 9.25 (gm)  density = 3.35 (gm/cc)
G = -138833.57 (J)  H = -107586.56 (J)  S = 21.80 (J/K)  V = 2.76 (cc)  Cp = 11.26 (J/K)

Viscosity of the System: 4.32 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.60 (gm/cc)
G = -1613421.95 (J)  H = -1230791.55 (J)  S = 266.99 (J/K)  V = 38.51 (cc)  Cp = 135.31 (J/K)

Oxygen  delta moles = -0.000452254  delta grams = -0.0144716
G = 148.92 (J)  H = -17.25 (J)  S = -0.12 (J/K)  V = -53.89 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1150.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.19  COH = 2.03  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 90.01 (gm)  density = 2.54 (gm/cc)  viscosity = 4.28 (log 10 poise)  (analysis in wt %)
G = -1461849.77 (J)  H = -1116828.32 (J)  S = 242.44 (J/K)  V = 35.49 (cc)  Cp = 122.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.13 | 0.89 | 14.55 | 1.12 | 0.00 | 5.29 | 0.10 | 1.60 | 0.00 | 0.00 | 4.47 | 3.75 | 2.78 | 0.19 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.97 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.60Mg1.27Fe'"0.03Ti0.00Al0.10Si1.93O6
G = -148874.91 (J)  H = -115568.88 (J)  S = 23.40 (J/K)  V = 2.97 (cc)  Cp = 12.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.89 | 93.40 | 59.57 | 3.87 | -3.56 | 6.26 | 0.36 |

Total solids  mass = 9.97 (gm)  density = 3.36 (gm/cc)

G = -148874.91 (J)  H = -115568.88 (J)  S = 23.40 (J/K)  V = 2.97 (cc)  Cp = 12.10 (J/K)

Viscosity of the System: 4.42 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.60 (gm/cc)
G = -1610724.68 (J)  H = -1232397.20 (J)  S = 265.84 (J/K)  V = 38.45 (cc)  Cp = 135.07 (J/K)

Oxygen  delta moles = -0.000512353  delta grams = -0.0163947
G = 167.40 (J)  H = -19.36 (J)  S = -0.13 (J/K)  V = -60.62 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1140.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.18  COH = 2.01  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.29 (gm)  density = 2.53 (gm/cc)  viscosity = 4.37 (log 10 poise)  (analysis in wt %)
G = -1449376.25 (J)  H = -1110612.23 (J)  S = 239.72 (J/K)  V = 35.22 (cc)  Cp = 121.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.25 | 0.90 | 14.64 | 1.10 | 0.00 | 5.14 | 0.10 | 1.48 | 0.00 | 0.00 | 4.48 | 3.78 | 2.80 | 0.19 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.69 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.07Fe"0.61Mg1.25Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -158660.82 (J)  H = -123381.65 (J)  S = 24.96 (J/K)  V = 3.17 (cc)  Cp = 12.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.47 | 93.10 | 61.29 | 3.98 | -3.67 | 6.40 | 0.37 |

Total solids  mass = 10.69 (gm)  density = 3.37 (gm/cc)
G = -158660.82 (J)  H = -123381.65 (J)  S = 24.96 (J/K)  V = 3.17 (cc)  Cp = 12.93 (J/K)

Viscosity of the System: 4.53 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.60 (gm/cc)
G = -1608037.07 (J)  H = -1233993.88 (J)  S = 264.69 (J/K)  V = 38.40 (cc)  Cp = 134.83 (J/K)

Oxygen  delta moles = -0.000575854  delta grams = -0.0184266
G = 186.67 (J)  H = -21.55 (J)  S = -0.15 (J/K)  V = -67.66 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1130.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.17  COH = 1.99  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 87.67 (gm)  density = 2.53 (gm/cc)  viscosity = 4.50 (log 10 poise)  (analysis in wt %)
G = -1424663.34 (J)  H = -1095316.73 (J)  S = 234.72 (J/K)  V = 34.67 (cc)  Cp = 119.59 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

64.60 0.91 14.79 1.04 0.00 4.79 0.10 1.38 0.00 0.00 4.36 3.85 2.85 0.20 1.15 0.00 0.00 0.00 0.00

orthopyroxene mass = 4.63 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.62Mg1.24Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -68415.53 (J) H = -53323.05 (J) S = 10.76 (J/K) V = 1.37 (cc) Cp = 5.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.37 | 93.07 | 62.09 | 4.11 | -3.79 | 6.49 | 0.39 |

clinopyroxene mass = 7.69 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.65Mg1.09Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -112275.60 (J) H = -87171.18 (J) S = 17.89 (J/K) V = 2.28 (cc) Cp = 9.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.79 | 84.31 | 65.27 | 5.13 | -4.53 | 8.54 | 1.07 |

Total solids mass = 12.31 (gm) density = 3.38 (gm/cc)
G = -180691.12 (J) H = -140494.23 (J) S = 28.65 (J/K) V = 3.65 (cc) Cp = 14.70 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 99.98 (gm) density = 2.61 (gm/cc)
G = -1605354.46 (J) H = -1235810.96 (J) S = 263.37 (J/K) V = 38.31 (cc) Cp = 134.29 (J/K)

Oxygen delta moles = -0.000652897 delta grams = -0.0208919
G = 209.97 (J) H = -24.19 (J) S = -0.17 (J/K) V = -76.17 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 86.23 (gm) density = 2.52 (gm/cc) viscosity = 4.62 (log 10 poise) (analysis in wt %)
G = -1402624.95 (J) H = -1081880.25 (J) S = 230.23 (J/K) V = 34.17 (cc) Cp = 117.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.91 | 0.92 | 14.92 | 0.98 | 0.00 | 4.48 | 0.11 | 1.27 | 0.00 | 0.00 | 4.25 | 3.90 | 2.90 | 0.20 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 13.74 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.66Mg1.08Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -200061.71 (J) H = -155696.35 (J) S = 31.85 (J/K) V = 4.06 (cc) Cp = 16.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.10 | 83.77 | 65.88 | 5.30 | -4.67 | 8.67 | 1.15 |

Total solids mass = 13.74 (gm) density = 3.38 (gm/cc)
G = -200061.71 (J) H = -155696.35 (J) S = 31.85 (J/K) V = 4.06 (cc) Cp = 16.25 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 99.98 (gm) density = 2.61 (gm/cc)
G = -1602686.66 (J) H = -1237576.60 (J) S = 262.08 (J/K) V = 38.24 (cc) Cp = 133.81 (J/K)

Oxygen delta moles = -0.000726925 delta grams = -0.0232607
G = 231.92 (J) H = -26.67 (J) S = -0.19 (J/K) V = -84.20 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1110.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.16 COH = 1.95 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 85.33 (gm) density = 2.52 (gm/cc) viscosity = 4.72 (log 10 poise) (analysis in wt %)
G = -1387792.04 (J) H = -1073691.52 (J) S = 227.09 (J/K) V = 33.85 (cc) Cp = 116.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.09 | 0.92 | 15.02 | 0.94 | 0.00 | 4.29 | 0.11 | 1.17 | 0.00 | 0.00 | 4.21 | 3.94 | 2.93 | 0.20 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 14.64 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.67Mg1.05Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -212243.85 (J) H = -165532.77 (J) S = 33.77 (J/K) V = 4.32 (cc) Cp = 17.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.26 | 82.54 | 66.85 | 5.52 | -4.85 | 8.94 | 1.25 |

Total solids mass = 14.64 (gm) density = 3.39 (gm/cc)
G = -212243.85 (J) H = -165532.77 (J) S = 33.77 (J/K) V = 4.32 (cc) Cp = 17.26 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 99.97 (gm) density = 2.62 (gm/cc)
G = -1600035.90 (J) H = -1239224.30 (J) S = 260.86 (J/K) V = 38.17 (cc) Cp = 133.49 (J/K)

Oxygen delta moles = -0.000792679 delta grams = -0.0253648
G = 250.88 (J) H = -28.80 (J) S = -0.20 (J/K) V = -91.16 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1100.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.93 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 84.43 (gm) density = 2.52 (gm/cc) viscosity = 4.83 (log 10 poise) (analysis in wt %)
G = -1372985.51 (J) H = -1065459.12 (J) S = 223.96 (J/K) V = 33.53 (cc) Cp = 114.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.28 | 0.93 | 15.12 | 0.91 | 0.00 | 4.09 | 0.11 | 1.08 | 0.00 | 0.00 | 4.16 | 3.97 | 2.96 | 0.20 | 1.19 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 15.55 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.17Fe"0.68Mg1.03Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -224411.67 (J) H = -175411.61 (J) S = 35.68 (J/K) V = 4.58 (cc) Cp = 18.26 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-60.22 81.21 67.70 5.74 -5.02 9.21 1.37

Total solids mass = 15.55 (gm) density = 3.40 (gm/cc)
G = -224411.67 (J) H = -175411.61 (J) S = 35.68 (J/K) V = 4.58 (cc) Cp = 18.26 (J/K)

Viscosity of the System: 5.07 (log 10 poise)

System mass = 99.97 (gm) density = 2.62 (gm/cc)
G = -1597397.19 (J) H = -1240870.73 (J) S = 259.64 (J/K) V = 38.11 (cc) Cp = 133.18 (J/K)

Oxygen delta moles = -0.000858737 delta grams = -0.0274785
G = 269.60 (J) H = -30.89 (J) S = -0.22 (J/K) V = -98.04 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1090.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.91 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 83.52 (gm) density = 2.52 (gm/cc) viscosity = 4.94 (log 10 poise) (analysis in wt %)
G = -1358185.81 (J) H = -1057165.10 (J) S = 220.83 (J/K) V = 33.20 (cc) Cp = 113.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.48 | 0.94 | 15.22 | 0.87 | 0.00 | 3.88 | 0.11 | 0.99 | 0.00 | 0.00 | 4.09 | 4.01 | 2.99 | 0.21 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 16.45 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.68Mg1.00Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -236585.17 (J) H = -185351.45 (J) S = 37.58 (J/K) V = 4.84 (cc) Cp = 19.26 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-59.96 79.77 68.42 5.97 -5.20 9.48 1.51

Total solids mass = 16.45 (gm) density = 3.40 (gm/cc)
G = -236585.17 (J) H = -185351.45 (J) S = 37.58 (J/K) V = 4.84 (cc) Cp = 19.26 (J/K)

Viscosity of the System: 5.20 (log 10 poise)

System mass = 99.97 (gm) density = 2.63 (gm/cc)
G = -1594770.98 (J) H = -1242516.55 (J) S = 258.41 (J/K) V = 38.04 (cc) Cp = 132.86 (J/K)

Oxygen delta moles = -0.000924422 delta grams = -0.0295804
G = 287.87 (J) H = -32.92 (J) S = -0.24 (J/K) V = -104.77 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1080.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.14 COH = 1.89 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 81.15 (gm) density = 2.51 (gm/cc) viscosity = 5.05 (log 10 poise) (analysis in wt %)
G = -1319266.26 (J) H = -1029790.15 (J) S = 213.93 (J/K) V = 32.32 (cc) Cp = 110.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.82 | 0.96 | 15.15 | 0.84 | 0.00 | 3.70 | 0.11 | 0.90 | 0.00 | 0.00 | 3.99 | 4.01 | 3.07 | 0.21 | 1.24 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 17.39 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.70Mg0.98Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -248749.77 (J) H = -195272.75 (J) S = 39.52 (J/K) V = 5.10 (cc) Cp = 20.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.80 | 79.10 | 69.75 | 6.02 | -5.22 | 9.55 | 1.59 |

feldspar mass = 1.43 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.59Ca0.38Al1.38Si2.62O8
G = -24124.39 (J) H = -19467.09 (J) S = 3.44 (J/K) V = 0.55 (cc) Cp = 1.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.57 | 38.10 | 3.34 |

Total solids mass = 18.82 (gm) density = 3.33 (gm/cc)
G = -272874.17 (J) H = -214739.84 (J) S = 42.96 (J/K) V = 5.64 (cc) Cp = 22.03 (J/K)

Viscosity of the System: 5.35 (log 10 poise)

System mass = 99.97 (gm) density = 2.63 (gm/cc)
G = -1592140.42 (J) H = -1244529.99 (J) S = 256.89 (J/K) V = 37.96 (cc) Cp = 132.27 (J/K)

Oxygen delta moles = -0.00102217 delta grams = -0.0327082
G = 315.70 (J) H = -36.03 (J) S = -0.26 (J/K) V = -115.00 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1070.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.87 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 77.48 (gm) density = 2.51 (gm/cc) viscosity = 5.14 (log 10 poise) (analysis in wt %)
G = -1258999.57 (J) H = -985374.99 (J) S = 203.72 (J/K) V = 30.93 (cc) Cp = 105.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.27 | 1.01 | 14.92 | 0.81 | 0.00 | 3.54 | 0.12 | 0.83 | 0.00 | 0.00 | 3.87 | 3.95 | 3.19 | 0.22 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 18.29 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.72Mg0.96Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -260028.26 (J) H = -204476.87 (J) S = 41.36 (J/K) V = 5.35 (cc) Cp = 21.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.79 | 79.25 | 71.73 | 5.90 | -5.07 | 9.38 | 1.60 |

feldspar mass = 4.19 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.59Ca0.37Al1.37Si2.63O8
G = -70481.04 (J) H = -56996.16 (J) S = 10.04 (J/K) V = 1.60 (cc) Cp = 5.12 (J/K)

albite anorthite sanidine
59.49 36.96 3.55

Total solids mass = 22.48 (gm) density = 3.24 (gm/cc)
G = -330509.29 (J) H = -261473.03 (J) S = 51.40 (J/K) V = 6.95 (cc) Cp = 26.38 (J/K)

Viscosity of the System: 5.54 (log 10 poise)

System mass = 99.96 (gm) density = 2.64 (gm/cc)
G = -1589508.86 (J) H = -1246848.02 (J) S = 255.12 (J/K) V = 37.87 (cc) Cp = 131.44 (J/K)

Oxygen delta moles = -0.00115366 delta grams = -0.0369157
G = 353.38 (J) H = -40.24 (J) S = -0.29 (J/K) V = -128.83 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1060.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.84 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 74.09 (gm) density = 2.50 (gm/cc) viscosity = 5.23 (log 10 poise) (analysis in wt %)
G = -1203232.61 (J) H = -944261.45 (J) S = 194.26 (J/K) V = 29.64 (cc) Cp = 100.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.71 | 1.05 | 14.69 | 0.77 | 0.00 | 3.36 | 0.12 | 0.76 | 0.00 | 0.00 | 3.75 | 3.88 | 3.31 | 0.23 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 19.12 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.74Mg0.95Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -270235.00 (J) H = -212886.85 (J) S = 43.02 (J/K) V = 5.58 (cc) Cp = 22.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.57 | 79.34 | 73.55 | 5.78 | -4.92 | 9.21 | 1.61 |

feldspar mass = 6.76 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.60Ca0.36Al1.36Si2.64O8
G = -113427.71 (J) H = -91923.47 (J) S = 16.13 (J/K) V = 2.58 (cc) Cp = 8.25 (J/K)

albite anorthite sanidine
60.32 35.92 3.76

Total solids mass = 25.87 (gm) density = 3.17 (gm/cc)
G = -383662.71 (J) H = -304810.32 (J) S = 59.15 (J/K) V = 8.16 (cc) Cp = 30.40 (J/K)

Viscosity of the System: 5.73 (log 10 poise)

System mass = 99.96 (gm) density = 2.64 (gm/cc)
G = -1586895.32 (J) H = -1249071.77 (J) S = 253.40 (J/K) V = 37.79 (cc) Cp = 130.67 (J/K)

Oxygen delta moles = -0.00128424 delta grams = -0.0410943
G = 390.12 (J) H = -44.34 (J) S = -0.33 (J/K) V = -142.35 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1050.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.12  COH = 1.82  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 70.94 (gm)  density = 2.49 (gm/cc)  viscosity = 5.33 (log 10 poise)  (analysis in wt %)
G = -1151653.28 (J)  H = -906224.44 (J)  S = 185.49 (J/K)  V = 28.44 (cc)  Cp = 95.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.14 | 1.09 | 14.48 | 0.74 | 0.00 | 3.18 | 0.13 | 0.69 | 0.00 | 0.00 | 3.65 | 3.80 | 3.43 | 0.24 | 1.42 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 19.88 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.75Mg0.93Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -279463.21 (J)  H = -220573.82 (J)  S = 44.51 (J/K)  V = 5.79 (cc)  Cp = 22.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.13 | 79.37 | 75.23 | 5.66 | -4.77 | 9.02 | 1.62 |

feldspar  mass = 9.14 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.04Na0.61Ca0.35Al1.35Si2.65O8
G = -153183.22 (J)  H = -124410.40 (J)  S = 21.75 (J/K)  V = 3.49 (cc)  Cp = 11.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.08 | 34.95 | 3.97 |

Total solids  mass = 29.02 (gm)  density = 3.13 (gm/cc)
G = -432646.42 (J)  H = -344984.22 (J)  S = 66.25 (J/K)  V = 9.28 (cc)  Cp = 34.11 (J/K)

Viscosity of the System: 5.92 (log 10 poise)

System  mass = 99.95 (gm)  density = 2.65 (gm/cc)
G = -1584299.70 (J)  H = -1251208.65 (J)  S = 251.74 (J/K)  V = 37.72 (cc)  Cp = 129.96 (J/K)

Oxygen  delta moles = -0.00141309  delta grams = -0.0452171
G = 425.68 (J)  H = -48.28 (J)  S = -0.36 (J/K)  V = -155.45 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1040.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.11  COH = 1.80  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 68.03 (gm)  density = 2.49 (gm/cc)  viscosity = 5.42 (log 10 poise)  (analysis in wt %)
G = -1103960.61 (J)  H = -871046.55 (J)  S = 177.37 (J/K)  V = 27.33 (cc)  Cp = 91.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.55 | 1.14 | 14.28 | 0.70 | 0.00 | 3.00 | 0.13 | 0.64 | 0.00 | 0.00 | 3.55 | 3.72 | 3.55 | 0.25 | 1.48 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 20.57 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.77Mg0.92Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -287797.47 (J)  H = -227601.68 (J)  S = 45.84 (J/K)  V = 5.98 (cc)  Cp = 23.70 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-67.48 79.35 76.75 5.55 -4.63 8.83 1.63

feldspar mass = 11.35 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.34Al1.34Si2.66O8
G = -189963.84 (J) H = -154617.77 (J) S = 26.92 (J/K) V = 4.33 (cc) Cp = 13.94 (J/K)
albite anorthite sanidine
61.76 34.05 4.19

Total solids mass = 31.93 (gm) density = 3.10 (gm/cc)
G = -477761.30 (J) H = -382219.45 (J) S = 72.76 (J/K) V = 10.31 (cc) Cp = 37.64 (J/K)

Viscosity of the System: 6.11 (log 10 poise)

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1581721.91 (J) H = -1253266.00 (J) S = 250.13 (J/K) V = 37.64 (cc) Cp = 129.41 (J/K)

Oxygen delta moles = -0.00153942 delta grams = -0.0492596
G = 459.83 (J) H = -52.04 (J) S = -0.39 (J/K) V = -168.07 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1030.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.10 COH = 1.78 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 65.33 (gm) density = 2.48 (gm/cc) viscosity = 5.51 (log 10 poise) (analysis in wt %)
G = -1059854.76 (J) H = -838510.11 (J) S = 169.85 (J/K) V = 26.30 (cc) Cp = 88.00 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.95 1.18 14.09 0.67 0.00 2.82 0.14 0.59 0.00 0.00 3.46 3.63 3.67 0.26 1.54 0.00 0.00 0.00 0.00

clinopyroxene mass = 21.21 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.78Mg0.90Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -295316.59 (J) H = -234029.48 (J) S = 47.03 (J/K) V = 6.15 (cc) Cp = 24.37 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-68.63 79.29 78.13 5.44 -4.50 8.62 1.64

feldspar mass = 13.41 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.33Al1.33Si2.67O8
G = -223990.50 (J) H = -182711.64 (J) S = 31.68 (J/K) V = 5.12 (cc) Cp = 16.45 (J/K)
albite anorthite sanidine
62.38 33.23 4.39

Total solids mass = 34.62 (gm) density = 3.07 (gm/cc)
G = -519307.09 (J) H = -416741.12 (J) S = 78.71 (J/K) V = 11.27 (cc) Cp = 40.82 (J/K)

Viscosity of the System: 6.31 (log 10 poise)

System mass = 99.95 (gm) density = 2.66 (gm/cc)
G = -1579161.84 (J) H = -1255251.23 (J) S = 248.56 (J/K) V = 37.57 (cc) Cp = 128.82 (J/K)

Oxygen delta moles = -0.00166257 delta grams = -0.0532003
G = 492.41 (J) H = -55.60 (J) S = -0.42 (J/K) V = -180.14 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1020.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.10 COH = 1.76 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 62.84 (gm) density = 2.48 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -1019054.49 (J) H = -808411.02 (J) S = 162.89 (J/K) V = 25.34 (cc) Cp = 84.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.34 | 1.22 | 13.91 | 0.63 | 0.00 | 2.64 | 0.14 | 0.54 | 0.00 | 0.00 | 3.38 | 3.54 | 3.78 | 0.27 | 1.60 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 21.79 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.79Mg0.89Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -302095.10 (J) H = -239912.65 (J) S = 48.09 (J/K) V = 6.31 (cc) Cp = 24.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.60 | 79.19 | 79.37 | 5.34 | -4.37 | 8.41 | 1.65 |

feldspar mass = 15.31 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.63Ca0.32Al1.32Si2.68O8
G = -255469.78 (J) H = -208846.34 (J) S = 36.05 (J/K) V = 5.85 (cc) Cp = 18.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.94 | 32.45 | 4.60 |

Total solids mass = 37.11 (gm) density = 3.05 (gm/cc)
G = -557564.88 (J) H = -448758.99 (J) S = 84.14 (J/K) V = 12.16 (cc) Cp = 43.75 (J/K)

Viscosity of the System: 6.51 (log 10 poise)

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1576619.37 (J) H = -1257170.01 (J) S = 247.03 (J/K) V = 37.51 (cc) Cp = 128.27 (J/K)

Oxygen delta moles = -0.00178198 delta grams = -0.0570212
G = 523.27 (J) H = -58.95 (J) S = -0.45 (J/K) V = -191.59 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1010.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.09 COH = 1.73 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 60.53 (gm) density = 2.47 (gm/cc) viscosity = 5.69 (log 10 poise) (analysis in wt %)
G = -981294.09 (J) H = -780556.22 (J) S = 156.44 (J/K) V = 24.46 (cc) Cp = 81.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

68.71 1.27 13.73 0.59 0.00 2.46 0.15 0.50 0.00 0.00 3.30 3.44 3.89 0.28 1.66 0.00 0.00 0.00 0.00

clinopyroxene mass = 22.32 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.80Mg0.88Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -308203.64 (J) H = -245303.47 (J) S = 49.02 (J/K) V = 6.46 (cc) Cp = 25.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.39 | 79.06 | 80.48 | 5.24 | -4.24 | 8.19 | 1.67 |

feldspar mass = 17.09 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.63Ca0.32Al1.32Si2.68O8
G = -284596.60 (J) H = -233168.46 (J) S = 40.08 (J/K) V = 6.53 (cc) Cp = 20.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.46 | 31.74 | 4.80 |

Total solids mass = 39.41 (gm) density = 3.04 (gm/cc)
G = -592800.24 (J) H = -478471.93 (J) S = 89.10 (J/K) V = 12.98 (cc) Cp = 46.45 (J/K)

Viscosity of the System: 6.72 (log 10 poise)

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1574094.34 (J) H = -1259028.16 (J) S = 245.54 (J/K) V = 37.44 (cc) Cp = 127.75 (J/K)

Oxygen delta moles = -0.0018972 delta grams = -0.060708
G = 552.31 (J) H = -62.08 (J) S = -0.48 (J/K) V = -202.40 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 58.39 (gm) density = 2.47 (gm/cc) viscosity = 5.78 (log 10 poise) (analysis in wt %)
G = -946321.67 (J) H = -754762.36 (J) S = 150.46 (J/K) V = 23.64 (cc) Cp = 78.33 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.07 | 1.31 | 13.57 | 0.56 | 0.00 | 2.29 | 0.16 | 0.47 | 0.00 | 0.00 | 3.23 | 3.34 | 4.00 | 0.29 | 1.73 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 22.81 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.81Mg0.87Fe'"0.04Ti0.01Al0.15Si1.91O6
G = -313708.83 (J) H = -250251.04 (J) S = 49.84 (J/K) V = 6.59 (cc) Cp = 26.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.03 | 78.89 | 81.47 | 5.15 | -4.12 | 7.97 | 1.68 |

feldspar mass = 18.73 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.64Ca0.31Al1.31Si2.69O8
G = -311556.06 (J) H = -255817.74 (J) S = 43.78 (J/K) V = 7.16 (cc) Cp = 22.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.93 | 31.07 | 5.01 |

Total solids mass = 41.54 (gm) density = 3.02 (gm/cc)

G = -625264.89 (J)  H = -506068.78 (J)  S = 93.62 (J/K)  V = 13.75 (cc)  Cp = 48.94 (J/K)

Viscosity of the System: 6.93 (log 10 poise)

System  mass = 99.94 (gm)  density = 2.67 (gm/cc)
G = -1571586.56 (J)  H = -1260831.14 (J)  S = 244.08 (J/K)  V = 37.38 (cc)  Cp = 127.27 (J/K)

Oxygen  delta moles = -0.0020079  delta grams = -0.0642503
G = 579.48 (J)  H = -64.98 (J)  S = -0.51 (J/K)  V = -212.54 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 990.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.68  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 56.42 (gm)  density = 2.47 (gm/cc)  viscosity = 5.87 (log 10 poise)  (analysis in wt %)
G = -913960.73 (J)  H = -730907.20 (J)  S = 144.92 (J/K)  V = 22.88 (cc)  Cp = 75.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.41 | 1.35 | 13.41 | 0.52 | 0.00 | 2.13 | 0.16 | 0.44 | 0.00 | 0.00 | 3.16 | 3.23 | 4.10 | 0.30 | 1.79 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 23.19 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.82Mg0.86Fe'"0.04Ti0.01Al0.14Si1.91O6
G = -317793.05 (J)  H = -254088.29 (J)  S = 50.43 (J/K)  V = 6.69 (cc)  Cp = 26.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.71 | 78.80 | 82.42 | 5.06 | -4.01 | 7.75 | 1.68 |

clinopyroxene  mass = 0.07 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.74Fe"0.41Mg0.61Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -1045.15 (J)  H = -851.88 (J)  S = 0.15 (J/K)  V = 0.02 (cc)  Cp = 0.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.30 | 19.79 | 40.91 | 8.58 | -1.44 | 8.07 | 5.79 |

feldspar  mass = 20.25 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.64Ca0.30Al1.30Si2.70O8
G = -336298.06 (J)  H = -276740.63 (J)  S = 47.15 (J/K)  V = 7.74 (cc)  Cp = 24.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.38 | 30.41 | 5.21 |

Total solids  mass = 43.51 (gm)  density = 3.01 (gm/cc)
G = -655136.26 (J)  H = -531680.80 (J)  S = 97.74 (J/K)  V = 14.45 (cc)  Cp = 51.24 (J/K)

Viscosity of the System: 7.16 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.68 (gm/cc)
G = -1569096.99 (J)  H = -1262587.99 (J)  S = 242.65 (J/K)  V = 37.33 (cc)  Cp = 126.81 (J/K)

Oxygen  delta moles = -0.00211173  delta grams = -0.0675727
G = 604.12 (J)  H = -67.59 (J)  S = -0.53 (J/K)  V = -221.78 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 980.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.07  COH = 1.66  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 54.73 (gm)  density = 2.46 (gm/cc)  viscosity = 5.95 (log 10 poise)  (analysis in wt %)
G = -885438.02 (J)  H = -709889.18 (J)  S = 140.09 (J/K)  V = 22.21 (cc)  Cp = 73.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.69 | 1.36 | 13.26 | 0.51 | 0.00 | 2.09 | 0.17 | 0.39 | 0.00 | 0.00 | 3.07 | 3.12 | 4.19 | 0.31 | 1.84 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.39 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.89Mg0.98Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -127493.58 (J)  H = -102154.62 (J)  S = 20.22 (J/K)  V = 2.68 (cc)  Cp = 10.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.86 | 93.95 | 88.83 | 4.24 | -3.84 | 6.28 | 0.41 |

clinopyroxene  mass = 11.46 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.87Mg0.83Fe'"0.04Ti0.01Al0.15Si1.91O6
G = -155268.62 (J)  H = -124239.68 (J)  S = 24.76 (J/K)  V = 3.29 (cc)  Cp = 12.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.49 | 79.38 | 86.57 | 5.01 | -3.97 | 7.84 | 1.66 |

clinopyroxene  mass = 2.70 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.75Fe"0.42Mg0.59Fe'"0.07Ti0.04Al0.23Si1.84O6
G = -39405.02 (J)  H = -32171.05 (J)  S = 5.77 (J/K)  V = 0.80 (cc)  Cp = 3.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.69 | 19.02 | 42.49 | 8.85 | -1.03 | 8.01 | 5.97 |

feldspar  mass = 21.66 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -359043.68 (J)  H = -296108.03 (J)  S = 50.22 (J/K)  V = 8.28 (cc)  Cp = 26.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.78 | 29.80 | 5.42 |

Total solids  mass = 45.20 (gm)  density = 3.00 (gm/cc)
G = -681210.90 (J)  H = -554673.39 (J)  S = 100.98 (J/K)  V = 15.05 (cc)  Cp = 53.30 (J/K)

Viscosity of the System: 7.38 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.68 (gm/cc)
G = -1566648.92 (J)  H = -1264562.57 (J)  S = 241.06 (J/K)  V = 37.26 (cc)  Cp = 126.49 (J/K)

Oxygen  delta moles = -0.00216685  delta grams = -0.0693366
G = 614.44 (J)  H = -68.58 (J)  S = -0.55 (J/K)  V = -225.77 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 970.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.06  COH = 1.64  IW

= 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 52.96 (gm) density = 2.46 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -856377.81 (J) H = -688431.30 (J) S = 135.10 (J/K) V = 21.54 (cc) Cp = 70.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.15 | 1.24 | 13.11 | 0.49 | 0.00 | 1.99 | 0.17 | 0.34 | 0.00 | 0.00 | 2.99 | 3.01 | 4.28 | 0.32 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.22 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.92Mg0.95Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -231590.97 (J) H = -185779.94 (J) S = 36.85 (J/K) V = 4.90 (cc) Cp = 19.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.62 | 94.18 | 92.32 | 4.24 | -3.88 | 6.37 | 0.39 |

clinopyroxene mass = 1.70 (gm) density = 3.50 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.90Mg0.80Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -22790.27 (J) H = -18257.57 (J) S = 3.65 (J/K) V = 0.49 (cc) Cp = 1.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.10 | 79.74 | 89.95 | 4.87 | -3.94 | 7.85 | 1.63 |

clinopyroxene mass = 4.82 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.75Fe"0.44Mg0.57Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -69911.87 (J) H = -57176.22 (J) S = 10.24 (J/K) V = 1.42 (cc) Cp = 5.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.43 | 18.92 | 44.21 | 8.36 | -1.03 | 8.08 | 6.03 |

feldspar mass = 23.07 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -381931.26 (J) H = -315677.82 (J) S = 53.29 (J/K) V = 8.82 (cc) Cp = 28.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.07 | 29.26 | 5.67 |

rhm-oxide mass = 0.16 (gm) density = 4.60 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.19Al0.12Ti0.84O3
G = -1624.04 (J) H = -1230.49 (J) S = 0.32 (J/K) V = 0.03 (cc) Cp = 0.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.67 | 9.47 | 70.37 | 2.42 | 6.07 |

Total solids mass = 46.97 (gm) density = 3.00 (gm/cc)
G = -707848.40 (J) H = -578122.04 (J) S = 104.35 (J/K) V = 15.66 (cc) Cp = 55.42 (J/K)

Viscosity of the System: 7.65 (log 10 poise)

System mass = 99.93 (gm) density = 2.69 (gm/cc)
G = -1564226.21 (J) H = -1266553.34 (J) S = 239.45 (J/K) V = 37.19 (cc) Cp = 126.12 (J/K)

Oxygen delta moles = -0.00220453 delta grams = -0.0705423
G = 619.58 (J) H = -68.98 (J) S = -0.55 (J/K) V = -227.86 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 960.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = 0.05  COH = 1.61  IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 51.28 (gm)  density = 2.45 (gm/cc)  viscosity = 6.15 (log 10 poise)  (analysis in wt %)
G = -829070.46 (J)  H = -668307.98 (J)  S = 130.37 (J/K)  V = 20.89 (cc)  Cp = 68.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.58 | 1.18 | 12.98 | 0.46 | 0.00 | 1.83 | 0.17 | 0.32 | 0.00 | 0.00 | 2.90 | 2.90 | 4.38 | 0.33 | 1.96 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.68 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.94Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -250098.80 (J)  H = -201054.07 (J)  S = 39.77 (J/K)  V = 5.30 (cc)  Cp = 21.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.05 | 94.35 | 93.70 | 4.21 | -3.87 | 6.29 | 0.38 |

clinopyroxene  mass = 5.38 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.76Fe"0.44Mg0.56Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -77942.77 (J)  H = -63902.75 (J)  S = 11.39 (J/K)  V = 1.58 (cc)  Cp = 6.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.10 | 18.29 | 44.33 | 8.27 | -0.93 | 7.85 | 6.09 |

feldspar  mass = 24.33 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -402076.53 (J)  H = -333057.55 (J)  S = 55.97 (J/K)  V = 9.30 (cc)  Cp = 29.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.43 | 28.66 | 5.91 |

rhm-oxide  mass = 0.26 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.18Al0.12Ti0.85O3
G = -2615.44 (J)  H = -1987.73 (J)  S = 0.51 (J/K)  V = 0.06 (cc)  Cp = 0.25 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.42 | 9.25 | 70.91 | 2.52 | 5.90 |

Total solids  mass = 48.65 (gm)  density = 2.99 (gm/cc)
G = -732733.55 (J)  H = -600002.10 (J)  S = 107.64 (J/K)  V = 16.25 (cc)  Cp = 57.37 (J/K)

Viscosity of the System: 7.96 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.69 (gm/cc)
G = -1561804.01 (J)  H = -1268310.08 (J)  S = 238.00 (J/K)  V = 37.14 (cc)  Cp = 125.72 (J/K)

Oxygen  delta moles = -0.00226988  delta grams = -0.0726335
G = 632.25 (J)  H = -70.21 (J)  S = -0.57 (J/K)  V = -232.73 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 950.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = 0.04  COH = 1.58  IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 48.38 (gm) density = 2.45 (gm/cc) viscosity = 6.18 (log 10 poise) (analysis in wt %)
G = -782076.11 (J) H = -631811.47 (J) S = 122.85 (J/K) V = 19.76 (cc) Cp = 64.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.60 | 1.11 | 13.04 | 0.43 | 0.00 | 1.69 | 0.18 | 0.30 | 0.00 | 0.00 | 2.81 | 2.84 | 4.57 | 0.35 | 2.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.68 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.93Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -249286.34 (J) H = -200881.66 (J) S = 39.57 (J/K) V = 5.30 (cc) Cp = 21.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.91 | 94.52 | 94.43 | 4.23 | -3.91 | 6.27 | 0.38 |

clinopyroxene mass = 5.78 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.76Fe"0.44Mg0.56Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -83651.01 (J) H = -68764.39 (J) S = 12.17 (J/K) V = 1.70 (cc) Cp = 6.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.11 | 17.55 | 43.96 | 8.35 | -0.88 | 7.72 | 6.20 |

feldspar mass = 25.75 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.06Na0.66Ca0.28Al1.28Si2.72O8
G = -424941.30 (J) H = -352764.10 (J) S = 59.01 (J/K) V = 9.85 (cc) Cp = 31.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.60 | 28.08 | 6.32 |

quartz mass = 0.94 (gm) density = 2.56 (gm/cc)
SiO2
G = -15553.11 (J) H = -13057.16 (J) S = 2.04 (J/K) V = 0.37 (cc) Cp = 1.11 (J/K)

rhm-oxide mass = 0.39 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.18Al0.12Ti0.85O3
G = -3904.99 (J) H = -2977.06 (J) S = 0.76 (J/K) V = 0.08 (cc) Cp = 0.37 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.27 | 9.11 | 71.17 | 2.64 | 5.80 |

Total solids mass = 51.54 (gm) density = 2.98 (gm/cc)
G = -777336.75 (J) H = -638444.36 (J) S = 113.55 (J/K) V = 17.30 (cc) Cp = 60.71 (J/K)

Viscosity of the System: 8.53 (log 10 poise)

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1559412.86 (J) H = -1270255.83 (J) S = 236.40 (J/K) V = 37.06 (cc) Cp = 125.21 (J/K)

Oxygen delta moles = -0.00230541 delta grams = -0.0737703
G = 636.36 (J) H = -70.49 (J) S = -0.58 (J/K) V = -234.45 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 940.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.03 COH = 1.56 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 45.65 (gm) density = 2.44 (gm/cc) viscosity = 6.19 (log 10 poise) (analysis in wt %)
G = -737605.68 (J) H = -597154.95 (J) S = 115.77 (J/K) V = 18.68 (cc) Cp = 60.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.57 | 1.05 | 13.12 | 0.40 | 0.00 | 1.56 | 0.18 | 0.28 | 0.00 | 0.00 | 2.72 | 2.77 | 4.77 | 0.38 | 2.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.67 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.93Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -248396.65 (J) H = -200650.33 (J) S = 39.36 (J/K) V = 5.29 (cc) Cp = 21.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.72 | 94.69 | 95.09 | 4.26 | -3.95 | 6.26 | 0.37 |

clinopyroxene mass = 6.15 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.44Mg0.56Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -88961.79 (J) H = -73323.59 (J) S = 12.89 (J/K) V = 1.81 (cc) Cp = 6.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.09 | 16.84 | 43.55 | 8.46 | -0.84 | 7.59 | 6.32 |

feldspar mass = 27.08 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.66Ca0.28Al1.28Si2.72O8
G = -446120.90 (J) H = -371152.03 (J) S = 61.80 (J/K) V = 10.36 (cc) Cp = 32.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.71 | 27.52 | 6.77 |

quartz mass = 1.87 (gm) density = 2.56 (gm/cc)
SiO2
G = -30915.65 (J) H = -26010.46 (J) S = 4.04 (J/K) V = 0.73 (cc) Cp = 2.21 (J/K)

rhm-oxide mass = 0.50 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'"0.18Al0.11Ti0.85O3
G = -5038.21 (J) H = -3853.04 (J) S = 0.98 (J/K) V = 0.11 (cc) Cp = 0.48 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.13 | 8.99 | 71.40 | 2.77 | 5.72 |

Total solids mass = 54.27 (gm) density = 2.97 (gm/cc)
G = -819433.21 (J) H = -674989.45 (J) S = 119.07 (J/K) V = 18.30 (cc) Cp = 63.87 (J/K)

Viscosity of the System: 10.16 (log 10 poise)

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1557038.89 (J) H = -1272144.40 (J) S = 234.84 (J/K) V = 36.98 (cc) Cp = 124.72 (J/K)

Oxygen delta moles = -0.0023386 delta grams = -0.0748325
G = 639.67 (J) H = -70.67 (J) S = -0.59 (J/K) V = -235.88 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 930.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.02 COH = 1.53 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 43.16 (gm) density = 2.44 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -697003.33 (J) H = -565474.86 (J) S = 109.32 (J/K) V = 17.70 (cc) Cp = 57.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.52 | 0.99 | 13.21 | 0.37 | 0.00 | 1.44 | 0.19 | 0.26 | 0.00 | 0.00 | 2.64 | 2.70 | 4.95 | 0.40 | 2.33 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.66 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.92Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -247533.60 (J) H = -200442.25 (J) S = 39.14 (J/K) V = 5.28 (cc) Cp = 21.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.48 | 94.86 | 95.71 | 4.30 | -4.00 | 6.25 | 0.37 |

clinopyroxene mass = 6.48 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.43Mg0.55Fe'"0.07Ti0.04Al0.22Si1.85O6
G = -93740.90 (J) H = -77466.76 (J) S = 13.53 (J/K) V = 1.91 (cc) Cp = 7.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.06 | 16.16 | 43.13 | 8.57 | -0.81 | 7.46 | 6.43 |

feldspar mass = 28.30 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.66Ca0.27Al1.27Si2.73O8
G = -465504.09 (J) H = -388119.92 (J) S = 64.32 (J/K) V = 10.83 (cc) Cp = 34.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.80 | 26.98 | 7.23 |

quartz mass = 2.72 (gm) density = 2.56 (gm/cc)
SiO2
G = -44890.98 (J) H = -37849.89 (J) S = 5.85 (J/K) V = 1.06 (cc) Cp = 3.21 (J/K)

rhm-oxide mass = 0.60 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.18Al0.11Ti0.86O3
G = -6007.24 (J) H = -4608.58 (J) S = 1.16 (J/K) V = 0.13 (cc) Cp = 0.57 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.00 | 8.85 | 71.62 | 2.89 | 5.64 |

Total solids mass = 56.77 (gm) density = 2.95 (gm/cc)
G = -857676.81 (J) H = -708487.40 (J) S = 124.00 (J/K) V = 19.21 (cc) Cp = 66.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.71 (gm/cc)
G = -1554680.14 (J) H = -1273962.25 (J) S = 233.32 (J/K) V = 36.91 (cc) Cp = 124.28 (J/K)

Oxygen delta moles = -0.00237223 delta grams = -0.0759085
G = 642.93 (J) H = -70.84 (J) S = -0.59 (J/K) V = -237.30 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 920.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.02 COH = 1.50 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 40.87 (gm) density = 2.43 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -659714.48 (J) H = -536340.97 (J) S = 103.40 (J/K) V = 16.79 (cc) Cp = 54.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.44 | 0.93 | 13.30 | 0.35 | 0.00 | 1.33 | 0.20 | 0.24 | 0.00 | 0.00 | 2.57 | 2.62 | 5.14 | 0.42 | 2.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.65 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.92Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -246693.66 (J) H = -200253.94 (J) S = 38.92 (J/K) V = 5.27 (cc) Cp = 21.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.20 | 95.03 | 96.28 | 4.34 | -4.06 | 6.25 | 0.36 |

clinopyroxene mass = 6.79 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.78Fe"0.43Mg0.55Fe'"0.07Ti0.04Al0.23Si1.85O6
G = -98068.47 (J) H = -81256.73 (J) S = 14.09 (J/K) V = 2.00 (cc) Cp = 7.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.01 | 15.51 | 42.69 | 8.71 | -0.79 | 7.33 | 6.53 |

feldspar mass = 29.44 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.26Al1.26Si2.74O8
G = -483341.77 (J) H = -403867.68 (J) S = 66.61 (J/K) V = 11.27 (cc) Cp = 35.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.84 | 26.45 | 7.70 |

quartz mass = 3.50 (gm) density = 2.56 (gm/cc)
SiO2
G = -57679.60 (J) H = -48737.28 (J) S = 7.49 (J/K) V = 1.37 (cc) Cp = 4.13 (J/K)

rhm-oxide mass = 0.69 (gm) density = 4.61 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.17Al0.11Ti0.86O3
G = -6838.31 (J) H = -5262.73 (J) S = 1.32 (J/K) V = 0.15 (cc) Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.87 | 8.71 | 71.85 | 3.01 | 5.56 |

Total solids mass = 59.06 (gm) density = 2.95 (gm/cc)
G = -892621.82 (J) H = -739378.36 (J) S = 128.44 (J/K) V = 20.05 (cc) Cp = 69.37 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.71 (gm/cc)
G = -1552336.29 (J) H = -1275719.32 (J) S = 231.84 (J/K) V = 36.84 (cc) Cp = 123.87 (J/K)

Oxygen delta moles = -0.00240608 delta grams = -0.0769918
G = 646.09 (J) H = -70.99 (J) S = -0.60 (J/K) V = -238.69 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 910.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.01 COH = 1.48 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 38.76 (gm) density = 2.43 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -625276.38 (J) H = -509393.91 (J) S = 97.94 (J/K) V = 15.95 (cc) Cp = 51.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.35 | 0.88 | 13.39 | 0.32 | 0.00 | 1.22 | 0.20 | 0.23 | 0.00 | 0.00 | 2.50 | 2.55 | 5.31 | 0.44 | 2.60 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.63 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.92Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -245876.21 (J) H = -200084.37 (J) S = 38.70 (J/K) V = 5.26 (cc) Cp = 21.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.89 | 95.20 | 96.81 | 4.39 | -4.12 | 6.25 | 0.36 |

clinopyroxene mass = 7.06 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.78Fe"0.42Mg0.55Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -102009.29 (J) H = -84744.28 (J) S = 14.59 (J/K) V = 2.08 (cc) Cp = 7.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.93 | 14.89 | 42.25 | 8.86 | -0.77 | 7.21 | 6.63 |

feldspar mass = 30.49 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.66Ca0.26Al1.26Si2.74O8
G = -499844.91 (J) H = -418563.56 (J) S = 68.70 (J/K) V = 11.67 (cc) Cp = 37.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.85 | 25.95 | 8.20 |

quartz mass = 4.22 (gm) density = 2.56 (gm/cc)
SiO2
G = -69447.89 (J) H = -58807.00 (J) S = 8.99 (J/K) V = 1.65 (cc) Cp = 4.97 (J/K)

rhm-oxide mass = 0.76 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.17Al0.11Ti0.86O3
G = -7552.41 (J) H = -5830.70 (J) S = 1.46 (J/K) V = 0.16 (cc) Cp = 0.72 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.75 | 8.57 | 72.07 | 3.12 | 5.49 |

Total solids mass = 61.17 (gm) density = 2.94 (gm/cc)
G = -924730.71 (J) H = -768029.91 (J) S = 132.44 (J/K) V = 20.82 (cc) Cp = 71.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.72 (gm/cc)
G = -1550007.09 (J) H = -1277423.83 (J) S = 230.39 (J/K) V = 36.77 (cc) Cp = 123.48 (J/K)

Oxygen delta moles = -0.00244002 delta grams = -0.0780777
G = 649.11 (J) H = -71.12 (J) S = -0.61 (J/K) V = -240.03 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 36.79 (gm) density = 2.43 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -593298.72 (J) H = -484330.12 (J) S = 92.89 (J/K) V = 15.17 (cc) Cp = 49.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.23 | 0.83 | 13.49 | 0.30 | 0.00 | 1.13 | 0.21 | 0.22 | 0.00 | 0.00 | 2.44 | 2.48 | 5.48 | 0.47 | 2.74 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.62 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.91Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -245082.42 (J) H = -199934.09 (J) S = 38.48 (J/K) V = 5.25 (cc) Cp = 21.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.56 | 95.37 | 97.32 | 4.45 | -4.18 | 6.26 | 0.35 |

clinopyroxene mass = 7.31 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.79Fe"0.42Mg0.55Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -105616.43 (J) H = -87971.02 (J) S = 15.04 (J/K) V = 2.15 (cc) Cp = 8.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.84 | 14.29 | 41.79 | 9.02 | -0.77 | 7.09 | 6.73 |

feldspar mass = 31.48 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -515192.99 (J) H = -432350.87 (J) S = 70.62 (J/K) V = 12.05 (cc) Cp = 38.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.83 | 25.46 | 8.71 |

quartz mass = 4.89 (gm) density = 2.56 (gm/cc)
SiO2
G = -80335.36 (J) H = -68171.85 (J) S = 10.37 (J/K) V = 1.91 (cc) Cp = 5.75 (J/K)

rhm-oxide mass = 0.82 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.17Al0.11Ti0.86O3
G = -8166.37 (J) H = -6324.68 (J) S = 1.57 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.63 | 8.42 | 72.29 | 3.23 | 5.43 |

Total solids mass = 63.13 (gm) density = 2.93 (gm/cc)
G = -954393.57 (J) H = -794752.52 (J) S = 136.08 (J/K) V = 21.55 (cc) Cp = 74.02 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.72 (gm/cc)
G = -1547692.29 (J) H = -1279082.64 (J) S = 228.96 (J/K) V = 36.71 (cc) Cp = 123.12 (J/K)

Oxygen delta moles = -0.00247392 delta grams = -0.0791626
G = 651.96 (J) H = -71.23 (J) S = -0.62 (J/K) V = -241.30 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 890.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.01 COH = 1.42 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 34.96 (gm) density = 2.42 (gm/cc) viscosity = 6.23 (log 10 poise) (analysis in wt %)
G = -563448.66 (J) H = -460890.24 (J) S = 88.17 (J/K) V = 14.44 (cc) Cp = 46.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.10 | 0.78 | 13.59 | 0.28 | 0.00 | 1.04 | 0.22 | 0.20 | 0.00 | 0.00 | 2.38 | 2.40 | 5.64 | 0.49 | 2.88 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.61 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.91Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -244314.62 (J) H = -199804.68 (J) S = 38.27 (J/K) V = 5.24 (cc) Cp = 21.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.20 | 95.54 | 97.79 | 4.51 | -4.26 | 6.27 | 0.34 |

clinopyroxene mass = 7.55 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.79Fe"0.41Mg0.54Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -108933.95 (J) H = -90971.48 (J) S = 15.44 (J/K) V = 2.22 (cc) Cp = 8.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.73 | 13.72 | 41.32 | 9.21 | -0.77 | 6.97 | 6.83 |

feldspar mass = 32.41 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -529540.41 (J) H = -445353.10 (J) S = 72.38 (J/K) V = 12.41 (cc) Cp = 39.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.76 | 24.99 | 9.25 |

quartz mass = 5.51 (gm) density = 2.56 (gm/cc)
SiO2
G = -90460.29 (J) H = -76927.59 (J) S = 11.63 (J/K) V = 2.16 (cc) Cp = 6.48 (J/K)

rhm-oxide mass = 0.88 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.11Fe'"0.17Al0.11Ti0.86O3
G = -8693.77 (J) H = -6754.50 (J) S = 1.67 (J/K) V = 0.19 (cc) Cp = 0.83 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.51 | 8.28 | 72.50 | 3.34 | 5.37 |

Total solids mass = 64.96 (gm) density = 2.92 (gm/cc)
G = -981943.04 (J) H = -819811.34 (J) S = 139.39 (J/K) V = 22.22 (cc) Cp = 76.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.73 (gm/cc)
G = -1545391.70 (J) H = -1280701.58 (J) S = 227.56 (J/K) V = 36.66 (cc) Cp = 122.78 (J/K)

Oxygen delta moles = -0.00250772 delta grams = -0.080244
G = 654.62 (J) H = -71.32 (J) S = -0.62 (J/K) V = -242.52 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 880.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.02 COH = 1.39 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 33.24 (gm) density = 2.42 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -535322.55 (J) H = -438753.09 (J) S = 83.74 (J/K) V = 13.74 (cc) Cp = 44.39 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.95 | 0.73 | 13.70 | 0.26 | 0.00 | 0.96 | 0.23 | 0.19 | 0.00 | 0.00 | 2.33 | 2.33 | 5.79 | 0.51 | 3.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.60 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.98Mg0.91Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -243583.25 (J) H = -199704.51 (J) S = 38.05 (J/K) V = 5.24 (cc) Cp = 21.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.83 | 95.71 | 98.24 | 4.58 | -4.34 | 6.30 | 0.34 |

clinopyroxene mass = 7.76 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.41Mg0.54Fe'"0.06Ti0.04Al0.23Si1.85O6
G = -111984.91 (J) H = -93763.01 (J) S = 15.80 (J/K) V = 2.28 (cc) Cp = 8.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.59 | 13.16 | 40.83 | 9.41 | -0.77 | 6.85 | 6.93 |

feldspar mass = 33.29 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.66Ca0.25Al1.25Si2.75O8
G = -543045.14 (J) H = -457697.76 (J) S = 74.01 (J/K) V = 12.75 (cc) Cp = 40.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.66 | 24.53 | 9.81 |

quartz mass = 6.10 (gm) density = 2.56 (gm/cc)
SiO2
G = -99948.34 (J) H = -85177.11 (J) S = 12.81 (J/K) V = 2.38 (cc) Cp = 7.16 (J/K)

rhm-oxide mass = 0.93 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.73Mg0.10Fe'"0.16Al0.11Ti0.87O3
G = -9147.51 (J) H = -7129.58 (J) S = 1.75 (J/K) V = 0.20 (cc) Cp = 0.87 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.39 | 8.12 | 72.72 | 3.44 | 5.32 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -73.39 (J) H = -61.20 (J) S = 0.01 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 66.68 (gm) density = 2.92 (gm/cc)
G = -1007782.54 (J) H = -843533.17 (J) S = 142.44 (J/K) V = 22.86 (cc) Cp = 78.06 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.73 (gm/cc)
G = -1543105.09 (J) H = -1282286.27 (J) S = 226.18 (J/K) V = 36.60 (cc) Cp = 122.45 (J/K)

Oxygen delta moles = -0.00254144 delta grams = -0.0813231
G = 657.10 (J) H = -71.37 (J) S = -0.63 (J/K) V = -243.66 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 870.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.45  delta HM = -5.07  NNO = 0.00  QFM = -0.03  COH = 1.36
IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid  mass = 31.59 (gm)  density = 2.41 (gm/cc)  viscosity = 6.22 (log 10 poise)  (analysis in wt %)
G = -508522.23 (J)  H = -417598.49 (J)  S = 79.54 (J/K)  V = 13.08 (cc)  Cp = 42.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.81 | 0.69 | 13.81 | 0.24 | 0.00 | 0.88 | 0.23 | 0.18 | 0.00 | 0.00 | 2.26 | 2.25 | 5.93 | 0.51 | 3.19 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.59 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.90Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -242901.74 (J)  H = -199644.62 (J)  S = 37.84 (J/K)  V = 5.23 (cc)  Cp = 21.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.44 | 95.88 | 98.67 | 4.66 | -4.43 | 6.33 | 0.33 |

clinopyroxene  mass = 7.95 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.40Mg0.54Fe'"0.06Ti0.04Al0.23Si1.84O6
G = -114780.97 (J)  H = -96353.62 (J)  S = 16.12 (J/K)  V = 2.34 (cc)  Cp = 8.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.43 | 12.62 | 40.34 | 9.64 | -0.78 | 6.74 | 7.02 |

feldspar  mass = 34.14 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.10Na0.66Ca0.24Al1.24Si2.76O8
G = -555855.26 (J)  H = -469505.07 (J)  S = 75.54 (J/K)  V = 13.08 (cc)  Cp = 41.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.52 | 24.08 | 10.40 |

quartz  mass = 6.65 (gm)  density = 2.56 (gm/cc)
SiO2
G = -108914.07 (J)  H = -93014.76 (J)  S = 13.91 (J/K)  V = 2.60 (cc)  Cp = 7.81 (J/K)

rhm-oxide  mass = 0.97 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.16Al0.11Ti0.87O3
G = -9538.59 (J)  H = -7457.97 (J)  S = 1.82 (J/K)  V = 0.21 (cc)  Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.28 | 7.97 | 72.93 | 3.54 | 5.28 |

apatite  mass = 0.02 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -319.42 (J)  H = -266.98 (J)  S = 0.05 (J/K)  V = 0.01 (cc)  Cp = 0.02 (J/K)

Total solids  mass = 68.32 (gm)  density = 2.91 (gm/cc)
G = -1032310.05 (J)  H = -866243.03 (J)  S = 145.27 (J/K)  V = 23.46 (cc)  Cp = 79.92 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.73 (gm/cc)
G = -1540832.28 (J)  H = -1283841.52 (J)  S = 224.81 (J/K)  V = 36.55 (cc)  Cp = 122.13 (J/K)

Oxygen  delta moles = -0.00257517  delta grams = -0.0824023

G = 659.43 (J)  H = -71.41 (J)  S = -0.64 (J/K)  V = -244.76 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 860.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.64  delta HM = -5.08  NNO = 0.00  QFM = -0.04  COH = 1.33
IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid  mass = 30.03 (gm)  density = 2.41 (gm/cc)  viscosity = 6.21 (log 10 poise)  (analysis in wt %)
G = -483160.87 (J)  H = -397529.88 (J)  S = 75.57 (J/K)  V = 12.46 (cc)  Cp = 40.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.65 | 0.65 | 13.93 | 0.23 | 0.00 | 0.82 | 0.24 | 0.17 | 0.00 | 0.00 | 2.19 | 2.18 | 6.06 | 0.52 | 3.35 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.58 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.99Mg0.90Fe'"0.02Ti0.00Al0.11Si1.93O6
G = -242253.53 (J)  H = -199611.23 (J)  S = 37.63 (J/K)  V = 5.22 (cc)  Cp = 21.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.04 | 96.04 | 99.08 | 4.75 | -4.52 | 6.37 | 0.32 |

clinopyroxene  mass = 8.14 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.40Mg0.54Fe'"0.06Ti0.05Al0.24Si1.84O6
G = -117389.12 (J)  H = -98797.91 (J)  S = 16.41 (J/K)  V = 2.39 (cc)  Cp = 9.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.24 | 12.09 | 39.84 | 9.89 | -0.80 | 6.63 | 7.11 |

feldspar  mass = 34.94 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.11Na0.65Ca0.24Al1.24Si2.76O8
G = -568007.85 (J)  H = -480802.84 (J)  S = 76.96 (J/K)  V = 13.39 (cc)  Cp = 42.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.34 | 23.63 | 11.02 |

quartz  mass = 7.18 (gm)  density = 2.56 (gm/cc)
SiO2
G = -117364.28 (J)  H = -100443.46 (J)  S = 14.93 (J/K)  V = 2.81 (cc)  Cp = 8.42 (J/K)

rhm-oxide  mass = 1.00 (gm)  density = 4.63 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.16Al0.10Ti0.87O3
G = -9868.13 (J)  H = -7740.09 (J)  S = 1.88 (J/K)  V = 0.22 (cc)  Cp = 0.94 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.16 | 7.82 | 73.15 | 3.64 | 5.24 |

apatite  mass = 0.04 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -529.53 (J)  H = -443.64 (J)  S = 0.08 (J/K)  V = 0.01 (cc)  Cp = 0.04 (J/K)

Total solids  mass = 69.88 (gm)  density = 2.91 (gm/cc)
G = -1055412.43 (J)  H = -887839.18 (J)  S = 147.88 (J/K)  V = 24.04 (cc)  Cp = 81.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.74 (gm/cc)
G = -1538573.30 (J) H = -1285369.06 (J) S = 223.45 (J/K) V = 36.50 (cc) Cp = 121.83 (J/K)

Oxygen delta moles = -0.00260857 delta grams = -0.0834712
G = 661.51 (J) H = -71.41 (J) S = -0.65 (J/K) V = -245.76 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 850.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.05 COH = 1.30 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 28.29 (gm) density = 2.41 (gm/cc) viscosity = 6.17 (log 10 poise) (analysis in wt %)
G = -454888.33 (J) H = -374904.75 (J) S = 71.21 (J/K) V = 11.75 (cc) Cp = 37.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.48 | 0.60 | 14.03 | 0.22 | 0.00 | 0.76 | 0.25 | 0.16 | 0.00 | 0.00 | 2.14 | 2.15 | 6.11 | 0.53 | 3.56 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.59 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.99Mg0.90Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -241720.56 (J) H = -199674.12 (J) S = 37.44 (J/K) V = 5.22 (cc) Cp = 21.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.62 | 96.21 | 99.45 | 4.85 | -4.64 | 6.43 | 0.32 |

clinopyroxene mass = 8.29 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.39Mg0.54Fe'"0.06Ti0.05Al0.24Si1.84O6
G = -119633.19 (J) H = -100946.84 (J) S = 16.64 (J/K) V = 2.44 (cc) Cp = 9.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.02 | 11.57 | 39.30 | 10.20 | -0.83 | 6.53 | 7.20 |

feldspar mass = 35.27 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.65Ca0.23Al1.23Si2.77O8
G = -572547.70 (J) H = -485715.03 (J) S = 77.31 (J/K) V = 13.51 (cc) Cp = 42.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.29 | 23.50 | 11.22 |

feldspar mass = 0.65 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.03Al1.03Si2.97O8
G = -10229.22 (J) H = -8655.72 (J) S = 1.40 (J/K) V = 0.26 (cc) Cp = 0.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.14 | 2.89 | 64.98 |

quartz mass = 7.74 (gm) density = 2.56 (gm/cc)
SiO2
G = -126354.76 (J) H = -108365.86 (J) S = 16.02 (J/K) V = 3.03 (cc) Cp = 9.06 (J/K)

rhm-oxide mass = 1.04 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.15Al0.10Ti0.87O3
G = -10199.62 (J) H = -8025.57 (J) S = 1.94 (J/K) V = 0.22 (cc) Cp = 0.97 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.05 | 7.66 | 73.36 | 3.73 | 5.21 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -755.15 (J) H = -634.15 (J) S = 0.11 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 71.63 (gm) density = 2.90 (gm/cc)
G = -1081440.18 (J) H = -912017.30 (J) S = 150.85 (J/K) V = 24.69 (cc) Cp = 83.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.74 (gm/cc)
G = -1536328.51 (J) H = -1286922.05 (J) S = 222.06 (J/K) V = 36.44 (cc) Cp = 121.50 (J/K)

Oxygen delta moles = -0.00264093 delta grams = -0.0845066
G = 663.17 (J) H = -71.36 (J) S = -0.65 (J/K) V = -246.62 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 840.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.06 COH = 1.27 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 25.88 (gm) density = 2.40 (gm/cc) viscosity = 6.02 (log 10 poise) (analysis in wt %)
G = -416300.43 (J) H = -343413.61 (J) S = 65.48 (J/K) V = 10.79 (cc) Cp = 34.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.47 | 0.54 | 13.81 | 0.21 | 0.00 | 0.71 | 0.27 | 0.16 | 0.00 | 0.00 | 2.10 | 2.35 | 5.95 | 0.54 | 3.89 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.37 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.59Mg0.24)3Al2Si3O12
G = -31962.85 (J) H = -26847.29 (J) S = 4.60 (J/K) V = 0.60 (cc) Cp = 2.56 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.56 | 17.79 | 23.66 |

orthopyroxene mass = 16.92 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.98Mg0.92Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -220677.94 (J) H = -182896.45 (J) S = 33.94 (J/K) V = 4.76 (cc) Cp = 19.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.60 | 96.27 | 97.74 | 4.65 | -4.45 | 6.07 | 0.32 |

clinopyroxene mass = 8.54 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.82Fe"0.38Mg0.55Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -123572.14 (J) H = -104585.49 (J) S = 17.06 (J/K) V = 2.51 (cc) Cp = 9.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.47 | 11.04 | 37.69 | 10.05 | -0.66 | 6.01 | 7.41 |

feldspar mass = 33.64 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.66Ca0.22Al1.22Si2.78O8
G = -545215.66 (J) H = -463505.01 (J) S = 73.40 (J/K) V = 12.89 (cc) Cp = 40.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.42 | 22.40 | 11.18 |

feldspar mass = 2.65 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.03Al1.03Si2.97O8
G = -41753.58 (J) H = -35409.98 (J) S = 5.70 (J/K) V = 1.04 (cc) Cp = 3.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.34 | 2.70 | 64.97 |

quartz mass = 8.76 (gm) density = 2.56 (gm/cc)
SiO2
G = -142842.12 (J) H = -122763.57 (J) S = 18.04 (J/K) V = 3.43 (cc) Cp = 10.25 (J/K)

rhm-oxide mass = 1.09 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.10Fe'"0.15Al0.10Ti0.88O3
G = -10662.77 (J) H = -8419.62 (J) S = 2.02 (J/K) V = 0.23 (cc) Cp = 1.01 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.31 | 7.35 | 73.41 | 3.87 | 5.05 |

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1075.15 (J) H = -905.00 (J) S = 0.15 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 74.03 (gm) density = 2.90 (gm/cc)
G = -1117762.21 (J) H = -945332.41 (J) S = 154.90 (J/K) V = 25.49 (cc) Cp = 86.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.75 (gm/cc)
G = -1534062.64 (J) H = -1288746.02 (J) S = 220.38 (J/K) V = 36.29 (cc) Cp = 120.97 (J/K)

Oxygen delta moles = -0.00274342 delta grams = -0.087786
G = 682.12 (J) H = -73.16 (J) S = -0.68 (J/K) V = -253.90 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 23.76 (gm) density = 2.39 (gm/cc) viscosity = 5.87 (log 10 poise) (analysis in wt %)
G = -382383.50 (J) H = -315717.33 (J) S = 60.43 (J/K) V = 9.94 (cc) Cp = 31.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.37 | 0.49 | 13.65 | 0.20 | 0.00 | 0.67 | 0.29 | 0.16 | 0.00 | 0.00 | 2.07 | 2.52 | 5.79 | 0.56 | 4.23 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.04 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -54571.58 (J) H = -45948.80 (J) S = 7.82 (J/K) V = 1.03 (cc) Cp = 4.37 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.45 | 17.70 | 23.85 |

orthopyroxene mass = 15.74 (gm) density = 3.55 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.96Mg0.94Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -205670.93 (J) H = -170988.36 (J) S = 31.44 (J/K) V = 4.43 (cc) Cp = 17.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.18 | 96.34 | 96.50 | 4.53 | -4.33 | 5.82 | 0.33 |

clinopyroxene mass = 8.74 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.36Mg0.56Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -126711.80 (J) H = -107551.38 (J) S = 17.37 (J/K) V = 2.58 (cc) Cp = 9.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.47 | 10.55 | 36.35 | 9.99 | -0.54 | 5.59 | 7.59 |

feldspar mass = 32.40 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.67Ca0.22Al1.22Si2.78O8
G = -524466.20 (J) H = -446824.69 (J) S = 70.38 (J/K) V = 12.42 (cc) Cp = 39.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.34 | 21.64 | 11.02 |

feldspar mass = 4.39 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.32Ca0.03Al1.03Si2.97O8
G = -68982.55 (J) H = -58633.26 (J) S = 9.38 (J/K) V = 1.73 (cc) Cp = 5.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.26 | 2.51 | 65.23 |

quartz mass = 9.62 (gm) density = 2.56 (gm/cc)
SiO2
G = -156698.80 (J) H = -134954.85 (J) S = 19.71 (J/K) V = 3.76 (cc) Cp = 11.25 (J/K)

rhm-oxide mass = 1.12 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.10Fe'"0.14Al0.10Ti0.88O3
G = -11018.19 (J) H = -8730.02 (J) S = 2.07 (J/K) V = 0.24 (cc) Cp = 1.04 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.49 | 7.09 | 73.50 | 4.00 | 4.93 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1321.72 (J) H = -1115.15 (J) S = 0.19 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 76.15 (gm) density = 2.90 (gm/cc)
G = -1149441.78 (J) H = -974746.52 (J) S = 158.36 (J/K) V = 26.22 (cc) Cp = 88.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.76 (gm/cc)
G = -1531825.28 (J) H = -1290463.85 (J) S = 218.79 (J/K) V = 36.16 (cc) Cp = 120.53 (J/K)

Oxygen delta moles = -0.00282228 delta grams = -0.0903096
G = 694.75 (J) H = -74.27 (J) S = -0.70 (J/K) V = -258.86 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 820.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.08 COH = 1.21
IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 21.82 (gm) density = 2.38 (gm/cc) viscosity = 5.70 (log 10 poise) (analysis in wt %)
G = -351271.85 (J) H = -290254.57 (J) S = 55.82 (J/K) V = 9.16 (cc) Cp = 29.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.23 | 0.44 | 13.48 | 0.19 | 0.00 | 0.63 | 0.31 | 0.16 | 0.00 | 0.00 | 2.05 | 2.71 | 5.62 | 0.58 | 4.61 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.57 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -75082.70 (J) H = -63371.49 (J) S = 10.71 (J/K) V = 1.41 (cc) Cp = 6.01 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.36 | 17.62 | 24.03 |

orthopyroxene mass = 14.67 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.95Mg0.95Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -192008.93 (J) H = -160119.68 (J) S = 29.17 (J/K) V = 4.14 (cc) Cp = 16.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.82 | 96.43 | 95.30 | 4.40 | -4.21 | 5.57 | 0.33 |

clinopyroxene mass = 8.92 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.35Mg0.57Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -129578.83 (J) H = -110296.44 (J) S = 17.64 (J/K) V = 2.63 (cc) Cp = 9.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.38 | 10.09 | 35.06 | 9.92 | -0.42 | 5.20 | 7.78 |

feldspar mass = 31.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.68Ca0.21Al1.21Si2.79O8
G = -505701.74 (J) H = -431765.36 (J) S = 67.64 (J/K) V = 11.99 (cc) Cp = 37.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.25 | 20.90 | 10.85 |

feldspar mass = 5.96 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -93588.76 (J) H = -79725.96 (J) S = 12.68 (J/K) V = 2.35 (cc) Cp = 7.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.14 | 2.33 | 65.53 |

quartz mass = 10.42 (gm) density = 2.56 (gm/cc)
SiO2
G = -169553.05 (J) H = -146330.61 (J) S = 21.24 (J/K) V = 4.08 (cc) Cp = 12.17 (J/K)

rhm-oxide mass = 1.15 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.11Fe'"0.14Al0.10Ti0.88O3
G = -11304.08 (J) H = -8986.85 (J) S = 2.12 (J/K) V = 0.25 (cc) Cp = 1.07 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.65 | 6.84 | 73.60 | 4.11 | 4.80 |

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1517.31 (J) H = -1283.15 (J) S = 0.21 (J/K) V = 0.03 (cc) Cp = 0.12 (J/K)

Total solids mass = 78.08 (gm) density = 2.90 (gm/cc)

G = -1178335.40 (J)  H = -1001879.55 (J)  S = 161.42 (J/K)  V = 26.88 (cc)  Cp = 90.75 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.91 (gm)  density = 2.77 (gm/cc)
G = -1529607.25 (J)  H = -1292134.12 (J)  S = 217.24 (J/K)  V = 36.05 (cc)  Cp = 120.12 (J/K)

Oxygen  delta moles = -0.00289438  delta grams = -0.0926167
G = 705.35 (J)  H = -75.15 (J)  S = -0.71 (J/K)  V = -263.06 (cc)  Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 810.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.66  delta HM = -5.12  NNO = 0.00  QFM = -0.09  COH = 1.18  IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid  mass = 20.03 (gm)  density = 2.37 (gm/cc)  viscosity = 5.52 (log 10 poise)  (analysis in wt %)
G = -322471.92 (J)  H = -266625.07 (J)  S = 51.56 (J/K)  V = 8.44 (cc)  Cp = 27.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.02 | 0.39 | 13.30 | 0.18 | 0.00 | 0.59 | 0.33 | 0.16 | 0.00 | 0.00 | 2.03 | 2.92 | 5.44 | 0.61 | 5.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 6.96 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -93761.24 (J)  H = -79326.34 (J)  S = 13.33 (J/K)  V = 1.77 (cc)  Cp = 7.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.28 | 17.53 | 24.20 |

orthopyroxene  mass = 13.70 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.97Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -179519.79 (J)  H = -150158.13 (J)  S = 27.11 (J/K)  V = 3.87 (cc)  Cp = 15.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.50 | 96.51 | 94.14 | 4.27 | -4.09 | 5.34 | 0.33 |

clinopyroxene  mass = 9.08 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.82Fe"0.34Mg0.58Fe'"0.05Ti0.05Al0.23Si1.86O6
G = -132212.13 (J)  H = -112851.95 (J)  S = 17.87 (J/K)  V = 2.68 (cc)  Cp = 10.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.21 | 9.65 | 33.81 | 9.84 | -0.29 | 4.81 | 7.97 |

feldspar  mass = 30.27 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.11Na0.69Ca0.20Al1.20Si2.80O8
G = -488735.79 (J)  H = -418178.03 (J)  S = 65.14 (J/K)  V = 11.61 (cc)  Cp = 36.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.14 | 20.19 | 10.67 |

feldspar  mass = 7.40 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -115920.13 (J)  H = -98970.24 (J)  S = 15.65 (J/K)  V = 2.91 (cc)  Cp = 8.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.98 | 2.16 | 65.86 |

quartz mass = 11.18 (gm) density = 2.56 (gm/cc)
SiO2
G = -181587.10 (J) H = -157042.96 (J) S = 22.66 (J/K) V = 4.37 (cc) Cp = 13.04 (J/K)

rhm-oxide mass = 1.18 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.11Fe'"0.13Al0.09Ti0.89O3
G = -11531.87 (J) H = -9198.66 (J) S = 2.15 (J/K) V = 0.25 (cc) Cp = 1.09 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.81 | 6.60 | 73.70 | 4.21 | 4.69 |

apatite mass = 0.11 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1667.83 (J) H = -1413.71 (J) S = 0.23 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 79.88 (gm) density = 2.90 (gm/cc)
G = -1204935.88 (J) H = -1027140.02 (J) S = 164.15 (J/K) V = 27.50 (cc) Cp = 92.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1527407.80 (J) H = -1293765.10 (J) S = 215.71 (J/K) V = 35.94 (cc) Cp = 119.76 (J/K)

Oxygen delta moles = -0.00296056 delta grams = -0.0947343
G = 714.18 (J) H = -75.82 (J) S = -0.73 (J/K) V = -266.62 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 18.33 (gm) density = 2.36 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -295229.64 (J) H = -244192.82 (J) S = 47.56 (J/K) V = 7.76 (cc) Cp = 24.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.74 | 0.35 | 13.08 | 0.18 | 0.00 | 0.57 | 0.37 | 0.16 | 0.00 | 0.00 | 2.03 | 3.16 | 5.23 | 0.65 | 5.48 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.01 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.24)3Al2Si3O12
G = -107625.11 (J) H = -91268.41 (J) S = 15.24 (J/K) V = 2.03 (cc) Cp = 8.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.34 | 17.45 | 24.21 |

orthopyroxene mass = 13.17 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.98Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -172683.43 (J) H = -144849.96 (J) S = 25.94 (J/K) V = 3.72 (cc) Cp = 14.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.69 | 96.60 | 93.44 | 4.15 | -3.98 | 5.14 | 0.33 |

clinopyroxene mass = 8.64 (gm) density = 3.38 (gm/cc) (analysis in mole %)

cpx Na0.08Ca0.83Fe"0.33Mg0.59Fe'"0.04Ti0.05Al0.22Si1.86O6
G = -125898.86 (J) H = -107748.25 (J) S = 16.91 (J/K) V = 2.56 (cc) Cp = 9.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.72 | 9.27 | 32.86 | 9.66 | -0.16 | 4.46 | 8.17 |

clinopyroxene mass = 0.66 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.27Mg0.33Fe'"0.05Ti0.39Al0.73Si1.26O6
G = -9572.92 (J) H = -8224.45 (J) S = 1.26 (J/K) V = 0.19 (cc) Cp = 0.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.84 | 1.93 | 26.59 | 69.40 | 8.61 | -4.11 | 7.42 |

feldspar mass = 29.27 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.70Ca0.19Al1.19Si2.81O8
G = -472056.84 (J) H = -404772.36 (J) S = 62.70 (J/K) V = 11.23 (cc) Cp = 35.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.07 | 19.42 | 10.51 |

feldspar mass = 8.75 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -136850.48 (J) H = -117100.63 (J) S = 18.40 (J/K) V = 3.44 (cc) Cp = 10.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.85 | 1.99 | 66.16 |

quartz mass = 11.92 (gm) density = 2.56 (gm/cc)
SiO2
G = -193343.93 (J) H = -167557.93 (J) S = 24.03 (J/K) V = 4.66 (cc) Cp = 13.88 (J/K)

rhm-oxide mass = 1.04 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.74Mg0.11Fe'"0.13Al0.09Ti0.89O3
G = -10177.32 (J) H = -8144.09 (J) S = 1.89 (J/K) V = 0.22 (cc) Cp = 0.96 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.88 | 6.41 | 73.74 | 4.41 | 4.56 |

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1778.22 (J) H = -1510.78 (J) S = 0.25 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 81.57 (gm) density = 2.90 (gm/cc)
G = -1229987.11 (J) H = -1051176.85 (J) S = 166.62 (J/K) V = 28.09 (cc) Cp = 94.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.79 (gm/cc)
G = -1525216.75 (J) H = -1295369.67 (J) S = 214.18 (J/K) V = 35.85 (cc) Cp = 119.43 (J/K)

Oxygen delta moles = -0.00303989 delta grams = -0.0972727
G = 725.83 (J) H = -76.79 (J) S = -0.75 (J/K) V = -271.23 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 790.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.11 COH = 1.11
IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 16.70 (gm) density = 2.35 (gm/cc) viscosity = 5.04 (log 10 poise) (analysis in wt %)
G = -269128.12 (J) H = -222611.99 (J) S = 43.75 (J/K) V = 7.10 (cc) Cp = 22.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.35 | 0.30 | 12.82 | 0.18 | 0.00 | 0.55 | 0.44 | 0.15 | 0.00 | 0.00 | 2.05 | 3.45 | 4.98 | 0.70 | 6.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.66 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -116150.99 (J) H = -98721.32 (J) S = 16.39 (J/K) V = 2.20 (cc) Cp = 9.30 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.57 | 17.38 | 24.05 |

orthopyroxene mass = 13.15 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -172179.64 (J) H = -144805.98 (J) S = 25.75 (J/K) V = 3.71 (cc) Cp = 14.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.47 | 96.71 | 93.31 | 4.03 | -3.87 | 4.95 | 0.34 |

clinopyroxene mass = 7.51 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.32Mg0.59Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -109537.06 (J) H = -93980.02 (J) S = 14.63 (J/K) V = 2.22 (cc) Cp = 8.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.88 | 8.96 | 32.25 | 9.35 | -0.01 | 4.16 | 8.41 |

clinopyroxene mass = 2.07 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.26Mg0.33Fe'"0.04Ti0.39Al0.73Si1.26O6
G = -30045.07 (J) H = -25873.19 (J) S = 3.92 (J/K) V = 0.58 (cc) Cp = 2.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.89 | 1.84 | 26.35 | 69.73 | 8.81 | -4.51 | 7.67 |

feldspar mass = 28.28 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -455377.07 (J) H = -391302.47 (J) S = 60.27 (J/K) V = 10.85 (cc) Cp = 34.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.05 | 18.58 | 10.37 |

feldspar mass = 10.03 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -156731.19 (J) H = -134410.33 (J) S = 21.00 (J/K) V = 3.95 (cc) Cp = 11.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.75 | 1.83 | 66.42 |

quartz mass = 12.65 (gm) density = 2.56 (gm/cc)
SiO2
G = -205031.12 (J) H = -178054.22 (J) S = 25.37 (J/K) V = 4.95 (cc) Cp = 14.72 (J/K)

rhm-oxide mass = 0.72 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.11Fe'"0.13Al0.09Ti0.89O3
G = -7004.17 (J) H = -5621.73 (J) S = 1.30 (J/K) V = 0.15 (cc) Cp = 0.66 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.86 | 6.29 | 73.67 | 4.76 | 4.42 |

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1847.82 (J) H = -1573.53 (J) S = 0.26 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 83.20 (gm) density = 2.90 (gm/cc)
G = -1253904.13 (J) H = -1074342.79 (J) S = 168.90 (J/K) V = 28.65 (cc) Cp = 96.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.79 (gm/cc)
G = -1523032.24 (J) H = -1296954.78 (J) S = 212.65 (J/K) V = 35.76 (cc) Cp = 119.15 (J/K)

Oxygen delta moles = -0.00313609 delta grams = -0.100351
G = 741.10 (J) H = -78.12 (J) S = -0.77 (J/K) V = -277.21 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 780.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.12 COH = 1.07 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 15.15 (gm) density = 2.34 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -244187.09 (J) H = -201921.59 (J) S = 40.13 (J/K) V = 6.47 (cc) Cp = 20.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.83 | 0.26 | 12.53 | 0.18 | 0.00 | 0.54 | 0.53 | 0.15 | 0.00 | 0.00 | 2.08 | 3.78 | 4.71 | 0.77 | 6.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.24 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.59Mg0.24)3Al2Si3O12
G = -123678.38 (J) H = -105356.07 (J) S = 17.40 (J/K) V = 2.34 (cc) Cp = 9.91 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.81 | 17.32 | 23.87 |

orthopyroxene mass = 13.13 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -171828.93 (J) H = -144887.78 (J) S = 25.58 (J/K) V = 3.71 (cc) Cp = 14.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.28 | 96.82 | 93.19 | 3.91 | -3.76 | 4.78 | 0.34 |

clinopyroxene mass = 6.49 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.32Mg0.60Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -94716.96 (J) H = -81466.85 (J) S = 12.58 (J/K) V = 1.92 (cc) Cp = 7.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.02 | 8.65 | 31.64 | 9.04 | 0.13 | 3.87 | 8.65 |

clinopyroxene mass = 3.37 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.26Mg0.33Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -48775.50 (J) H = -42100.37 (J) S = 6.34 (J/K) V = 0.94 (cc) Cp = 3.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.93 | 1.74 | 26.12 | 70.04 | 9.01 | -4.91 | 7.92 |

feldspar mass = 27.38 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.72Ca0.18Al1.18Si2.82O8
G = -440429.08 (J) H = -379265.55 (J) S = 58.08 (J/K) V = 10.51 (cc) Cp = 33.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.01 | 17.77 | 10.22 |

feldspar mass = 11.22 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -175028.43 (J) H = -150434.94 (J) S = 23.35 (J/K) V = 4.41 (cc) Cp = 13.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.59 | 1.68 | 66.73 |

quartz mass = 13.36 (gm) density = 2.56 (gm/cc)
SiO2
G = -216312.22 (J) H = -188238.56 (J) S = 26.66 (J/K) V = 5.23 (cc) Cp = 15.53 (J/K)

rhm-oxide mass = 0.41 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.11Fe'"0.12Al0.09Ti0.90O3
G = -4036.97 (J) H = -3249.88 (J) S = 0.75 (J/K) V = 0.09 (cc) Cp = 0.38 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.83 | 6.17 | 73.61 | 5.11 | 4.28 |

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1873.01 (J) H = -1598.65 (J) S = 0.26 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 84.75 (gm) density = 2.90 (gm/cc)
G = -1276679.47 (J) H = -1096598.66 (J) S = 170.99 (J/K) V = 29.20 (cc) Cp = 98.24 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.80 (gm/cc)
G = -1520866.56 (J) H = -1298520.25 (J) S = 211.13 (J/K) V = 35.67 (cc) Cp = 118.92 (J/K)

Oxygen delta moles = -0.00322562 delta grams = -0.103216
G = 754.33 (J) H = -79.21 (J) S = -0.79 (J/K) V = -282.44 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 770.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.14 COH = 1.04 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 12.65 (gm) density = 2.33 (gm/cc) viscosity = 4.42 (log 10 poise) (analysis in wt %)
G = -204030.59 (J) H = -168582.36 (J) S = 33.98 (J/K) V = 5.44 (cc) Cp = 17.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.26 | 0.21 | 12.14 | 0.19 | 0.00 | 0.55 | 0.51 | 0.14 | 0.00 | 0.00 | 2.13 | 4.24 | 4.40 | 0.85 | 7.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.35 (gm) density = 3.95 (gm/cc) (analysis in mole %)

(Ca0.17Fe"0.59Mg0.23)3Al2Si3O12
G = -164678.44 (J) H = -140577.88 (J) S = 23.10 (J/K) V = 3.13 (cc) Cp = 13.22 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.41 | 17.28 | 23.31 |

orthopyroxene mass = 8.68 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.98Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -113092.76 (J) H = -95568.35 (J) S = 16.80 (J/K) V = 2.45 (cc) Cp = 9.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.39 | 96.97 | 94.30 | 3.80 | -3.67 | 4.65 | 0.34 |

clinopyroxene mass = 9.46 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.32Mg0.60Fe'"0.04Ti0.05Al0.21Si1.87O6
G = -137775.34 (J) H = -118763.59 (J) S = 18.23 (J/K) V = 2.80 (cc) Cp = 10.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.31 | 8.38 | 31.69 | 8.69 | 0.40 | 3.56 | 8.96 |

clinopyroxene mass = 0.27 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.26Mg0.33Fe'"0.04Ti0.40Al0.73Si1.26O6
G = -3969.08 (J) H = -3433.17 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.28 | 1.65 | 26.33 | 70.02 | 9.34 | -5.34 | 8.26 |

biotite mass = 1.65 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -26126.95 (J) H = -22388.08 (J) S = 3.58 (J/K) V = 0.60 (cc) Cp = 2.08 (J/K)

| annite | phlogopite |
|---|---|
| 4.37 | 95.63 |

feldspar mass = 27.45 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.17Al1.17Si2.83O8
G = -440915.24 (J) H = -380486.50 (J) S = 57.93 (J/K) V = 10.54 (cc) Cp = 33.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.08 | 16.79 | 10.13 |

feldspar mass = 10.97 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -170934.95 (J) H = -147241.40 (J) S = 22.71 (J/K) V = 4.32 (cc) Cp = 12.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.56 | 1.52 | 66.92 |

quartz mass = 15.06 (gm) density = 2.56 (gm/cc)
SiO2
G = -243450.24 (J) H = -212290.11 (J) S = 29.87 (J/K) V = 5.89 (cc) Cp = 17.48 (J/K)

rhm-oxide mass = 1.20 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.10Fe'"0.12Al0.08Ti0.90O3
G = -11648.19 (J) H = -9402.84 (J) S = 2.15 (J/K) V = 0.26 (cc) Cp = 1.10 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.50 | 6.08 | 74.74 | 4.60 | 4.08 |

apatite mass = 0.15 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2187.89 (J) H = -1871.69 (J) S = 0.30 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

Total solids mass = 87.25 (gm) density = 2.90 (gm/cc)
G = -1314779.07 (J) H = -1132023.60 (J) S = 175.20 (J/K) V = 30.10 (cc) Cp = 101.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.81 (gm/cc)
G = -1518809.66 (J) H = -1300605.97 (J) S = 209.18 (J/K) V = 35.54 (cc) Cp = 118.45 (J/K)

Oxygen delta moles = -0.0031368 delta grams = -0.100374
G = 725.87 (J) H = -75.93 (J) S = -0.77 (J/K) V = -272.06 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 10.09 (gm) density = 2.31 (gm/cc) viscosity = 3.95 (log 10 poise) (analysis in wt %)
G = -162887.00 (J) H = -134293.57 (J) S = 27.68 (J/K) V = 4.38 (cc) Cp = 13.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.40 | 0.16 | 11.41 | 0.22 | 0.00 | 0.61 | 0.61 | 0.12 | 0.00 | 0.00 | 2.22 | 4.97 | 3.94 | 0.96 | 8.38 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.41 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.61Mg0.22)3Al2Si3O12
G = -190707.43 (J) H = -163077.06 (J) S = 26.74 (J/K) V = 3.63 (cc) Cp = 15.35 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.07 | 17.36 | 21.58 |

orthopyroxene mass = 5.47 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.99Mg0.93Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -70353.64 (J) H = -59506.68 (J) S = 10.50 (J/K) V = 1.53 (cc) Cp = 6.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.35 | 97.21 | 99.07 | 3.71 | -3.59 | 4.63 | 0.33 |

clinopyroxene mass = 9.94 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.82Fe"0.34Mg0.57Fe'"0.04Ti0.04Al0.21Si1.88O6
G = -143699.40 (J) H = -124040.34 (J) S = 19.03 (J/K) V = 2.94 (cc) Cp = 10.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.28 | 8.39 | 33.97 | 7.65 | 0.82 | 3.43 | 9.47 |

biotite mass = 3.72 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -58445.77 (J) H = -50168.31 (J) S = 8.01 (J/K) V = 1.34 (cc) Cp = 4.67 (J/K)

| annite | phlogopite |
|---|---|
| 5.53 | 94.47 |

feldspar mass = 27.43 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.74Ca0.15Al1.15Si2.85O8
G = -439952.80 (J) H = -380436.71 (J) S = 57.61 (J/K) V = 10.54 (cc) Cp = 33.60 (J/K)

albite anorthite sanidine
74.48 15.27 10.25

feldspar mass = 10.34 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -160806.08 (J) H = -138820.15 (J) S = 21.28 (J/K) V = 4.06 (cc) Cp = 12.24 (J/K)
albite anorthite sanidine
31.93 1.36 66.71

quartz mass = 17.02 (gm) density = 2.56 (gm/cc)
SiO2
G = -274755.99 (J) H = -240079.83 (J) S = 33.56 (J/K) V = 6.65 (cc) Cp = 19.73 (J/K)

rhm-oxide mass = 1.31 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.10Fe'"0.13Al0.08Ti0.90O3
G = -12612.97 (J) H = -10199.88 (J) S = 2.34 (J/K) V = 0.28 (cc) Cp = 1.20 (J/K)
geikielite hematite ilmenite pyrophanite corundum
9.56 6.32 75.66 4.68 3.79

apatite mass = 0.18 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2526.06 (J) H = -2165.92 (J) S = 0.35 (J/K) V = 0.06 (cc) Cp = 0.19 (J/K)

Total solids mass = 89.81 (gm) density = 2.89 (gm/cc)
G = -1353860.13 (J) H = -1168494.88 (J) S = 179.42 (J/K) V = 31.04 (cc) Cp = 104.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.82 (gm/cc)
G = -1516747.13 (J) H = -1302788.45 (J) S = 207.09 (J/K) V = 35.42 (cc) Cp = 118.06 (J/K)

Oxygen delta moles = -0.00310113 delta grams = -0.0992323
G = 710.02 (J) H = -73.99 (J) S = -0.76 (J/K) V = -266.38 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 750.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.16 COH = 0.97 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 8.02 (gm) density = 2.28 (gm/cc) viscosity = 3.41 (log 10 poise) (analysis in wt %)
G = -129574.94 (J) H = -106479.33 (J) S = 22.57 (J/K) V = 3.51 (cc) Cp = 11.22 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.02 0.12 10.66 0.25 0.00 0.68 0.75 0.11 0.00 0.00 2.38 5.81 3.43 1.14 9.66 0.00 0.00 0.00 0.00

garnet mass = 15.91 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.63Mg0.20)3Al2Si3O12
G = -209166.33 (J) H = -179181.06 (J) S = 29.31 (J/K) V = 4.00 (cc) Cp = 16.88 (J/K)
almandine grossular pyrope
62.56 17.41 20.03

orthopyroxene mass = 3.04 (gm) density = 3.59 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"1.03Mg0.89Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -38650.52 (J) H = -32726.87 (J) S = 5.79 (J/K) V = 0.85 (cc) Cp = 3.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.82 | 97.41 | 103.40 | 3.60 | -3.50 | 4.58 | 0.32 |

clinopyroxene mass = 10.16 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.82Fe"0.36Mg0.55Fe'"0.05Ti0.04Al0.20Si1.89O6
G = -145905.49 (J) H = -126122.68 (J) S = 19.34 (J/K) V = 2.99 (cc) Cp = 11.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.24 | 8.36 | 36.15 | 6.72 | 1.25 | 3.28 | 9.99 |

biotite mass = 5.39 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -84155.27 (J) H = -72354.47 (J) S = 11.53 (J/K) V = 1.93 (cc) Cp = 6.74 (J/K)

| annite | phlogopite |
|---|---|
| 6.90 | 93.10 |

feldspar mass = 27.47 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.76Ca0.14Al1.14Si2.86O8
G = -439983.97 (J) H = -381255.58 (J) S = 57.40 (J/K) V = 10.57 (cc) Cp = 33.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.74 | 13.95 | 10.31 |

feldspar mass = 9.76 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -151704.01 (J) H = -131249.88 (J) S = 19.99 (J/K) V = 3.84 (cc) Cp = 11.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.12 | 1.21 | 66.66 |

quartz mass = 18.61 (gm) density = 2.56 (gm/cc)
SiO2
G = -300032.27 (J) H = -262701.35 (J) S = 36.49 (J/K) V = 7.28 (cc) Cp = 21.54 (J/K)

rhm-oxide mass = 1.34 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.09Fe'"0.13Al0.07Ti0.90O3
G = -12800.84 (J) H = -10372.23 (J) S = 2.37 (J/K) V = 0.29 (cc) Cp = 1.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.74 | 6.53 | 76.44 | 4.76 | 3.52 |

apatite mass = 0.19 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2726.00 (J) H = -2342.67 (J) S = 0.37 (J/K) V = 0.06 (cc) Cp = 0.21 (J/K)

Total solids mass = 91.88 (gm) density = 2.89 (gm/cc)
G = -1385124.69 (J) H = -1198306.80 (J) S = 182.59 (J/K) V = 31.81 (cc) Cp = 106.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.83 (gm/cc)
G = -1514699.63 (J) H = -1304786.13 (J) S = 205.16 (J/K) V = 35.32 (cc) Cp = 117.84 (J/K)

Oxygen delta moles = -0.0030748 delta grams = -0.0983898

G = 696.47 (J)  H = -72.28 (J)  S = -0.75 (J/K)  V = -261.57 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 740.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = -0.17  COH = 0.93
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 6.28 (gm)  density = 2.25 (gm/cc)  viscosity = 2.76 (log 10 poise)  (analysis in wt %)
G = -101541.77 (J)  H = -83031.74 (J)  S = 18.27 (J/K)  V = 2.79 (cc)  Cp = 8.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.84 | 0.09 | 9.87 | 0.30 | 0.00 | 0.76 | 0.95 | 0.09 | 0.00 | 0.00 | 2.66 | 6.76 | 2.88 | 1.42 | 11.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 17.05 (gm)  density = 3.99 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.64Mg0.19)3Al2Si3O12
G = -222809.65 (J)  H = -191222.95 (J)  S = 31.18 (J/K)  V = 4.28 (cc)  Cp = 18.03 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.89 | 17.43 | 18.68 |

orthopyroxene  mass = 1.06 (gm)  density = 3.60 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"1.07Mg0.85Fe'"0.01Ti0.00Al0.08Si1.95O6
G = -13337.27 (J)  H = -11307.43 (J)  S = 2.00 (J/K)  V = 0.29 (cc)  Cp = 1.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.75 | 97.58 | 107.25 | 3.49 | -3.40 | 4.51 | 0.32 |

clinopyroxene  mass = 10.38 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.38Mg0.53Fe'"0.05Ti0.04Al0.20Si1.89O6
G = -148039.10 (J)  H = -128158.05 (J)  S = 19.62 (J/K)  V = 3.05 (cc)  Cp = 11.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.33 | 8.31 | 38.15 | 5.92 | 1.68 | 3.12 | 10.49 |

biotite  mass = 6.81 (gm)  density = 2.80 (gm/cc)  (analysis in mole %)
K(Fe"0.08Mg0.92)3AlSi3O10(OH)2
G = -105522.89 (J)  H = -90867.24 (J)  S = 14.47 (J/K)  V = 2.43 (cc)  Cp = 8.49 (J/K)

| annite | phlogopite |
|---|---|
| 8.45 | 91.55 |

feldspar  mass = 27.64 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.10Na0.77Ca0.13Al1.13Si2.87O8
G = -442065.86 (J)  H = -383866.70 (J)  S = 57.44 (J/K)  V = 10.64 (cc)  Cp = 34.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.89 | 12.83 | 10.29 |

feldspar  mass = 9.20 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -142712.28 (J)  H = -123741.70 (J)  S = 18.72 (J/K)  V = 3.62 (cc)  Cp = 10.95 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.13 | 1.07 | 66.79 |

quartz  mass = 19.93 (gm)  density = 2.59 (gm/cc)

SiO2
G = -320941.33 (J)  H = -282044.17 (J)  S = 38.39 (J/K)  V = 7.69 (cc)  Cp = 26.86 (J/K)

rhm-oxide  mass = 1.36 (gm)  density = 4.68 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.77Mg0.08Fe'"0.13Al0.07Ti0.90O3
G = -12903.73 (J)  H = -10478.34 (J)  S = 2.39 (J/K)  V = 0.29 (cc)  Cp = 1.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.05 | 6.68 | 77.19 | 4.79 | 3.29 |

apatite  mass = 0.19 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2791.72 (J)  H = -2404.59 (J)  S = 0.38 (J/K)  V = 0.06 (cc)  Cp = 0.21 (J/K)

Total solids  mass = 93.62 (gm)  density = 2.89 (gm/cc)
G = -1411123.83 (J)  H = -1224091.17 (J)  S = 184.61 (J/K)  V = 32.35 (cc)  Cp = 112.69 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.84 (gm/cc)
G = -1512665.60 (J)  H = -1307122.91 (J)  S = 202.87 (J/K)  V = 35.13 (cc)  Cp = 121.61 (J/K)

Oxygen  delta moles = -0.0030518  delta grams = -0.0976539
G = 683.81 (J)  H = -70.68 (J)  S = -0.74 (J/K)  V = -257.07 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 730.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.18  COH = 0.89
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 4.71 (gm)  density = 2.21 (gm/cc)  viscosity = 1.87 (log 10 poise)  (analysis in wt %)
G = -76353.79 (J)  H = -61865.16 (J)  S = 14.44 (J/K)  V = 2.13 (cc)  Cp = 6.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.53 | 0.05 | 9.06 | 0.35 | 0.00 | 0.84 | 1.28 | 0.08 | 0.00 | 0.00 | 3.30 | 7.95 | 2.23 | 2.01 | 14.32 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 17.58 (gm)  density = 4.00 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.65Mg0.18)3Al2Si3O12
G = -228705.42 (J)  H = -196686.55 (J)  S = 31.92 (J/K)  V = 4.40 (cc)  Cp = 18.53 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 64.76 | 17.73 | 17.51 |

clinopyroxene  mass = 10.40 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.11Ca0.81Fe"0.39Mg0.51Fe'"0.05Ti0.04Al0.20Si1.89O6
G = -147668.23 (J)  H = -128066.88 (J)  S = 19.54 (J/K)  V = 3.05 (cc)  Cp = 11.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.22 | 7.86 | 39.30 | 5.67 | 2.07 | 2.94 | 10.93 |

biotite  mass = 7.81 (gm)  density = 2.81 (gm/cc)  (analysis in mole %)
K(Fe"0.10Mg0.90)3AlSi3O10(OH)2
G = -120277.19 (J)  H = -103741.95 (J)  S = 16.48 (J/K)  V = 2.78 (cc)  Cp = 9.70 (J/K)

annite phlogopite
9.85 90.15

feldspar mass = 28.00 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.78Ca0.12Al1.12Si2.88O8
G = -447309.07 (J) H = -389262.32 (J) S = 57.86 (J/K) V = 10.78 (cc) Cp = 35.24 (J/K)
albite anorthite sanidine
77.71 12.24 10.04

feldspar mass = 8.89 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -137644.16 (J) H = -119610.94 (J) S = 17.98 (J/K) V = 3.49 (cc) Cp = 10.61 (J/K)
albite anorthite sanidine
31.65 0.96 67.39

quartz mass = 20.96 (gm) density = 2.60 (gm/cc)
SiO2
G = -337247.41 (J) H = -297009.11 (J) S = 40.11 (J/K) V = 8.07 (cc) Cp = 28.02 (J/K)

rhm-oxide mass = 1.36 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.78Mg0.08Fe'"0.13Al0.06Ti0.90O3
G = -12836.91 (J) H = -10450.56 (J) S = 2.38 (J/K) V = 0.29 (cc) Cp = 1.23 (J/K)
geikielite hematite ilmenite pyrophanite corundum
7.51 6.66 78.02 4.69 3.13

apatite mass = 0.18 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2605.65 (J) H = -2249.40 (J) S = 0.36 (J/K) V = 0.06 (cc) Cp = 0.20 (J/K)

Total solids mass = 95.20 (gm) density = 2.89 (gm/cc)
G = -1434294.03 (J) H = -1247077.71 (J) S = 186.63 (J/K) V = 32.93 (cc) Cp = 114.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.85 (gm/cc)
G = -1510647.82 (J) H = -1308942.87 (J) S = 201.07 (J/K) V = 35.06 (cc) Cp = 121.77 (J/K)

Oxygen delta moles = -0.00304869 delta grams = -0.0975543
G = 675.68 (J) H = -69.54 (J) S = -0.74 (J/K) V = -254.28 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.56 (gm/cc)  viscosity = 3.08 (log 10 poise)  (analysis in wt %)
G = -1648255.67 (J)  H = -1204059.07 (J)  S = 282.36 (J/K)  V = 39.05 (cc)  Cp = 144.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.23 | 0.00 | 6.58 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.39 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.08 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.56 (gm/cc)
G = -1648255.67 (J)  H = -1204059.07 (J)  S = 282.36 (J/K)  V = 39.05 (cc)  Cp = 144.55 (J/K)

Oxygen  delta moles = -5.20417e-17  delta grams = -1.66527e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.56 (gm/cc)  viscosity = 3.13 (log 10 poise)  (analysis in wt %)
G = -1645438.59 (J)  H = -1205506.13 (J)  S = 281.44 (J/K)  V = 39.02 (cc)  Cp = 144.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.96 | 0.81 | 13.34 | 1.23 | 0.00 | 6.58 | 0.09 | 3.75 | 0.00 | 0.00 | 4.18 | 3.38 | 2.50 | 0.17 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.13 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.56 (gm/cc)
G = -1645438.59 (J)  H = -1205506.13 (J)  S = 281.44 (J/K)  V = 39.02 (cc)  Cp = 144.54 (J/K)

Oxygen  delta moles = 3.53708e-06  delta grams = 0.000113182
G = -1.28 (J)  H = 0.15 (J)  S = 0.00 (J/K)  V = 0.46 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: intermediate

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.14 (gm)  density = 2.56 (gm/cc)  viscosity = 3.21 (log 10 poise)  (analysis in wt %)
G = -1628965.20 (J)  H = -1196962.56 (J)  S = 278.15 (J/K)  V = 38.69 (cc)  Cp = 143.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.04 | 0.81 | 13.44 | 1.22 | 0.00 | 6.53 | 0.09 | 3.54 | 0.00 | 0.00 | 4.21 | 3.41 | 2.52 | 0.17 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.86 (gm)  density = 3.27 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.41Mg1.50Fe'''0.02Ti0.00Al0.08Si1.95O6
G = -13650.92 (J)  H = -10343.00 (J)  S = 2.13 (J/K)  V = 0.26 (cc)  Cp = 1.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -42.48 | 96.28 | 40.73 | 3.00 | -2.73 | 4.96 | 0.24 |

Total solids  mass = 0.86 (gm)  density = 3.27 (gm/cc)
G = -13650.92 (J)  H = -10343.00 (J)  S = 2.13 (J/K)  V = 0.26 (cc)  Cp = 1.08 (J/K)

Viscosity of the System: 3.22 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.57 (gm/cc)
G = -1642616.12 (J)  H = -1207305.56 (J)  S = 280.28 (J/K)  V = 38.96 (cc)  Cp = 144.22 (J/K)

Oxygen  delta moles = -2.10524e-05  delta grams = -0.000673653
G = 7.58 (J)  H = -0.90 (J)  S = -0.01 (J/K)  V = -2.72 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.25 (gm)  density = 2.56 (gm/cc)  viscosity = 3.29 (log 10 poise)  (analysis in wt %)
G = -1612059.52 (J)  H = -1188054.02 (J)  S = 274.77 (J/K)  V = 38.35 (cc)  Cp = 141.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.12 | 0.82 | 13.54 | 1.22 | 0.00 | 6.46 | 0.09 | 3.32 | 0.00 | 0.00 | 4.24 | 3.44 | 2.54 | 0.17 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.75 (gm)  density = 3.28 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.42Mg1.48Fe'''0.02Ti0.00Al0.08Si1.95O6
G = -27743.65 (J)  H = -21058.24 (J)  S = 4.33 (J/K)  V = 0.54 (cc)  Cp = 2.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -43.85 | 96.08 | 42.18 | 3.07 | -2.80 | 5.06 | 0.26 |

Total solids  mass = 1.75 (gm)  density = 3.28 (gm/cc)

G = -27743.65 (J)  H = -21058.24 (J)  S = 4.33 (J/K)  V = 0.54 (cc)  Cp = 2.20 (J/K)

Viscosity of the System: 3.31 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.57 (gm/cc)
G = -1639803.17 (J)  H = -1209112.26 (J)  S = 279.10 (J/K)  V = 38.89 (cc)  Cp = 143.90 (J/K)

Oxygen  delta moles = -4.97213e-05  delta grams = -0.00159102
G = 17.78 (J)  H = -2.10 (J)  S = -0.01 (J/K)  V = -6.38 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 97.38 (gm)  density = 2.56 (gm/cc)  viscosity = 3.37 (log 10 poise)  (analysis in wt %)
G = -1595727.88 (J)  H = -1179517.58 (J)  S = 271.47 (J/K)  V = 38.02 (cc)  Cp = 140.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.20 | 0.83 | 13.64 | 1.21 | 0.00 | 6.39 | 0.09 | 3.11 | 0.00 | 0.00 | 4.27 | 3.48 | 2.57 | 0.18 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 2.62 (gm)  density = 3.28 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.44Mg1.47Fe'"0.02Ti0.00Al0.09Si1.95O6
G = -41272.91 (J)  H = -31382.86 (J)  S = 6.45 (J/K)  V = 0.80 (cc)  Cp = 3.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -45.25 | 95.87 | 43.68 | 3.14 | -2.87 | 5.17 | 0.27 |

Total solids  mass = 2.62 (gm)  density = 3.28 (gm/cc)
G = -41272.91 (J)  H = -31382.86 (J)  S = 6.45 (J/K)  V = 0.80 (cc)  Cp = 3.28 (J/K)

Viscosity of the System: 3.40 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.58 (gm/cc)
G = -1637000.79 (J)  H = -1210900.44 (J)  S = 277.92 (J/K)  V = 38.82 (cc)  Cp = 143.58 (J/K)

Oxygen  delta moles = -8.05452e-05  delta grams = -0.00257735
G = 28.60 (J)  H = -3.37 (J)  S = -0.02 (J/K)  V = -10.27 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.53 (gm)  density = 2.56 (gm/cc)  viscosity = 3.45 (log 10 poise)  (analysis in wt %)
G = -1579924.97 (J)  H = -1171322.79 (J)  S = 268.26 (J/K)  V = 37.70 (cc)  Cp = 138.95 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

63.29 0.83 13.74 1.20 0.00 6.31 0.09 2.91 0.00 0.00 4.29 3.51 2.59 0.18 1.04 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.46 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.45Mg1.45Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -54283.89 (J) H = -41348.74 (J) S = 8.49 (J/K) V = 1.05 (cc) Cp = 4.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -46.68 | 95.64 | 45.20 | 3.22 | -2.94 | 5.27 | 0.28 |

Total solids mass = 3.46 (gm) density = 3.29 (gm/cc)
G = -54283.89 (J) H = -41348.74 (J) S = 8.49 (J/K) V = 1.05 (cc) Cp = 4.33 (J/K)

Viscosity of the System: 3.50 (log 10 poise)

System mass = 100.00 (gm) density = 2.58 (gm/cc)
G = -1634208.86 (J) H = -1212671.53 (J) S = 276.75 (J/K) V = 38.76 (cc) Cp = 143.27 (J/K)

Oxygen delta moles = -0.000113675 delta grams = -0.00363748
G = 40.07 (J) H = -4.71 (J) S = -0.03 (J/K) V = -14.40 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: intermediate

T = 1240.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.12 delta HM = -4.84 NNO = 0.00 QFM = 0.17 COH = 2.08 IW = 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 95.71 (gm) density = 2.56 (gm/cc) viscosity = 3.53 (log 10 poise) (analysis in wt %)
G = -1564609.07 (J) H = -1163441.42 (J) S = 265.12 (J/K) V = 37.39 (cc) Cp = 137.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.38 | 0.84 | 13.84 | 1.19 | 0.00 | 6.23 | 0.09 | 2.73 | 0.00 | 0.00 | 4.32 | 3.53 | 2.61 | 0.18 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.29 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.47Mg1.43Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -66818.23 (J) H = -50985.41 (J) S = 10.46 (J/K) V = 1.30 (cc) Cp = 5.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -48.13 | 95.41 | 46.77 | 3.30 | -3.02 | 5.39 | 0.29 |

Total solids mass = 4.29 (gm) density = 3.30 (gm/cc)
G = -66818.23 (J) H = -50985.41 (J) S = 10.46 (J/K) V = 1.30 (cc) Cp = 5.34 (J/K)

Viscosity of the System: 3.59 (log 10 poise)

System mass = 100.00 (gm) density = 2.58 (gm/cc)
G = -1631427.30 (J) H = -1214426.83 (J) S = 275.58 (J/K) V = 38.69 (cc) Cp = 142.98 (J/K)

Oxygen delta moles = -0.000149257 delta grams = -0.00477606
G = 52.22 (J) H = -6.13 (J) S = -0.04 (J/K) V = -18.78 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1230.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.23  delta HM = -4.84  NNO = 0.00  QFM = 0.16  COH = 2.06  IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.90 (gm)  density = 2.56 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1549741.91 (J)  H = -1155847.47 (J)  S = 262.05 (J/K)  V = 37.09 (cc)  Cp = 136.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.47 | 0.85 | 13.94 | 1.18 | 0.00 | 6.14 | 0.10 | 2.55 | 0.00 | 0.00 | 4.34 | 3.56 | 2.63 | 0.18 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.09 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.48Mg1.41Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -78914.09 (J)  H = -60320.07 (J)  S = 12.37 (J/K)  V = 1.54 (cc)  Cp = 6.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -49.62 | 95.16 | 48.37 | 3.38 | -3.10 | 5.50 | 0.30 |

Total solids  mass = 5.09 (gm)  density = 3.31 (gm/cc)
G = -78914.09 (J)  H = -60320.07 (J)  S = 12.37 (J/K)  V = 1.54 (cc)  Cp = 6.32 (J/K)

Viscosity of the System: 3.69 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.59 (gm/cc)
G = -1628656.00 (J)  H = -1216167.54 (J)  S = 274.42 (J/K)  V = 38.63 (cc)  Cp = 142.69 (J/K)

Oxygen  delta moles = -0.000187428  delta grams = -0.00599747
G = 65.09 (J)  H = -7.63 (J)  S = -0.05 (J/K)  V = -23.42 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1220.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.34  delta HM = -4.84  NNO = 0.00  QFM = 0.15  COH = 2.04  IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.12 (gm)  density = 2.56 (gm/cc)  viscosity = 3.70 (log 10 poise)  (analysis in wt %)
G = -1535288.67 (J)  H = -1148517.16 (J)  S = 259.03 (J/K)  V = 36.80 (cc)  Cp = 135.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.56 | 0.85 | 14.04 | 1.17 | 0.00 | 6.04 | 0.10 | 2.38 | 0.00 | 0.00 | 4.37 | 3.59 | 2.65 | 0.18 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.88 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.50Mg1.39Fe'"0.02Ti0.00Al0.09Si1.94O6
G = -90606.23 (J)  H = -69377.57 (J)  S = 14.22 (J/K)  V = 1.77 (cc)  Cp = 7.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -51.13 | 94.91 | 50.00 | 3.47 | -3.18 | 5.62 | 0.32 |

Total solids  mass = 5.88 (gm)  density = 3.31 (gm/cc)
G = -90606.23 (J)  H = -69377.57 (J)  S = 14.22 (J/K)  V = 1.77 (cc)  Cp = 7.27 (J/K)

Viscosity of the System: 3.78 (log 10 poise)

System mass = 99.99 (gm) density = 2.59 (gm/cc)
G = -1625894.90 (J) H = -1217894.73 (J) S = 273.25 (J/K) V = 38.57 (cc) Cp = 142.41 (J/K)

Oxygen delta moles = -0.000228313 delta grams = -0.00730573
G = 78.70 (J) H = -9.21 (J) S = -0.06 (J/K) V = -28.34 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 93.34 (gm) density = 2.56 (gm/cc) viscosity = 3.78 (log 10 poise) (analysis in wt %)
G = -1521217.94 (J) H = -1141428.89 (J) S = 256.07 (J/K) V = 36.51 (cc) Cp = 133.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.66 | 0.86 | 14.13 | 1.16 | 0.00 | 5.93 | 0.10 | 2.22 | 0.00 | 0.00 | 4.39 | 3.62 | 2.68 | 0.18 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.65 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.52Mg1.37Fe'"0.02Ti0.00Al0.10Si1.94O6
G = -101926.00 (J) H = -78180.47 (J) S = 16.01 (J/K) V = 2.00 (cc) Cp = 8.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.65 | 94.65 | 51.65 | 3.55 | -3.27 | 5.74 | 0.33 |

Total solids mass = 6.65 (gm) density = 3.32 (gm/cc)
G = -101926.00 (J) H = -78180.47 (J) S = 16.01 (J/K) V = 2.00 (cc) Cp = 8.20 (J/K)

Viscosity of the System: 3.88 (log 10 poise)

System mass = 99.99 (gm) density = 2.60 (gm/cc)
G = -1623143.95 (J) H = -1219609.35 (J) S = 272.08 (J/K) V = 38.51 (cc) Cp = 142.14 (J/K)

Oxygen delta moles = -0.000272023 delta grams = -0.0087044
G = 93.07 (J) H = -10.87 (J) S = -0.07 (J/K) V = -33.54 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 92.58 (gm) density = 2.56 (gm/cc) viscosity = 3.87 (log 10 poise) (analysis in wt %)
G = -1507499.39 (J) H = -1134520.97 (J) S = 253.18 (J/K) V = 36.22 (cc) Cp = 126.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.76 | 0.87 | 14.22 | 1.14 | 0.00 | 5.81 | 0.10 | 2.07 | 0.00 | 0.00 | 4.41 | 3.65 | 2.70 | 0.19 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.41 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.53Mg1.35Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -112903.60 (J) H = -86750.68 (J) S = 17.75 (J/K) V = 2.22 (cc) Cp = 9.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.20 | 94.38 | 53.32 | 3.65 | -3.36 | 5.86 | 0.34 |

Total solids mass = 7.41 (gm) density = 3.33 (gm/cc)
G = -112903.60 (J) H = -86750.68 (J) S = 17.75 (J/K) V = 2.22 (cc) Cp = 9.10 (J/K)

Viscosity of the System: 3.98 (log 10 poise)

System mass = 99.99 (gm) density = 2.60 (gm/cc)
G = -1620402.99 (J) H = -1221271.64 (J) S = 270.94 (J/K) V = 38.45 (cc) Cp = 135.93 (J/K)

Oxygen delta moles = -0.000318665 delta grams = -0.0101969
G = 108.21 (J) H = -12.62 (J) S = -0.08 (J/K) V = -39.03 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 91.84 (gm) density = 2.55 (gm/cc) viscosity = 3.96 (log 10 poise) (analysis in wt %)
G = -1494101.74 (J) H = -1127793.83 (J) S = 250.36 (J/K) V = 35.95 (cc) Cp = 125.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.86 | 0.87 | 14.32 | 1.13 | 0.00 | 5.69 | 0.10 | 1.92 | 0.00 | 0.00 | 4.43 | 3.68 | 2.72 | 0.19 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.15 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.55Mg1.33Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -123569.96 (J) H = -95110.92 (J) S = 19.45 (J/K) V = 2.44 (cc) Cp = 9.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.76 | 94.10 | 55.02 | 3.74 | -3.45 | 5.99 | 0.36 |

Total solids mass = 8.15 (gm) density = 3.34 (gm/cc)
G = -123569.96 (J) H = -95110.92 (J) S = 19.45 (J/K) V = 2.44 (cc) Cp = 9.98 (J/K)

Viscosity of the System: 4.08 (log 10 poise)

System mass = 99.99 (gm) density = 2.60 (gm/cc)
G = -1617671.71 (J) H = -1222904.75 (J) S = 269.81 (J/K) V = 38.39 (cc) Cp = 135.68 (J/K)

Oxygen delta moles = -0.000368355 delta grams = -0.0117869
G = 124.13 (J) H = -14.45 (J) S = -0.09 (J/K) V = -44.81 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: intermediate

T = 1180.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.13 COH = 1.97 IW

= 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 91.10 (gm) density = 2.55 (gm/cc) viscosity = 4.05 (log 10 poise) (analysis in wt %)
G = -1481003.90 (J) H = -1121251.41 (J) S = 247.57 (J/K) V = 35.67 (cc) Cp = 124.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.97 | 0.88 | 14.41 | 1.11 | 0.00 | 5.56 | 0.10 | 1.79 | 0.00 | 0.00 | 4.44 | 3.71 | 2.74 | 0.19 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.89 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.57Mg1.30Fe'"0.03Ti0.00Al0.10Si1.94O6
G = -133946.16 (J) H = -103276.62 (J) S = 21.11 (J/K) V = 2.65 (cc) Cp = 10.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.32 | 93.81 | 56.72 | 3.85 | -3.55 | 6.13 | 0.37 |

Total solids mass = 8.89 (gm) density = 3.35 (gm/cc)
G = -133946.16 (J) H = -103276.62 (J) S = 21.11 (J/K) V = 2.65 (cc) Cp = 10.85 (J/K)

Viscosity of the System: 4.18 (log 10 poise)

System mass = 99.99 (gm) density = 2.61 (gm/cc)
G = -1614950.06 (J) H = -1224528.03 (J) S = 268.67 (J/K) V = 38.33 (cc) Cp = 135.44 (J/K)

Oxygen delta moles = -0.00042116 delta grams = -0.0134766
G = 140.84 (J) H = -16.37 (J) S = -0.11 (J/K) V = -50.88 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1170.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.12 COH = 1.95 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 90.37 (gm) density = 2.55 (gm/cc) viscosity = 4.14 (log 10 poise) (analysis in wt %)
G = -1468188.40 (J) H = -1114881.31 (J) S = 244.82 (J/K) V = 35.41 (cc) Cp = 123.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.08 | 0.89 | 14.50 | 1.09 | 0.00 | 5.42 | 0.10 | 1.66 | 0.00 | 0.00 | 4.46 | 3.74 | 2.76 | 0.19 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.61 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.58Mg1.28Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -144049.65 (J) H = -111260.62 (J) S = 22.72 (J/K) V = 2.86 (cc) Cp = 11.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.89 | 93.51 | 58.43 | 3.95 | -3.66 | 6.26 | 0.39 |

Total solids mass = 9.61 (gm) density = 3.36 (gm/cc)
G = -144049.65 (J) H = -111260.62 (J) S = 22.72 (J/K) V = 2.86 (cc) Cp = 11.70 (J/K)

Viscosity of the System: 4.28 (log 10 poise)

System mass = 99.98 (gm) density = 2.61 (gm/cc)
G = -1612238.05 (J) H = -1226141.93 (J) S = 267.54 (J/K) V = 38.27 (cc) Cp = 135.19 (J/K)

Oxygen delta moles = -0.000477119 delta grams = -0.0152672
G = 158.33 (J) H = -18.37 (J) S = -0.12 (J/K) V = -57.25 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1160.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.12 COH = 1.93 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 89.66 (gm) density = 2.55 (gm/cc) viscosity = 4.23 (log 10 poise) (analysis in wt %)
G = -1455640.83 (J) H = -1108673.17 (J) S = 242.10 (J/K) V = 35.14 (cc) Cp = 122.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.19 | 0.89 | 14.59 | 1.07 | 0.00 | 5.27 | 0.10 | 1.54 | 0.00 | 0.00 | 4.48 | 3.77 | 2.79 | 0.19 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.33 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.60Mg1.26Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -153894.88 (J) H = -119073.65 (J) S = 24.30 (J/K) V = 3.07 (cc) Cp = 12.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.45 | 93.21 | 60.13 | 4.06 | -3.76 | 6.41 | 0.41 |

Total solids mass = 10.33 (gm) density = 3.37 (gm/cc)
G = -153894.88 (J) H = -119073.65 (J) S = 24.30 (J/K) V = 3.07 (cc) Cp = 12.53 (J/K)

Viscosity of the System: 4.38 (log 10 poise)

System mass = 99.98 (gm) density = 2.62 (gm/cc)
G = -1609535.71 (J) H = -1227746.82 (J) S = 266.40 (J/K) V = 38.21 (cc) Cp = 134.96 (J/K)

Oxygen delta moles = -0.000536246 delta grams = -0.0171592
G = 176.58 (J) H = -20.46 (J) S = -0.14 (J/K) V = -63.90 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1150.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.11 COH = 1.91 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 88.55 (gm) density = 2.55 (gm/cc) viscosity = 4.33 (log 10 poise) (analysis in wt %)
G = -1437969.57 (J) H = -1098670.90 (J) S = 238.41 (J/K) V = 34.76 (cc) Cp = 120.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.41 | 0.90 | 14.70 | 1.03 | 0.00 | 5.03 | 0.10 | 1.43 | 0.00 | 0.00 | 4.43 | 3.81 | 2.82 | 0.19 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.14 (gm) density = 3.37 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.07Fe"0.61Mg1.24Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -120679.10 (J) H = -93557.65 (J) S = 19.06 (J/K) V = 2.41 (cc) Cp = 9.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.74 | 93.02 | 61.46 | 4.19 | -3.88 | 6.53 | 0.42 |

clinopyroxene mass = 3.29 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.14Fe"0.65Mg1.10Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -48192.43 (J) H = -37216.04 (J) S = 7.71 (J/K) V = 0.98 (cc) Cp = 3.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.29 | 84.37 | 64.69 | 5.19 | -4.63 | 8.52 | 1.14 |

Total solids mass = 11.43 (gm) density = 3.37 (gm/cc)
G = -168871.53 (J) H = -130773.69 (J) S = 26.77 (J/K) V = 3.39 (cc) Cp = 13.75 (J/K)

Viscosity of the System: 4.50 (log 10 poise)

System mass = 99.98 (gm) density = 2.62 (gm/cc)
G = -1606841.09 (J) H = -1229444.59 (J) S = 265.18 (J/K) V = 38.14 (cc) Cp = 134.59 (J/K)

Oxygen delta moles = -0.000602422 delta grams = -0.0192768
G = 196.82 (J) H = -22.76 (J) S = -0.15 (J/K) V = -71.28 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1140.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.89 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 86.98 (gm) density = 2.54 (gm/cc) viscosity = 4.45 (log 10 poise) (analysis in wt %)
G = -1413971.40 (J) H = -1083931.16 (J) S = 233.55 (J/K) V = 34.22 (cc) Cp = 118.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.74 | 0.91 | 14.84 | 0.97 | 0.00 | 4.70 | 0.10 | 1.32 | 0.00 | 0.00 | 4.31 | 3.87 | 2.87 | 0.20 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.43 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.07Fe"0.62Mg1.24Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -35897.70 (J) H = -27893.01 (J) S = 5.66 (J/K) V = 0.72 (cc) Cp = 2.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.64 | 93.00 | 62.26 | 4.32 | -4.00 | 6.62 | 0.44 |

clinopyroxene mass = 10.57 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.15Fe"0.65Mg1.09Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -154287.40 (J) H = -119433.61 (J) S = 24.66 (J/K) V = 3.13 (cc) Cp = 12.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.61 | 83.92 | 65.24 | 5.36 | -4.77 | 8.64 | 1.22 |

Total solids mass = 12.99 (gm) density = 3.38 (gm/cc)
G = -190185.09 (J) H = -147326.62 (J) S = 30.33 (J/K) V = 3.85 (cc) Cp = 15.46 (J/K)

Viscosity of the System: 4.65 (log 10 poise)

System mass = 99.98 (gm) density = 2.63 (gm/cc)
G = -1604156.49 (J) H = -1231257.78 (J) S = 263.88 (J/K) V = 38.06 (cc) Cp = 134.07 (J/K)

Oxygen delta moles = -0.000673826 delta grams = -0.0215616
G = 218.43 (J) H = -25.21 (J) S = -0.17 (J/K) V = -79.17 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: intermediate

T = 1130.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.10 COH = 1.87 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 85.81 (gm) density = 2.54 (gm/cc) viscosity = 4.57 (log 10 poise) (analysis in wt %)
G = -1395389.93 (J) H = -1073072.36 (J) S = 229.71 (J/K) V = 33.81 (cc) Cp = 116.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.99 | 0.92 | 14.96 | 0.93 | 0.00 | 4.45 | 0.11 | 1.22 | 0.00 | 0.00 | 4.23 | 3.92 | 2.91 | 0.20 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 14.17 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.16Fe"0.66Mg1.07Fe'"0.04Ti0.00Al0.16Si1.91O6
G = -206097.89 (J) H = -159902.43 (J) S = 32.92 (J/K) V = 4.19 (cc) Cp = 16.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.87 | 83.08 | 66.01 | 5.55 | -4.92 | 8.84 | 1.31 |

Total solids mass = 14.17 (gm) density = 3.39 (gm/cc)
G = -206097.89 (J) H = -159902.43 (J) S = 32.92 (J/K) V = 4.19 (cc) Cp = 16.75 (J/K)

Viscosity of the System: 4.78 (log 10 poise)

System mass = 99.98 (gm) density = 2.63 (gm/cc)
G = -1601487.81 (J) H = -1232974.80 (J) S = 262.63 (J/K) V = 37.99 (cc) Cp = 133.67 (J/K)

Oxygen delta moles = -0.000739727 delta grams = -0.0236704
G = 237.90 (J) H = -27.41 (J) S = -0.19 (J/K) V = -86.30 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 84.91 (gm) density = 2.54 (gm/cc) viscosity = 4.67 (log 10 poise) (analysis in wt %)
G = -1380585.21 (J) H = -1064927.36 (J) S = 226.58 (J/K) V = 33.49 (cc) Cp = 115.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.18 | 0.93 | 15.06 | 0.89 | 0.00 | 4.25 | 0.11 | 1.12 | 0.00 | 0.00 | 4.19 | 3.95 | 2.94 | 0.20 | 1.19 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 15.07 (gm) density = 3.39 (gm/cc) (analysis in mole %)

cpx Na0.01Ca0.17Fe"0.67Mg1.04Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -218248.02 (J) H = -169701.18 (J) S = 34.85 (J/K) V = 4.44 (cc) Cp = 17.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.94 | 81.80 | 66.92 | 5.77 | -5.10 | 9.11 | 1.44 |

Total solids mass = 15.07 (gm) density = 3.39 (gm/cc)
G = -218248.02 (J) H = -169701.18 (J) S = 34.85 (J/K) V = 4.44 (cc) Cp = 17.75 (J/K)

Viscosity of the System: 4.90 (log 10 poise)

System mass = 99.97 (gm) density = 2.64 (gm/cc)
G = -1598833.23 (J) H = -1234628.54 (J) S = 261.43 (J/K) V = 37.93 (cc) Cp = 133.36 (J/K)

Oxygen delta moles = -0.000802149 delta grams = -0.0256678
G = 255.92 (J) H = -29.43 (J) S = -0.20 (J/K) V = -92.91 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1110.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.08 COH = 1.83 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 84.00 (gm) density = 2.53 (gm/cc) viscosity = 4.78 (log 10 poise) (analysis in wt %)
G = -1365782.98 (J) H = -1056719.46 (J) S = 223.45 (J/K) V = 33.16 (cc) Cp = 114.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.37 | 0.94 | 15.15 | 0.86 | 0.00 | 4.05 | 0.11 | 1.03 | 0.00 | 0.00 | 4.13 | 3.99 | 2.97 | 0.20 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 15.97 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.18Fe"0.68Mg1.01Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -230407.87 (J) H = -179562.40 (J) S = 36.76 (J/K) V = 4.70 (cc) Cp = 18.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.79 | 80.41 | 67.70 | 6.00 | -5.28 | 9.39 | 1.58 |

Total solids mass = 15.97 (gm) density = 3.40 (gm/cc)
G = -230407.87 (J) H = -179562.40 (J) S = 36.76 (J/K) V = 4.70 (cc) Cp = 18.75 (J/K)

Viscosity of the System: 5.03 (log 10 poise)

System mass = 99.97 (gm) density = 2.64 (gm/cc)
G = -1596190.85 (J) H = -1236281.86 (J) S = 260.21 (J/K) V = 37.86 (cc) Cp = 133.05 (J/K)

Oxygen delta moles = -0.000864474 delta grams = -0.0276621
G = 273.60 (J) H = -31.41 (J) S = -0.22 (J/K) V = -99.41 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1100.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.81 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 83.09 (gm) density = 2.53 (gm/cc) viscosity = 4.89 (log 10 poise) (analysis in wt %)
G = -1350965.80 (J) H = -1048432.27 (J) S = 220.32 (J/K) V = 32.84 (cc) Cp = 112.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.58 | 0.94 | 15.25 | 0.82 | 0.00 | 3.85 | 0.11 | 0.94 | 0.00 | 0.00 | 4.06 | 4.03 | 3.01 | 0.21 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 16.88 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.68Mg0.99Fe'"0.04Ti0.00Al0.18Si1.90O6
G = -242595.34 (J) H = -189503.09 (J) S = 38.66 (J/K) V = 4.96 (cc) Cp = 19.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.43 | 78.92 | 68.34 | 6.23 | -5.47 | 9.66 | 1.74 |

Total solids mass = 16.88 (gm) density = 3.40 (gm/cc)
G = -242595.34 (J) H = -189503.09 (J) S = 38.66 (J/K) V = 4.96 (cc) Cp = 19.75 (J/K)

Viscosity of the System: 5.15 (log 10 poise)

System mass = 99.97 (gm) density = 2.64 (gm/cc)
G = -1593561.15 (J) H = -1237935.35 (J) S = 258.99 (J/K) V = 37.80 (cc) Cp = 132.73 (J/K)

Oxygen delta moles = -0.00092603 delta grams = -0.0296318
G = 290.72 (J) H = -33.31 (J) S = -0.24 (J/K) V = -105.72 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: intermediate

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 82.18 (gm) density = 2.53 (gm/cc) viscosity = 5.00 (log 10 poise) (analysis in wt %)
G = -1336127.33 (J) H = -1040057.89 (J) S = 217.20 (J/K) V = 32.52 (cc) Cp = 111.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.79 | 0.95 | 15.34 | 0.79 | 0.00 | 3.64 | 0.11 | 0.87 | 0.00 | 0.00 | 3.98 | 4.06 | 3.04 | 0.21 | 1.23 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 17.79 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.69Mg0.96Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -254817.25 (J) H = -199531.42 (J) S = 40.56 (J/K) V = 5.22 (cc) Cp = 20.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.84 | 77.33 | 68.84 | 6.47 | -5.65 | 9.93 | 1.92 |

Total solids mass = 17.79 (gm) density = 3.41 (gm/cc)
G = -254817.25 (J) H = -199531.42 (J) S = 40.56 (J/K) V = 5.22 (cc) Cp = 20.75 (J/K)

Viscosity of the System: 5.28 (log 10 poise)

System mass = 99.97 (gm) density = 2.65 (gm/cc)
G = -1590944.58 (J) H = -1239589.31 (J) S = 257.75 (J/K) V = 37.73 (cc) Cp = 132.40 (J/K)

Oxygen delta moles = -0.000986102 delta grams = -0.0315541
G = 307.07 (J) H = -35.11 (J) S = -0.25 (J/K) V = -111.76 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1080.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.06 COH = 1.76 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 78.86 (gm) density = 2.52 (gm/cc) viscosity = 5.10 (log 10 poise) (analysis in wt %)
G = -1281397.85 (J) H = -1000177.34 (J) S = 207.83 (J/K) V = 31.26 (cc) Cp = 106.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.20 | 0.99 | 15.15 | 0.76 | 0.00 | 3.48 | 0.12 | 0.79 | 0.00 | 0.00 | 3.86 | 4.02 | 3.15 | 0.22 | 1.28 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 18.68 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.71Mg0.95Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -266079.10 (J) H = -208731.09 (J) S = 42.38 (J/K) V = 5.46 (cc) Cp = 21.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.46 | 77.27 | 70.56 | 6.40 | -5.54 | 9.82 | 1.95 |

feldspar mass = 2.43 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.60Ca0.36Al1.36Si2.64O8
G = -40835.24 (J) H = -32926.84 (J) S = 5.84 (J/K) V = 0.93 (cc) Cp = 2.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.26 | 36.11 | 3.64 |

Total solids mass = 21.11 (gm) density = 3.30 (gm/cc)
G = -306914.34 (J) H = -241657.93 (J) S = 48.23 (J/K) V = 6.39 (cc) Cp = 24.69 (J/K)

Viscosity of the System: 5.46 (log 10 poise)

System mass = 99.96 (gm) density = 2.65 (gm/cc)
G = -1588312.19 (J) H = -1241835.27 (J) S = 256.05 (J/K) V = 37.65 (cc) Cp = 131.65 (J/K)

Oxygen delta moles = -0.00110174 delta grams = -0.0352544
G = 340.28 (J) H = -38.83 (J) S = -0.28 (J/K) V = -123.95 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1070.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.05 COH = 1.74 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 75.35 (gm) density = 2.52 (gm/cc) viscosity = 5.19 (log 10 poise) (analysis in wt %)
G = -1223842.04 (J) H = -957823.72 (J) S = 198.06 (J/K) V = 29.94 (cc) Cp = 102.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

66.64 1.03 14.93 0.72 0.00 3.31 0.12 0.73 0.00 0.00 3.74 3.95 3.27 0.23 1.34 0.00 0.00 0.00 0.00

clinopyroxene mass = 19.50 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.72Mg0.93Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -276197.23 (J) H = -217058.99 (J) S = 44.03 (J/K) V = 5.69 (cc) Cp = 22.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.28 | 77.41 | 72.38 | 6.27 | -5.39 | 9.64 | 1.97 |

feldspar mass = 5.11 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.61Ca0.35Al1.35Si2.65O8
G = -85653.12 (J) H = -69214.31 (J) S = 12.24 (J/K) V = 1.95 (cc) Cp = 6.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.08 | 35.06 | 3.86 |

Total solids mass = 24.61 (gm) density = 3.22 (gm/cc)
G = -361850.34 (J) H = -286273.30 (J) S = 56.27 (J/K) V = 7.64 (cc) Cp = 28.84 (J/K)

Viscosity of the System: 5.64 (log 10 poise)

System mass = 99.96 (gm) density = 2.66 (gm/cc)
G = -1585692.38 (J) H = -1244097.02 (J) S = 254.32 (J/K) V = 37.57 (cc) Cp = 130.87 (J/K)

Oxygen delta moles = -0.00122662 delta grams = -0.0392503
G = 375.73 (J) H = -42.79 (J) S = -0.31 (J/K) V = -136.98 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: intermediate

T = 1060.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.04 COH = 1.72 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 72.11 (gm) density = 2.51 (gm/cc) viscosity = 5.28 (log 10 poise) (analysis in wt %)
G = -1170654.91 (J) H = -918673.75 (J) S = 189.01 (J/K) V = 28.71 (cc) Cp = 97.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.06 | 1.07 | 14.72 | 0.69 | 0.00 | 3.14 | 0.13 | 0.67 | 0.00 | 0.00 | 3.63 | 3.87 | 3.39 | 0.24 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 20.25 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.74Mg0.92Fe'"0.04Ti0.00Al0.18Si1.90O6
G = -285354.59 (J) H = -224680.24 (J) S = 45.51 (J/K) V = 5.90 (cc) Cp = 23.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.86 | 77.49 | 74.04 | 6.15 | -5.24 | 9.44 | 1.98 |

feldspar mass = 7.59 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.34Al1.34Si2.66O8
G = -127081.13 (J) H = -102914.38 (J) S = 18.13 (J/K) V = 2.89 (cc) Cp = 9.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.83 | 34.09 | 4.08 |

Total solids mass = 27.85 (gm) density = 3.17 (gm/cc)

G = -412435.71 (J)  H = -327594.63 (J)  S = 63.64 (J/K)  V = 8.79 (cc)  Cp = 32.67 (J/K)

Viscosity of the System: 5.83 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.67 (gm/cc)
G = -1583090.62 (J)  H = -1246268.38 (J)  S = 252.65 (J/K)  V = 37.50 (cc)  Cp = 130.15 (J/K)

Oxygen  delta moles = -0.00134973  delta grams = -0.0431899
G = 410.02 (J)  H = -46.60 (J)  S = -0.34 (J/K)  V = -149.61 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1050.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.04  COH = 1.70  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 69.11 (gm)  density = 2.51 (gm/cc)  viscosity = 5.37 (log 10 poise)  (analysis in wt %)
G = -1121516.92 (J)  H = -882497.00 (J)  S = 180.64 (J/K)  V = 27.57 (cc)  Cp = 93.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.47 | 1.12 | 14.51 | 0.66 | 0.00 | 2.96 | 0.13 | 0.61 | 0.00 | 0.00 | 3.54 | 3.78 | 3.51 | 0.25 | 1.46 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 20.95 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.76Mg0.90Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -293634.75 (J)  H = -231657.81 (J)  S = 46.84 (J/K)  V = 6.09 (cc)  Cp = 24.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.23 | 77.51 | 75.55 | 6.03 | -5.09 | 9.24 | 1.99 |

feldspar  mass = 9.89 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.04Na0.63Ca0.33Al1.33Si2.67O8
G = -165355.10 (J)  H = -134201.91 (J)  S = 23.54 (J/K)  V = 3.77 (cc)  Cp = 12.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.51 | 33.19 | 4.30 |

Total solids  mass = 30.84 (gm)  density = 3.13 (gm/cc)
G = -458989.85 (J)  H = -365859.72 (J)  S = 70.39 (J/K)  V = 9.86 (cc)  Cp = 36.20 (J/K)

Viscosity of the System: 6.02 (log 10 poise)

System  mass = 99.95 (gm)  density = 2.67 (gm/cc)
G = -1580506.77 (J)  H = -1248356.73 (J)  S = 251.03 (J/K)  V = 37.43 (cc)  Cp = 129.47 (J/K)

Oxygen  delta moles = -0.00147037  delta grams = -0.04705
G = 442.93 (J)  H = -50.23 (J)  S = -0.37 (J/K)  V = -161.76 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: intermediate

T = 1040.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.03  COH = 1.67  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 66.34 (gm) density = 2.50 (gm/cc) viscosity = 5.46 (log 10 poise) (analysis in wt %)
G = -1076116.53 (J) H = -849068.09 (J) S = 172.90 (J/K) V = 26.52 (cc) Cp = 89.39 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.87 | 1.16 | 14.32 | 0.62 | 0.00 | 2.78 | 0.14 | 0.57 | 0.00 | 0.00 | 3.45 | 3.69 | 3.62 | 0.26 | 1.52 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 21.58 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.77Mg0.89Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -301115.36 (J) H = -238049.64 (J) S = 48.03 (J/K) V = 6.26 (cc) Cp = 24.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.39 | 77.48 | 76.92 | 5.92 | -4.95 | 9.03 | 2.00 |

feldspar mass = 12.02 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.63Ca0.32Al1.32Si2.68O8
G = -200708.79 (J) H = -163252.16 (J) S = 28.52 (J/K) V = 4.59 (cc) Cp = 14.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.12 | 32.36 | 4.51 |

Total solids mass = 33.61 (gm) density = 3.10 (gm/cc)
G = -501824.14 (J) H = -401301.80 (J) S = 76.55 (J/K) V = 10.85 (cc) Cp = 39.57 (J/K)

Viscosity of the System: 6.22 (log 10 poise)

System mass = 99.95 (gm) density = 2.67 (gm/cc)
G = -1577940.68 (J) H = -1250369.89 (J) S = 249.45 (J/K) V = 37.37 (cc) Cp = 128.97 (J/K)

Oxygen delta moles = -0.0015879 delta grams = -0.0508108
G = 474.31 (J) H = -53.67 (J) S = -0.40 (J/K) V = -173.37 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1030.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.02 COH = 1.65 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 63.78 (gm) density = 2.50 (gm/cc) viscosity = 5.55 (log 10 poise) (analysis in wt %)
G = -1034148.88 (J) H = -818165.53 (J) S = 165.74 (J/K) V = 25.54 (cc) Cp = 85.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.25 | 1.20 | 14.14 | 0.59 | 0.00 | 2.61 | 0.14 | 0.52 | 0.00 | 0.00 | 3.36 | 3.60 | 3.73 | 0.27 | 1.58 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 22.16 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.78Mg0.88Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -307869.41 (J) H = -243909.79 (J) S = 49.08 (J/K) V = 6.42 (cc) Cp = 25.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.36 | 77.40 | 78.14 | 5.81 | -4.81 | 8.81 | 2.02 |

feldspar mass = 14.00 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.05Na0.64Ca0.32Al1.32Si2.68O8
G = -233373.89 (J) H = -190239.10 (J) S = 33.10 (J/K) V = 5.35 (cc) Cp = 17.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.68 | 31.59 | 4.73 |

Total solids mass = 36.17 (gm) density = 3.07 (gm/cc)
G = -541243.30 (J) H = -434148.89 (J) S = 82.18 (J/K) V = 11.77 (cc) Cp = 42.59 (J/K)

Viscosity of the System: 6.41 (log 10 poise)

System mass = 99.95 (gm) density = 2.68 (gm/cc)
G = -1575392.18 (J) H = -1252314.43 (J) S = 247.92 (J/K) V = 37.30 (cc) Cp = 128.41 (J/K)

Oxygen delta moles = -0.0017018 delta grams = -0.0544557
G = 504.03 (J) H = -56.91 (J) S = -0.43 (J/K) V = -184.39 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: intermediate

T = 1020.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.01 COH = 1.63 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 61.41 (gm) density = 2.49 (gm/cc) viscosity = 5.64 (log 10 poise) (analysis in wt %)
G = -995333.45 (J) H = -789585.79 (J) S = 159.11 (J/K) V = 24.63 (cc) Cp = 82.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.62 | 1.25 | 13.96 | 0.56 | 0.00 | 2.44 | 0.15 | 0.49 | 0.00 | 0.00 | 3.28 | 3.50 | 3.84 | 0.28 | 1.64 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 22.69 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.79Mg0.87Fe'"0.04Ti0.01Al0.16Si1.90O6
G = -313966.14 (J) H = -249289.29 (J) S = 50.01 (J/K) V = 6.56 (cc) Cp = 25.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.15 | 77.27 | 79.23 | 5.71 | -4.68 | 8.59 | 2.03 |

feldspar mass = 15.84 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.64Ca0.31Al1.31Si2.69O8
G = -263561.49 (J) H = -215321.09 (J) S = 37.30 (J/K) V = 6.05 (cc) Cp = 19.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.19 | 30.87 | 4.94 |

Total solids mass = 38.53 (gm) density = 3.06 (gm/cc)
G = -577527.63 (J) H = -464610.38 (J) S = 87.32 (J/K) V = 12.61 (cc) Cp = 45.38 (J/K)

Viscosity of the System: 6.62 (log 10 poise)

System mass = 99.94 (gm) density = 2.68 (gm/cc)
G = -1572861.08 (J) H = -1254196.17 (J) S = 246.43 (J/K) V = 37.24 (cc) Cp = 127.89 (J/K)

Oxygen delta moles = -0.00181169 delta grams = -0.0579718
G = 532.00 (J) H = -59.94 (J) S = -0.46 (J/K) V = -194.79 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 1010.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.00  COH = 1.60
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 59.22 (gm)  density = 2.49 (gm/cc)  viscosity = 5.73 (log 10 poise)  (analysis in wt %)
G = -959475.36 (J)  H = -763193.87 (J)  S = 152.97 (J/K)  V = 23.79 (cc)  Cp = 79.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.98 | 1.29 | 13.80 | 0.52 | 0.00 | 2.27 | 0.15 | 0.45 | 0.00 | 0.00 | 3.20 | 3.39 | 3.95 | 0.29 | 1.70 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 23.12 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.80Mg0.86Fe'"0.04Ti0.01Al0.16Si1.91O6
G = -318568.51 (J)  H = -253508.70 (J)  S = 50.70 (J/K)  V = 6.68 (cc)  Cp = 26.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.96 | 77.22 | 80.27 | 5.61 | -4.55 | 8.37 | 2.04 |

clinopyroxene  mass = 0.07 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.72Fe"0.42Mg0.62Fe'"0.06Ti0.03Al0.23Si1.85O6
G = -1043.86 (J)  H = -846.13 (J)  S = 0.15 (J/K)  V = 0.02 (cc)  Cp = 0.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.66 | 21.73 | 41.60 | 8.32 | -2.44 | 8.85 | 6.27 |

feldspar  mass = 17.53 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -291260.45 (J)  H = -238475.40 (J)  S = 41.14 (J/K)  V = 6.70 (cc)  Cp = 21.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.67 | 30.18 | 5.15 |

Total solids  mass = 40.72 (gm)  density = 3.04 (gm/cc)
G = -610872.81 (J)  H = -492830.24 (J)  S = 91.99 (J/K)  V = 13.39 (cc)  Cp = 47.94 (J/K)

Viscosity of the System: 6.83 (log 10 poise)

System  mass = 99.94 (gm)  density = 2.69 (gm/cc)
G = -1570348.17 (J)  H = -1256024.10 (J)  S = 244.96 (J/K)  V = 37.19 (cc)  Cp = 127.40 (J/K)

Oxygen  delta moles = -0.0019154  delta grams = -0.0612906
G = 557.62 (J)  H = -62.68 (J)  S = -0.48 (J/K)  V = -204.34 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 1000.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = -0.00  COH = 1.58
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 57.22 (gm)  density = 2.49 (gm/cc)  viscosity = 5.82 (log 10 poise)  (analysis in wt %)
G = -926659.44 (J)  H = -739086.51 (J)  S = 147.33 (J/K)  V = 23.02 (cc)  Cp = 76.67 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.32 1.32 13.67 0.49 0.00 2.12 0.16 0.42 0.00 0.00 3.10 3.29 4.05 0.30 1.76 0.00 0.00 0.00 0.00

clinopyroxene mass = 23.08 (gm) density = 3.47 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.82Mg0.85Fe'"0.04Ti0.01Al0.16Si1.91O6
G = -316604.05 (J) H = -252458.14 (J) S = 50.38 (J/K) V = 6.65 (cc) Cp = 26.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.87 | 77.90 | 81.75 | 5.52 | -4.46 | 8.16 | 2.00 |

clinopyroxene mass = 0.62 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.73Fe"0.42Mg0.61Fe'"0.06Ti0.03Al0.23Si1.85O6
G = -9086.60 (J) H = -7384.07 (J) S = 1.34 (J/K) V = 0.18 (cc) Cp = 0.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.26 | 20.88 | 41.51 | 8.58 | -2.12 | 8.50 | 6.40 |

feldspar mass = 19.02 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.65Ca0.29Al1.29Si2.71O8
G = -315508.93 (J) H = -258895.28 (J) S = 44.47 (J/K) V = 7.27 (cc) Cp = 23.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.23 | 29.40 | 5.37 |

Total solids mass = 42.72 (gm) density = 3.03 (gm/cc)
G = -641199.58 (J) H = -518737.49 (J) S = 96.19 (J/K) V = 14.10 (cc) Cp = 50.26 (J/K)

Viscosity of the System: 7.06 (log 10 poise)

System mass = 99.94 (gm) density = 2.69 (gm/cc)
G = -1567859.02 (J) H = -1257824.00 (J) S = 243.52 (J/K) V = 37.13 (cc) Cp = 126.93 (J/K)

Oxygen delta moles = -0.00200213 delta grams = -0.0640657
G = 577.81 (J) H = -64.80 (J) S = -0.50 (J/K) V = -211.93 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 55.44 (gm) density = 2.48 (gm/cc) viscosity = 5.90 (log 10 poise) (analysis in wt %)
G = -896924.61 (J) H = -717216.95 (J) S = 142.27 (J/K) V = 22.33 (cc) Cp = 74.17 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.62 1.34 13.53 0.47 0.00 2.04 0.16 0.38 0.00 0.00 3.01 3.18 4.14 0.31 1.82 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.76 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.06Fe"0.88Mg0.99Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -91902.50 (J) H = -73444.80 (J) S = 14.61 (J/K) V = 1.93 (cc) Cp = 7.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.37 | 93.89 | 88.01 | 4.64 | -4.24 | 6.59 | 0.48 |

clinopyroxene mass = 14.48 (gm) density = 3.48 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.85Mg0.83Fe'"0.04Ti0.01Al0.16Si1.91O6
G = -196777.05 (J) H = -157089.32 (J) S = 31.42 (J/K) V = 4.16 (cc) Cp = 16.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.79 | 78.53 | 85.09 | 5.46 | -4.42 | 8.16 | 1.97 |

clinopyroxene mass = 2.79 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.73Fe"0.43Mg0.59Fe'"0.07Ti0.04Al0.24Si1.85O6
G = -40751.41 (J) H = -33179.49 (J) S = 5.99 (J/K) V = 0.82 (cc) Cp = 3.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.33 | 20.10 | 42.59 | 8.81 | -1.76 | 8.35 | 6.58 |

feldspar mass = 20.47 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.66Ca0.29Al1.29Si2.71O8
G = -339043.07 (J) H = -278820.81 (J) S = 47.68 (J/K) V = 7.82 (cc) Cp = 25.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.65 | 28.76 | 5.59 |

Total solids mass = 44.50 (gm) density = 3.02 (gm/cc)
G = -668474.04 (J) H = -542534.43 (J) S = 99.70 (J/K) V = 14.73 (cc) Cp = 52.40 (J/K)

Viscosity of the System: 7.28 (log 10 poise)

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1565398.65 (J) H = -1259751.38 (J) S = 241.97 (J/K) V = 37.07 (cc) Cp = 126.57 (J/K)

Oxygen delta moles = -0.00206306 delta grams = -0.0660154
G = 590.20 (J) H = -66.03 (J) S = -0.52 (J/K) V = -216.67 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: intermediate

T = 980.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = -0.02 COH = 1.53 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 53.79 (gm) density = 2.48 (gm/cc) viscosity = 5.99 (log 10 poise) (analysis in wt %)
G = -869243.77 (J) H = -696870.37 (J) S = 137.55 (J/K) V = 21.69 (cc) Cp = 71.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.91 | 1.34 | 13.39 | 0.46 | 0.00 | 1.98 | 0.17 | 0.34 | 0.00 | 0.00 | 2.93 | 3.07 | 4.23 | 0.32 | 1.87 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.92 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.92Mg0.95Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -200853.83 (J) H = -160678.10 (J) S = 32.06 (J/K) V = 4.24 (cc) Cp = 17.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.56 | 94.18 | 91.78 | 4.71 | -4.31 | 6.74 | 0.46 |

clinopyroxene mass = 4.27 (gm) density = 3.50 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.89Mg0.80Fe'"0.04Ti0.01Al0.16Si1.91O6
G = -57425.33 (J) H = -45888.36 (J) S = 9.21 (J/K) V = 1.22 (cc) Cp = 4.81 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-79.12 79.13 88.84 5.40 -4.38 8.20 1.94

clinopyroxene mass = 5.13 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.74Fe"0.44Mg0.57Fe'''0.07Ti0.04Al0.24Si1.84O6
G = -74532.88 (J) H = -60793.36 (J) S = 10.96 (J/K) V = 1.51 (cc) Cp = 5.76 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
14.07 19.35 43.93 9.04 -1.39 8.24 6.76

feldspar mass = 21.82 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.66Ca0.28Al1.28Si2.72O8
G = -360902.20 (J) H = -297453.15 (J) S = 50.63 (J/K) V = 8.34 (cc) Cp = 26.67 (J/K)
albite anorthite sanidine
66.03 28.16 5.81

Total solids mass = 46.15 (gm) density = 3.01 (gm/cc)
G = -693714.23 (J) H = -564812.97 (J) S = 102.86 (J/K) V = 15.31 (cc) Cp = 54.41 (J/K)

Viscosity of the System: 7.51 (log 10 poise)

System mass = 99.93 (gm) density = 2.70 (gm/cc)
G = -1562958.01 (J) H = -1261683.34 (J) S = 240.41 (J/K) V = 37.00 (cc) Cp = 126.26 (J/K)

Oxygen delta moles = -0.00211641 delta grams = -0.0677226
G = 600.13 (J) H = -66.98 (J) S = -0.53 (J/K) V = -220.51 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 970.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = -0.03 COH = 1.50 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 51.67 (gm) density = 2.48 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -834387.76 (J) H = -670561.60 (J) S = 131.78 (J/K) V = 20.86 (cc) Cp = 68.95 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
70.07 1.35 13.33 0.44 0.00 1.87 0.18 0.31 0.00 0.00 2.85 2.97 4.36 0.33 1.95 0.00 0.00 0.00 0.00

orthopyroxene mass = 18.48 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.94Mg0.93Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -247116.83 (J) H = -198033.30 (J) S = 39.48 (J/K) V = 5.24 (cc) Cp = 21.20 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-96.03 94.41 93.97 4.75 -4.35 6.79 0.45

clinopyroxene mass = 6.27 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.75Fe"0.44Mg0.55Fe'''0.07Ti0.04Al0.24Si1.83O6
G = -90756.69 (J) H = -74200.43 (J) S = 13.32 (J/K) V = 1.84 (cc) Cp = 7.02 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
14.15 18.24 44.09 9.58 -0.97 7.96 6.95

feldspar mass = 23.15 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.06Na0.66Ca0.28Al1.28Si2.72O8
G = -382193.18 (J) H = -315693.39 (J) S = 53.49 (J/K) V = 8.85 (cc) Cp = 28.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.37 | 27.54 | 6.09 |

quartz mass = 0.37 (gm) density = 2.56 (gm/cc)
SiO2
G = -6077.73 (J) H = -5077.93 (J) S = 0.80 (J/K) V = 0.14 (cc) Cp = 0.44 (J/K)

Total solids mass = 48.26 (gm) density = 3.00 (gm/cc)
G = -726144.43 (J) H = -593005.06 (J) S = 107.10 (J/K) V = 16.07 (cc) Cp = 56.91 (J/K)

Viscosity of the System: 7.82 (log 10 poise)

System mass = 99.93 (gm) density = 2.71 (gm/cc)
G = -1560532.18 (J) H = -1263566.66 (J) S = 238.88 (J/K) V = 36.93 (cc) Cp = 125.86 (J/K)

Oxygen delta moles = -0.00217094 delta grams = -0.0694675
G = 610.14 (J) H = -67.93 (J) S = -0.55 (J/K) V = -224.39 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 960.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = -0.04 COH = 1.47 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 48.45 (gm) density = 2.47 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -782446.36 (J) H = -630195.84 (J) S = 123.46 (J/K) V = 19.62 (cc) Cp = 64.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.12 | 1.21 | 13.41 | 0.41 | 0.00 | 1.72 | 0.18 | 0.29 | 0.00 | 0.00 | 2.75 | 2.91 | 4.57 | 0.35 | 2.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.40 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.93Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -245333.49 (J) H = -197095.09 (J) S = 39.12 (J/K) V = 5.21 (cc) Cp = 21.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.64 | 94.55 | 94.51 | 4.76 | -4.40 | 6.77 | 0.45 |

clinopyroxene mass = 6.66 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.75Fe"0.44Mg0.55Fe'"0.07Ti0.04Al0.24Si1.84O6
G = -96433.07 (J) H = -79048.55 (J) S = 14.10 (J/K) V = 1.96 (cc) Cp = 7.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.19 | 17.86 | 43.90 | 9.22 | -1.17 | 7.98 | 7.02 |

feldspar mass = 24.74 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.66Ca0.27Al1.27Si2.73O8
G = -407753.07 (J) H = -337545.00 (J) S = 56.93 (J/K) V = 9.46 (cc) Cp = 30.17 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.40 | 27.03 | 6.56 |

quartz mass = 1.44 (gm) density = 2.56 (gm/cc)

SiO2
G = -23728.71 (J)  H = -19868.52 (J)  S = 3.13 (J/K)  V = 0.56 (cc)  Cp = 1.70 (J/K)

rhm-oxide  mass = 0.24 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'''0.17Al0.13Ti0.85O3
G = -2447.56 (J)  H = -1861.38 (J)  S = 0.48 (J/K)  V = 0.05 (cc)  Cp = 0.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.21 | 8.58 | 71.05 | 2.76 | 6.40 |

Total solids  mass = 51.48 (gm)  density = 2.99 (gm/cc)
G = -775695.90 (J)  H = -635418.54 (J)  S = 113.76 (J/K)  V = 17.24 (cc)  Cp = 60.63 (J/K)

Viscosity of the System: 8.45 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.71 (gm/cc)
G = -1558142.26 (J)  H = -1265614.39 (J)  S = 237.22 (J/K)  V = 36.86 (cc)  Cp = 125.30 (J/K)

Oxygen  delta moles = -0.0021892  delta grams = -0.0700519
G = 609.78 (J)  H = -67.72 (J)  S = -0.55 (J/K)  V = -224.45 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 950.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = -0.05  COH = 1.45  IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 45.72 (gm)  density = 2.47 (gm/cc)  viscosity = 6.09 (log 10 poise)  (analysis in wt %)
G = -737972.68 (J)  H = -595655.37 (J)  S = 116.35 (J/K)  V = 18.55 (cc)  Cp = 61.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.09 | 1.15 | 13.49 | 0.38 | 0.00 | 1.59 | 0.19 | 0.27 | 0.00 | 0.00 | 2.67 | 2.84 | 4.76 | 0.37 | 2.20 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.40 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.95Mg0.92Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -244697.95 (J)  H = -197064.47 (J)  S = 38.94 (J/K)  V = 5.21 (cc)  Cp = 21.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.43 | 94.72 | 95.16 | 4.80 | -4.45 | 6.76 | 0.44 |

clinopyroxene  mass = 7.01 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.76Fe"0.43Mg0.55Fe'''0.07Ti0.04Al0.24Si1.84O6
G = -101350.18 (J)  H = -83301.29 (J)  S = 14.76 (J/K)  V = 2.06 (cc)  Cp = 7.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.20 | 17.11 | 43.45 | 9.35 | -1.12 | 7.85 | 7.15 |

feldspar  mass = 26.10 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.07Na0.66Ca0.26Al1.26Si2.74O8
G = -429466.90 (J)  H = -356298.29 (J)  S = 59.82 (J/K)  V = 9.98 (cc)  Cp = 31.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.49 | 26.49 | 7.02 |

quartz  mass = 2.34 (gm)  density = 2.56 (gm/cc)

SiO2
G = -38602.98 (J)  H = -32393.32 (J)  S = 5.08 (J/K)  V = 0.91 (cc)  Cp = 2.77 (J/K)

rhm-oxide  mass = 0.36 (gm)  density = 4.60 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'''0.17Al0.13Ti0.85O3
G = -3670.53 (J)  H = -2800.19 (J)  S = 0.71 (J/K)  V = 0.08 (cc)  Cp = 0.35 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.07 | 8.46 | 71.27 | 2.89 | 6.31 |

Total solids  mass = 54.21 (gm)  density = 2.97 (gm/cc)
G = -817788.54 (J)  H = -671857.56 (J)  S = 119.31 (J/K)  V = 18.24 (cc)  Cp = 63.80 (J/K)

Viscosity of the System: 10.24 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.72 (gm/cc)
G = -1555761.22 (J)  H = -1267512.93 (J)  S = 235.66 (J/K)  V = 36.78 (cc)  Cp = 124.81 (J/K)

Oxygen  delta moles = -0.00222027  delta grams = -0.0710461
G = 612.86 (J)  H = -67.88 (J)  S = -0.56 (J/K)  V = -225.79 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 940.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = -0.06  COH = 1.42
IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 43.22 (gm)  density = 2.46 (gm/cc)  viscosity = 6.10 (log 10 poise)  (analysis in wt %)
G = -697381.47 (J)  H = -564092.42 (J)  S = 109.87 (J/K)  V = 17.57 (cc)  Cp = 57.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.04 | 1.08 | 13.58 | 0.36 | 0.00 | 1.46 | 0.19 | 0.25 | 0.00 | 0.00 | 2.59 | 2.76 | 4.95 | 0.40 | 2.33 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.41 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.92Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -244070.63 (J)  H = -197043.06 (J)  S = 38.76 (J/K)  V = 5.20 (cc)  Cp = 21.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.19 | 94.89 | 95.76 | 4.85 | -4.51 | 6.77 | 0.43 |

clinopyroxene  mass = 7.32 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.76Fe"0.43Mg0.54Fe'''0.07Ti0.04Al0.24Si1.84O6
G = -105779.01 (J)  H = -87173.28 (J)  S = 15.34 (J/K)  V = 2.15 (cc)  Cp = 8.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.18 | 16.40 | 43.00 | 9.49 | -1.08 | 7.72 | 7.28 |

feldspar  mass = 27.35 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.07Na0.67Ca0.26Al1.26Si2.74O8
G = -449311.85 (J)  H = -373577.53 (J)  S = 62.43 (J/K)  V = 10.46 (cc)  Cp = 33.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.54 | 25.97 | 7.49 |

quartz  mass = 3.16 (gm)  density = 2.56 (gm/cc)

SiO2
G = -52134.93 (J)  H = -43843.39 (J)  S = 6.83 (J/K)  V = 1.24 (cc)  Cp = 3.74 (J/K)

rhm-oxide  mass = 0.47 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.71Mg0.11Fe'''0.17Al0.12Ti0.85O3
G = -4717.34 (J)  H = -3610.11 (J)  S = 0.91 (J/K)  V = 0.10 (cc)  Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.94 | 8.32 | 71.49 | 3.02 | 6.23 |

Total solids  mass = 56.71 (gm)  density = 2.96 (gm/cc)
G = -856013.76 (J)  H = -705247.38 (J)  S = 124.28 (J/K)  V = 19.15 (cc)  Cp = 66.68 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.72 (gm/cc)
G = -1553395.23 (J)  H = -1269339.80 (J)  S = 234.15 (J/K)  V = 36.72 (cc)  Cp = 124.37 (J/K)

Oxygen  delta moles = -0.00225197  delta grams = -0.0720603
G = 615.97 (J)  H = -68.05 (J)  S = -0.56 (J/K)  V = -227.14 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 930.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.36  delta HM = -5.02  NNO = 0.00  QFM = -0.07  COH = 1.39  IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid  mass = 40.93 (gm)  density = 2.46 (gm/cc)  viscosity = 6.11 (log 10 poise)  (analysis in wt %)
G = -660116.08 (J)  H = -535076.69 (J)  S = 103.93 (J/K)  V = 16.67 (cc)  Cp = 54.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.97 | 1.02 | 13.67 | 0.33 | 0.00 | 1.35 | 0.20 | 0.24 | 0.00 | 0.00 | 2.52 | 2.69 | 5.13 | 0.42 | 2.46 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.41 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.96Mg0.91Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -243450.72 (J)  H = -197029.50 (J)  S = 38.58 (J/K)  V = 5.20 (cc)  Cp = 21.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.90 | 95.06 | 96.31 | 4.90 | -4.58 | 6.77 | 0.43 |

clinopyroxene  mass = 7.60 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.77Fe"0.43Mg0.54Fe'''0.07Ti0.04Al0.25Si1.84O6
G = -109794.92 (J)  H = -90723.48 (J)  S = 15.85 (J/K)  V = 2.23 (cc)  Cp = 8.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.14 | 15.73 | 42.53 | 9.66 | -1.05 | 7.59 | 7.41 |

feldspar  mass = 28.51 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -467547.27 (J)  H = -389588.69 (J)  S = 64.80 (J/K)  V = 10.90 (cc)  Cp = 34.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.56 | 25.47 | 7.97 |

quartz  mass = 3.92 (gm)  density = 2.56 (gm/cc)

SiO2
G = -64519.28 (J)  H = -54375.49 (J)  S = 8.43 (J/K)  V = 1.53 (cc)  Cp = 4.63 (J/K)

rhm-oxide  mass = 0.56 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'''0.16Al0.12Ti0.86O3
G = -5615.72 (J)  H = -4311.20 (J)  S = 1.08 (J/K)  V = 0.12 (cc)  Cp = 0.53 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.82 | 8.19 | 71.70 | 3.14 | 6.15 |

Total solids  mass = 59.00 (gm)  density = 2.95 (gm/cc)
G = -890927.91 (J)  H = -736028.37 (J)  S = 128.74 (J/K)  V = 19.99 (cc)  Cp = 69.31 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.73 (gm/cc)
G = -1551043.99 (J)  H = -1271105.06 (J)  S = 232.67 (J/K)  V = 36.65 (cc)  Cp = 123.95 (J/K)

Oxygen  delta moles = -0.00228407  delta grams = -0.0730875
G = 619.03 (J)  H = -68.21 (J)  S = -0.57 (J/K)  V = -228.48 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 920.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = -0.08  COH = 1.36  IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 38.82 (gm)  density = 2.45 (gm/cc)  viscosity = 6.12 (log 10 poise)  (analysis in wt %)
G = -625712.33 (J)  H = -508248.96 (J)  S = 98.45 (J/K)  V = 15.83 (cc)  Cp = 51.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.88 | 0.97 | 13.76 | 0.31 | 0.00 | 1.25 | 0.21 | 0.22 | 0.00 | 0.00 | 2.45 | 2.61 | 5.30 | 0.44 | 2.60 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.41 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.91Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -242839.99 (J)  H = -197024.65 (J)  S = 38.40 (J/K)  V = 5.19 (cc)  Cp = 20.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.58 | 95.23 | 96.84 | 4.96 | -4.65 | 6.79 | 0.42 |

clinopyroxene  mass = 7.85 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.77Fe"0.42Mg0.54Fe'''0.06Ti0.04Al0.25Si1.84O6
G = -113458.71 (J)  H = -93999.49 (J)  S = 16.31 (J/K)  V = 2.31 (cc)  Cp = 8.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.06 | 15.08 | 42.06 | 9.84 | -1.02 | 7.46 | 7.53 |

feldspar  mass = 29.58 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.67Ca0.25Al1.25Si2.75O8
G = -484390.89 (J)  H = -404504.79 (J)  S = 66.95 (J/K)  V = 11.32 (cc)  Cp = 35.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.54 | 24.98 | 8.48 |

quartz  mass = 4.62 (gm)  density = 2.56 (gm/cc)

SiO2
G = -75917.54 (J)  H = -64119.73 (J)  S = 9.89 (J/K)  V = 1.80 (cc)  Cp = 5.45 (J/K)

rhm-oxide  mass = 0.64 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'''0.16Al0.12Ti0.86O3
G = -6387.78 (J)  H = -4919.43 (J)  S = 1.23 (J/K)  V = 0.14 (cc)  Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.70 | 8.05 | 71.91 | 3.25 | 6.08 |

Total solids  mass = 61.11 (gm)  density = 2.94 (gm/cc)
G = -922994.91 (J)  H = -764568.10 (J)  S = 132.78 (J/K)  V = 20.76 (cc)  Cp = 71.73 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 2.73 (gm/cc)
G = -1548707.24 (J)  H = -1272817.06 (J)  S = 231.23 (J/K)  V = 36.59 (cc)  Cp = 123.56 (J/K)

Oxygen  delta moles = -0.00231641  delta grams = -0.0741223
G = 622.01 (J)  H = -68.35 (J)  S = -0.58 (J/K)  V = -229.79 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 910.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = -0.09  COH = 1.34
IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid  mass = 36.86 (gm)  density = 2.45 (gm/cc)  viscosity = 6.12 (log 10 poise)  (analysis in wt %)
G = -593778.92 (J)  H = -483306.01 (J)  S = 93.37 (J/K)  V = 15.06 (cc)  Cp = 49.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.77 | 0.91 | 13.86 | 0.29 | 0.00 | 1.15 | 0.21 | 0.21 | 0.00 | 0.00 | 2.39 | 2.54 | 5.46 | 0.46 | 2.73 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.41 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.91Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -242241.80 (J)  H = -197030.78 (J)  S = 38.21 (J/K)  V = 5.19 (cc)  Cp = 20.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.24 | 95.39 | 97.33 | 5.02 | -4.72 | 6.81 | 0.41 |

clinopyroxene  mass = 8.09 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.78Fe"0.42Mg0.53Fe'''0.06Ti0.05Al0.25Si1.84O6
G = -116820.15 (J)  H = -97040.25 (J)  S = 16.72 (J/K)  V = 2.38 (cc)  Cp = 9.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.96 | 14.46 | 41.57 | 10.04 | -1.01 | 7.34 | 7.64 |

feldspar  mass = 30.59 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.09Na0.66Ca0.25Al1.25Si2.75O8
G = -500027.52 (J)  H = -418472.87 (J)  S = 68.93 (J/K)  V = 11.70 (cc)  Cp = 37.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.49 | 24.51 | 9.00 |

quartz  mass = 5.27 (gm)  density = 2.56 (gm/cc)

SiO2
G = -86465.14 (J)  H = -73185.30 (J)  S = 11.22 (J/K)  V = 2.06 (cc)  Cp = 6.21 (J/K)

rhm-oxide  mass = 0.71 (gm)  density = 4.61 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.11Fe'"0.16Al0.12Ti0.86O3
G = -7051.22 (J)  H = -5447.56 (J)  S = 1.36 (J/K)  V = 0.15 (cc)  Cp = 0.67 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.59 | 7.91 | 72.12 | 3.37 | 6.01 |

Total solids  mass = 63.07 (gm)  density = 2.94 (gm/cc)
G = -952605.82 (J)  H = -791176.76 (J)  S = 136.44 (J/K)  V = 21.48 (cc)  Cp = 73.97 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.73 (gm/cc)
G = -1546384.75 (J)  H = -1274482.78 (J)  S = 229.81 (J/K)  V = 36.54 (cc)  Cp = 123.20 (J/K)

Oxygen  delta moles = -0.00234886  delta grams = -0.0751607
G = 624.86 (J)  H = -68.47 (J)  S = -0.59 (J/K)  V = -231.06 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: intermediate

T = 900.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = -0.10  COH = 1.31
IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid  mass = 34.98 (gm)  density = 2.44 (gm/cc)  viscosity = 6.12 (log 10 poise)  (analysis in wt %)
G = -563173.99 (J)  H = -459296.18 (J)  S = 88.55 (J/K)  V = 14.32 (cc)  Cp = 46.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.72 | 0.86 | 13.89 | 0.27 | 0.00 | 1.05 | 0.22 | 0.20 | 0.00 | 0.00 | 2.31 | 2.51 | 5.62 | 0.47 | 2.88 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 0.71 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.58Mg0.25)3Al2Si3O12
G = -9749.84 (J)  H = -8072.92 (J)  S = 1.43 (J/K)  V = 0.18 (cc)  Cp = 0.78 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.54 | 17.57 | 24.89 |

orthopyroxene  mass = 17.92 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.97Mg0.91Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -235468.59 (J)  H = -192046.75 (J)  S = 37.01 (J/K)  V = 5.05 (cc)  Cp = 20.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.16 | 95.53 | 97.23 | 5.00 | -4.71 | 6.70 | 0.41 |

clinopyroxene  mass = 8.33 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.78Fe"0.41Mg0.54Fe'"0.06Ti0.05Al0.25Si1.84O6
G = -120302.32 (J)  H = -100209.06 (J)  S = 17.13 (J/K)  V = 2.45 (cc)  Cp = 9.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.31 | 13.84 | 40.80 | 10.12 | -0.93 | 7.08 | 7.78 |

feldspar  mass = 31.22 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)

K0.10Na0.67Ca0.24Al1.24Si2.76O8
G = -509423.68 (J) H = -427239.15 (J) S = 70.05 (J/K) V = 11.95 (cc) Cp = 37.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.66 | 23.62 | 9.72 |

quartz mass = 5.98 (gm) density = 2.56 (gm/cc)
SiO2
G = -98103.01 (J) H = -83213.91 (J) S = 12.69 (J/K) V = 2.34 (cc) Cp = 7.04 (J/K)

rhm-oxide mass = 0.77 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.11Fe'"0.15Al0.12Ti0.86O3
G = -7647.62 (J) H = -5927.61 (J) S = 1.47 (J/K) V = 0.17 (cc) Cp = 0.73 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.58 | 7.72 | 72.29 | 3.51 | 5.90 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -194.46 (J) H = -161.31 (J) S = 0.03 (J/K) V = 0.00 (cc) Cp = 0.02 (J/K)

Total solids mass = 64.94 (gm) density = 2.93 (gm/cc)
G = -980889.51 (J) H = -816870.70 (J) S = 139.81 (J/K) V = 22.14 (cc) Cp = 76.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.74 (gm/cc)
G = -1544063.50 (J) H = -1276166.89 (J) S = 228.36 (J/K) V = 36.45 (cc) Cp = 122.80 (J/K)

Oxygen delta moles = -0.00240575 delta grams = -0.0769813
G = 634.00 (J) H = -69.27 (J) S = -0.60 (J/K) V = -234.66 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 33.14 (gm) density = 2.44 (gm/cc) viscosity = 6.10 (log 10 poise) (analysis in wt %)
G = -533194.78 (J) H = -435642.22 (J) S = 83.87 (J/K) V = 13.59 (cc) Cp = 44.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.74 | 0.81 | 13.82 | 0.25 | 0.00 | 0.95 | 0.23 | 0.19 | 0.00 | 0.00 | 2.22 | 2.53 | 5.75 | 0.47 | 3.04 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.26 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.25)3Al2Si3O12
G = -30805.03 (J) H = -25568.80 (J) S = 4.50 (J/K) V = 0.58 (cc) Cp = 2.46 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.52 | 17.52 | 24.96 |

orthopyroxene mass = 16.84 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.96Mg0.92Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -221434.95 (J) H = -181148.37 (J) S = 34.64 (J/K) V = 4.75 (cc) Cp = 19.17 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-99.15 95.61 96.41 4.86 -4.59 6.44 0.41

clinopyroxene mass = 8.58 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.40Mg0.54Fe'"0.06Ti0.05Al0.25Si1.84O6
G = -124104.77 (J) H = -103676.92 (J) S = 17.56 (J/K) V = 2.52 (cc) Cp = 9.55 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
23.21 13.24 39.67 10.03 -0.78 6.66 7.96

feldspar mass = 31.46 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.67Ca0.22Al1.22Si2.78O8
G = -512265.13 (J) H = -430498.19 (J) S = 70.30 (J/K) V = 12.05 (cc) Cp = 38.11 (J/K)
albite anorthite sanidine
67.06 22.21 10.73

quartz mass = 6.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -111245.48 (J) H = -94563.63 (J) S = 14.34 (J/K) V = 2.65 (cc) Cp = 7.99 (J/K)

rhm-oxide mass = 0.83 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.11Fe'"0.15Al0.11Ti0.87O3
G = -8200.82 (J) H = -6377.84 (J) S = 1.57 (J/K) V = 0.18 (cc) Cp = 0.78 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.71 7.49 72.40 3.67 5.74

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -492.57 (J) H = -409.58 (J) S = 0.07 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 66.79 (gm) density = 2.94 (gm/cc)
G = -1008548.76 (J) H = -842243.34 (J) S = 142.98 (J/K) V = 22.74 (cc) Cp = 78.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.75 (gm/cc)
G = -1541743.54 (J) H = -1277885.56 (J) S = 226.85 (J/K) V = 36.34 (cc) Cp = 122.36 (J/K)

Oxygen delta moles = -0.00248857 delta grams = -0.0796314
G = 649.62 (J) H = -70.77 (J) S = -0.62 (J/K) V = -240.66 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 31.35 (gm) density = 2.43 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -504144.40 (J) H = -412632.16 (J) S = 79.36 (J/K) V = 12.89 (cc) Cp = 41.88 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
69.73 0.76 13.75 0.23 0.00 0.87 0.24 0.18 0.00 0.00 2.13 2.57 5.85 0.48 3.21 0.00 0.00 0.00 0.00

garnet mass = 3.73 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.25)3Al2Si3O12
G = -50815.99 (J) H = -42280.76 (J) S = 7.40 (J/K) V = 0.95 (cc) Cp = 4.06 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.49 | 17.46 | 25.05 |

orthopyroxene mass = 15.80 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.96Mg0.93Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -207968.57 (J) H = -170647.03 (J) S = 32.36 (J/K) V = 4.46 (cc) Cp = 18.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.11 | 95.70 | 95.54 | 4.73 | -4.47 | 6.19 | 0.42 |

clinopyroxene mass = 8.82 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.39Mg0.55Fe'"0.06Ti0.05Al0.24Si1.84O6
G = -127786.58 (J) H = -107060.73 (J) S = 17.97 (J/K) V = 2.60 (cc) Cp = 9.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.09 | 12.68 | 38.54 | 9.94 | -0.63 | 6.25 | 8.13 |

feldspar mass = 31.72 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.12Na0.67Ca0.21Al1.21Si2.79O8
G = -515515.63 (J) H = -434111.04 (J) S = 70.59 (J/K) V = 12.17 (cc) Cp = 38.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.33 | 20.80 | 11.87 |

quartz mass = 7.57 (gm) density = 2.56 (gm/cc)
SiO2
G = -123757.07 (J) H = -105423.47 (J) S = 15.90 (J/K) V = 2.96 (cc) Cp = 8.89 (J/K)

rhm-oxide mass = 0.88 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.11Fe'"0.15Al0.11Ti0.87O3
G = -8694.54 (J) H = -6784.57 (J) S = 1.66 (J/K) V = 0.19 (cc) Cp = 0.82 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.84 | 7.26 | 72.50 | 3.83 | 5.58 |

apatite mass = 0.05 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -758.83 (J) H = -632.48 (J) S = 0.11 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

Total solids mass = 68.57 (gm) density = 2.94 (gm/cc)
G = -1035297.21 (J) H = -866940.07 (J) S = 146.00 (J/K) V = 23.34 (cc) Cp = 80.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.76 (gm/cc)
G = -1539441.61 (J) H = -1279572.23 (J) S = 225.36 (J/K) V = 36.22 (cc) Cp = 121.94 (J/K)

Oxygen delta moles = -0.00256577 delta grams = -0.0821017
G = 663.40 (J) H = -72.06 (J) S = -0.64 (J/K) V = -246.00 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 870.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.13 COH = 1.22

IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 29.59 (gm) density = 2.43 (gm/cc) viscosity = 6.03 (log 10 poise) (analysis in wt %)
G = -475650.56 (J) H = -389962.13 (J) S = 74.96 (J/K) V = 12.19 (cc) Cp = 39.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.70 | 0.71 | 13.67 | 0.21 | 0.00 | 0.79 | 0.25 | 0.18 | 0.00 | 0.00 | 2.06 | 2.61 | 5.93 | 0.48 | 3.40 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.15 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.25)3Al2Si3O12
G = -70022.85 (J) H = -58402.91 (J) S = 10.16 (J/K) V = 1.31 (cc) Cp = 5.59 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.45 | 17.40 | 25.15 |

orthopyroxene mass = 14.80 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.95Mg0.95Fe'"0.02Ti0.00Al0.11Si1.94O6
G = -194924.73 (J) H = -160428.13 (J) S = 30.18 (J/K) V = 4.18 (cc) Cp = 16.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.03 | 95.79 | 94.63 | 4.60 | -4.35 | 5.94 | 0.42 |

clinopyroxene mass = 9.05 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.37Mg0.56Fe'"0.05Ti0.05Al0.24Si1.85O6
G = -131386.69 (J) H = -110392.50 (J) S = 18.37 (J/K) V = 2.67 (cc) Cp = 10.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.94 | 12.14 | 37.40 | 9.86 | -0.49 | 5.85 | 8.30 |

feldspar mass = 32.02 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.67Ca0.19Al1.19Si2.81O8
G = -519240.20 (J) H = -438134.24 (J) S = 70.95 (J/K) V = 12.29 (cc) Cp = 38.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.45 | 19.38 | 13.17 |

quartz mass = 8.32 (gm) density = 2.56 (gm/cc)
SiO2
G = -135795.24 (J) H = -115924.37 (J) S = 17.38 (J/K) V = 3.25 (cc) Cp = 9.76 (J/K)

rhm-oxide mass = 0.92 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.14Al0.11Ti0.88O3
G = -9137.79 (J) H = -7154.40 (J) S = 1.74 (J/K) V = 0.20 (cc) Cp = 0.86 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.97 | 7.04 | 72.58 | 3.98 | 5.43 |

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -999.15 (J) H = -834.76 (J) S = 0.14 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 70.32 (gm) density = 2.94 (gm/cc)
G = -1061506.66 (J) H = -891271.30 (J) S = 148.92 (J/K) V = 23.92 (cc) Cp = 81.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.77 (gm/cc)
G = -1537157.22 (J) H = -1281233.43 (J) S = 223.88 (J/K) V = 36.11 (cc) Cp = 121.53 (J/K)

Oxygen delta moles = -0.00263802 delta grams = -0.0844133
G = 675.52 (J) H = -73.15 (J) S = -0.65 (J/K) V = -250.73 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: intermediate

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 27.66 (gm) density = 2.42 (gm/cc) viscosity = 5.95 (log 10 poise) (analysis in wt %)
G = -444448.49 (J) H = -364901.03 (J) S = 70.20 (J/K) V = 11.43 (cc) Cp = 37.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.67 | 0.66 | 13.57 | 0.20 | 0.00 | 0.73 | 0.26 | 0.17 | 0.00 | 0.00 | 2.00 | 2.70 | 5.93 | 0.49 | 3.64 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.57 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.25)3Al2Si3O12
G = -89190.78 (J) H = -74570.84 (J) S = 12.90 (J/K) V = 1.67 (cc) Cp = 7.13 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.39 | 17.33 | 25.29 |

orthopyroxene mass = 13.79 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.94Mg0.96Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -181873.83 (J) H = -150143.92 (J) S = 28.00 (J/K) V = 3.90 (cc) Cp = 15.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.83 | 95.87 | 93.60 | 4.47 | -4.23 | 5.70 | 0.42 |

clinopyroxene mass = 9.27 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.36Mg0.57Fe'"0.05Ti0.05Al0.24Si1.85O6
G = -134804.85 (J) H = -113588.92 (J) S = 18.72 (J/K) V = 2.73 (cc) Cp = 10.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.80 | 11.62 | 36.21 | 9.79 | -0.35 | 5.46 | 8.48 |

feldspar mass = 31.81 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.68Ca0.18Al1.18Si2.82O8
G = -514929.88 (J) H = -435399.41 (J) S = 70.19 (J/K) V = 12.23 (cc) Cp = 38.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.71 | 18.20 | 14.09 |

feldspar mass = 0.66 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.03Al1.03Si2.97O8
G = -10476.39 (J) H = -8840.60 (J) S = 1.44 (J/K) V = 0.26 (cc) Cp = 0.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.18 | 3.02 | 60.79 |

quartz mass = 9.09 (gm) density = 2.56 (gm/cc)
SiO2
G = -148328.41 (J) H = -126892.14 (J) S = 18.92 (J/K) V = 3.55 (cc) Cp = 10.66 (J/K)

rhm-oxide mass = 0.97 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.14Al0.11Ti0.88O3
G = -9585.84 (J) H = -7530.54 (J) S = 1.81 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.13 | 6.81 | 72.65 | 4.13 | 5.29 |

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1251.25 (J) H = -1047.85 (J) S = 0.18 (J/K) V = 0.03 (cc) Cp = 0.10 (J/K)

Total solids mass = 72.26 (gm) density = 2.94 (gm/cc)
G = -1090441.23 (J) H = -918014.21 (J) S = 152.17 (J/K) V = 24.58 (cc) Cp = 84.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.77 (gm/cc)
G = -1534889.72 (J) H = -1282915.24 (J) S = 222.37 (J/K) V = 36.01 (cc) Cp = 121.10 (J/K)

Oxygen delta moles = -0.00270642 delta grams = -0.0866023
G = 686.32 (J) H = -74.09 (J) S = -0.67 (J/K) V = -254.98 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 25.43 (gm) density = 2.41 (gm/cc) viscosity = 5.82 (log 10 poise) (analysis in wt %)
G = -408820.61 (J) H = -335988.95 (J) S = 64.85 (J/K) V = 10.54 (cc) Cp = 34.08 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.62 | 0.59 | 13.40 | 0.19 | 0.00 | 0.68 | 0.27 | 0.17 | 0.00 | 0.00 | 1.96 | 2.88 | 5.78 | 0.50 | 3.95 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.97 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.25)3Al2Si3O12
G = -108157.62 (J) H = -90648.90 (J) S = 15.59 (J/K) V = 2.03 (cc) Cp = 8.64 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.29 | 17.24 | 25.47 |

orthopyroxene mass = 12.80 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.92Mg0.98Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -169055.93 (J) H = -139992.35 (J) S = 25.88 (J/K) V = 3.62 (cc) Cp = 14.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.51 | 95.95 | 92.44 | 4.34 | -4.11 | 5.47 | 0.43 |

clinopyroxene mass = 9.45 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.35Mg0.58Fe'"0.05Ti0.05Al0.23Si1.85O6
G = -137719.45 (J) H = -116376.73 (J) S = 19.00 (J/K) V = 2.79 (cc) Cp = 10.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.65 | 11.11 | 34.96 | 9.74 | -0.21 | 5.07 | 8.69 |

feldspar mass = 30.48 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.69Ca0.18Al1.18Si2.82O8
G = -492714.56 (J) H = -417531.58 (J) S = 66.94 (J/K) V = 11.71 (cc) Cp = 36.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.55 | 17.62 | 13.83 |

feldspar mass = 2.71 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.03Al1.03Si2.97O8
G = -42686.68 (J) H = -36102.93 (J) S = 5.86 (J/K) V = 1.06 (cc) Cp = 3.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.99 | 2.80 | 61.21 |

quartz mass = 9.94 (gm) density = 2.56 (gm/cc)
SiO2
G = -161885.93 (J) H = -138783.22 (J) S = 20.57 (J/K) V = 3.88 (cc) Cp = 11.64 (J/K)

rhm-oxide mass = 1.02 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.13Al0.10Ti0.88O3
G = -10065.15 (J) H = -7933.94 (J) S = 1.90 (J/K) V = 0.22 (cc) Cp = 0.95 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.30 | 6.57 | 72.70 | 4.26 | 5.16 |

apatite mass = 0.11 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1533.86 (J) H = -1287.55 (J) S = 0.22 (J/K) V = 0.03 (cc) Cp = 0.12 (J/K)

Total solids mass = 74.48 (gm) density = 2.94 (gm/cc)
G = -1123819.19 (J) H = -948657.20 (J) S = 155.96 (J/K) V = 25.36 (cc) Cp = 86.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1532639.80 (J) H = -1284646.15 (J) S = 220.80 (J/K) V = 35.90 (cc) Cp = 120.64 (J/K)

Oxygen delta moles = -0.00277104 delta grams = -0.08867
G = 695.84 (J) H = -74.88 (J) S = -0.69 (J/K) V = -258.77 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 23.41 (gm) density = 2.40 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -376318.69 (J) H = -309558.72 (J) S = 59.97 (J/K) V = 9.73 (cc) Cp = 31.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.53 | 0.54 | 13.23 | 0.18 | 0.00 | 0.64 | 0.29 | 0.17 | 0.00 | 0.00 | 1.92 | 3.07 | 5.62 | 0.51 | 4.29 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.25 (gm) density = 3.93 (gm/cc) (analysis in mole %)

(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -125321.59 (J) H = -105288.50 (J) S = 18.00 (J/K) V = 2.35 (cc) Cp = 10.02 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.21 | 17.14 | 25.64 |

orthopyroxene mass = 11.90 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.91Mg0.99Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -157406.49 (J) H = -130742.00 (J) S = 23.95 (J/K) V = 3.37 (cc) Cp = 13.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.25 | 96.04 | 91.32 | 4.22 | -4.00 | 5.24 | 0.43 |

clinopyroxene mass = 9.62 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.80Fe"0.34Mg0.58Fe'"0.05Ti0.05Al0.23Si1.86O6
G = -140384.90 (J) H = -118963.09 (J) S = 19.24 (J/K) V = 2.84 (cc) Cp = 10.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.42 | 10.63 | 33.76 | 9.68 | -0.08 | 4.69 | 8.89 |

feldspar mass = 29.29 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.69Ca0.17Al1.17Si2.83O8
G = -472940.27 (J) H = -401655.53 (J) S = 64.04 (J/K) V = 11.26 (cc) Cp = 35.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.39 | 17.05 | 13.55 |

feldspar mass = 4.54 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.62Na0.36Ca0.03Al1.03Si2.97O8
G = -71425.23 (J) H = -60545.31 (J) S = 9.77 (J/K) V = 1.78 (cc) Cp = 5.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.75 | 2.59 | 61.66 |

quartz mass = 10.72 (gm) density = 2.56 (gm/cc)
SiO2
G = -174391.21 (J) H = -149819.09 (J) S = 22.07 (J/K) V = 4.19 (cc) Cp = 12.54 (J/K)

rhm-oxide mass = 1.06 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.73Mg0.11Fe'"0.13Al0.10Ti0.89O3
G = -10455.54 (J) H = -8269.35 (J) S = 1.96 (J/K) V = 0.23 (cc) Cp = 0.98 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.47 | 6.35 | 72.76 | 4.39 | 5.03 |

apatite mass = 0.12 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1764.16 (J) H = -1484.34 (J) S = 0.25 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 76.50 (gm) density = 2.93 (gm/cc)
G = -1154089.38 (J) H = -976767.21 (J) S = 159.30 (J/K) V = 26.07 (cc) Cp = 88.80 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1530408.07 (J) H = -1286325.93 (J) S = 219.27 (J/K) V = 35.80 (cc) Cp = 120.22 (J/K)

Oxygen delta moles = -0.00283058 delta grams = -0.0905752
G = 703.79 (J) H = -75.49 (J) S = -0.70 (J/K) V = -261.97 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 830.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -13.24  delta HM = -5.10  NNO = 0.00  QFM = -0.17  COH = 1.09
IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid  mass = 21.54 (gm)  density = 2.40 (gm/cc)  viscosity = 5.51 (log 10 poise)  (analysis in wt %)
G = -346419.94 (J)  H = -285189.78 (J)  S = 55.50 (J/K)  V = 8.99 (cc)  Cp = 28.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.40 | 0.48 | 13.05 | 0.17 | 0.00 | 0.61 | 0.31 | 0.17 | 0.00 | 0.00 | 1.89 | 3.28 | 5.45 | 0.53 | 4.67 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.41 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -140907.95 (J)  H = -118668.03 (J)  S = 20.16 (J/K)  V = 2.65 (cc)  Cp = 11.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.15 | 17.04 | 25.80 |

orthopyroxene  mass = 11.08 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg1.00Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -146775.79 (J)  H = -122278.21 (J)  S = 22.21 (J/K)  V = 3.14 (cc)  Cp = 12.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.05 | 96.12 | 90.25 | 4.09 | -3.89 | 5.03 | 0.44 |

clinopyroxene  mass = 9.77 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.33Mg0.59Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -142840.55 (J)  H = -121379.75 (J)  S = 19.45 (J/K)  V = 2.89 (cc)  Cp = 10.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.10 | 10.18 | 32.61 | 9.61 | 0.06 | 4.33 | 9.11 |

feldspar  mass = 28.24 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.13Na0.70Ca0.17Al1.17Si2.83O8
G = -455350.11 (J)  H = -387566.00 (J)  S = 61.45 (J/K)  V = 10.86 (cc)  Cp = 34.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.22 | 16.50 | 13.27 |

feldspar  mass = 6.19 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.62Na0.35Ca0.02Al1.02Si2.98O8
G = -97154.82 (J)  H = -82541.14 (J)  S = 13.25 (J/K)  V = 2.43 (cc)  Cp = 7.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.47 | 2.39 | 62.15 |

quartz  mass = 11.45 (gm)  density = 2.56 (gm/cc)
SiO2
G = -186023.49 (J)  H = -160148.28 (J)  S = 23.46 (J/K)  V = 4.47 (cc)  Cp = 13.38 (J/K)

rhm-oxide  mass = 1.09 (gm)  density = 4.62 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.12Al0.10Ti0.89O3
G = -10771.70 (J)  H = -8547.75 (J)  S = 2.02 (J/K)  V = 0.24 (cc)  Cp = 1.01 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.62 | 6.13 | 72.83 | 4.50 | 4.91 |

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1949.55 (J) H = -1644.17 (J) S = 0.28 (J/K) V = 0.04 (cc) Cp = 0.15 (J/K)

Total solids mass = 78.37 (gm) density = 2.93 (gm/cc)
G = -1181773.97 (J) H = -1002773.33 (J) S = 162.26 (J/K) V = 26.72 (cc) Cp = 90.86 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.80 (gm/cc)
G = -1528193.91 (J) H = -1287963.12 (J) S = 217.77 (J/K) V = 35.71 (cc) Cp = 119.83 (J/K)

Oxygen delta moles = -0.00288563 delta grams = -0.0923366
G = 710.34 (J) H = -75.94 (J) S = -0.71 (J/K) V = -264.67 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 19.81 (gm) density = 2.39 (gm/cc) viscosity = 5.33 (log 10 poise) (analysis in wt %)
G = -318683.48 (J) H = -262526.44 (J) S = 51.37 (J/K) V = 8.30 (cc) Cp = 26.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 69.20 | 0.43 | 12.87 | 0.17 | 0.00 | 0.57 | 0.33 | 0.16 | 0.00 | 0.00 | 1.87 | 3.50 | 5.26 | 0.56 | 5.07 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.48 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -155105.46 (J) H = -130937.00 (J) S = 22.11 (J/K) V = 2.92 (cc) Cp = 12.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.11 | 16.94 | 25.95 |

orthopyroxene mass = 10.34 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.89Mg1.02Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -137038.44 (J) H = -114504.81 (J) S = 20.61 (J/K) V = 2.93 (cc) Cp = 11.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.89 | 96.21 | 89.22 | 3.97 | -3.77 | 4.83 | 0.44 |

clinopyroxene mass = 9.91 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.81Fe"0.31Mg0.60Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -145119.53 (J) H = -123653.56 (J) S = 19.64 (J/K) V = 2.94 (cc) Cp = 11.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.71 | 9.76 | 31.50 | 9.54 | 0.20 | 3.98 | 9.32 |

feldspar mass = 27.30 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.71Ca0.16Al1.16Si2.84O8
G = -439727.79 (J) H = -375090.54 (J) S = 59.13 (J/K) V = 10.50 (cc) Cp = 33.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.05 | 15.97 | 12.98 |

feldspar mass = 7.67 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -120264.43 (J) H = -102404.52 (J) S = 16.34 (J/K) V = 3.01 (cc) Cp = 9.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.15 | 2.19 | 62.66 |

quartz mass = 12.14 (gm) density = 2.56 (gm/cc)
SiO2
G = -196936.90 (J) H = -169898.94 (J) S = 24.73 (J/K) V = 4.74 (cc) Cp = 14.17 (J/K)

rhm-oxide mass = 1.12 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.12Al0.10Ti0.89O3
G = -11025.42 (J) H = -8777.93 (J) S = 2.06 (J/K) V = 0.24 (cc) Cp = 1.04 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.77 | 5.93 | 72.90 | 4.61 | 4.79 |

apatite mass = 0.14 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2095.35 (J) H = -1771.26 (J) S = 0.30 (J/K) V = 0.05 (cc) Cp = 0.16 (J/K)

Total solids mass = 80.10 (gm) density = 2.93 (gm/cc)
G = -1207313.34 (J) H = -1027038.55 (J) S = 164.91 (J/K) V = 27.33 (cc) Cp = 92.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.80 (gm/cc)
G = -1525996.82 (J) H = -1289564.99 (J) S = 216.28 (J/K) V = 35.63 (cc) Cp = 119.48 (J/K)

Oxygen delta moles = -0.00293667 delta grams = -0.09397
G = 715.66 (J) H = -76.25 (J) S = -0.72 (J/K) V = -266.91 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 18.19 (gm) density = 2.38 (gm/cc) viscosity = 5.13 (log 10 poise) (analysis in wt %)
G = -292725.92 (J) H = -241258.06 (J) S = 47.52 (J/K) V = 7.65 (cc) Cp = 24.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.94 | 0.38 | 12.68 | 0.16 | 0.00 | 0.54 | 0.36 | 0.16 | 0.00 | 0.00 | 1.86 | 3.74 | 5.07 | 0.59 | 5.52 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.45 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -168074.03 (J) H = -142222.10 (J) S = 23.87 (J/K) V = 3.17 (cc) Cp = 13.45 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.07 | 16.83 | 26.09 |

orthopyroxene mass = 9.65 (gm) density = 3.52 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.88Mg1.03Fe'''0.01Ti0.00Al0.09Si1.95O6
G = -128088.20 (J) H = -107340.24 (J) S = 19.16 (J/K) V = 2.74 (cc) Cp = 11.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.78 | 96.30 | 88.22 | 3.85 | -3.66 | 4.63 | 0.44 |

clinopyroxene mass = 10.04 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.30Mg0.61Fe'''0.04Ti0.05Al0.23Si1.87O6
G = -147250.15 (J) H = -125807.54 (J) S = 19.80 (J/K) V = 2.98 (cc) Cp = 11.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.25 | 9.35 | 30.43 | 9.46 | 0.33 | 3.63 | 9.54 |

feldspar mass = 26.48 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.72Ca0.15Al1.15Si2.85O8
G = -425890.92 (J) H = -364084.13 (J) S = 57.06 (J/K) V = 10.18 (cc) Cp = 32.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.87 | 15.45 | 12.68 |

feldspar mass = 9.01 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -141087.02 (J) H = -120404.63 (J) S = 19.09 (J/K) V = 3.54 (cc) Cp = 10.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.79 | 2.01 | 63.21 |

quartz mass = 12.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -207268.79 (J) H = -179185.84 (J) S = 25.93 (J/K) V = 4.99 (cc) Cp = 14.92 (J/K)

rhm-oxide mass = 1.14 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'''0.11Al0.09Ti0.90O3
G = -11226.23 (J) H = -8967.01 (J) S = 2.09 (J/K) V = 0.25 (cc) Cp = 1.05 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.91 | 5.73 | 72.99 | 4.70 | 4.67 |

apatite mass = 0.15 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2205.12 (J) H = -1868.39 (J) S = 0.31 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

Total solids mass = 81.72 (gm) density = 2.93 (gm/cc)
G = -1231090.47 (J) H = -1049879.88 (J) S = 167.30 (J/K) V = 27.90 (cc) Cp = 94.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.81 (gm/cc)
G = -1523816.39 (J) H = -1291137.95 (J) S = 214.82 (J/K) V = 35.55 (cc) Cp = 119.16 (J/K)

Oxygen delta moles = -0.00298415 delta grams = -0.0954893
G = 719.87 (J) H = -76.43 (J) S = -0.74 (J/K) V = -268.74 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 800.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.20 COH = 0.99
IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 16.66 (gm) density = 2.37 (gm/cc) viscosity = 4.91 (log 10 poise) (analysis in wt %)
G = -268199.95 (J) H = -221101.61 (J) S = 43.89 (J/K) V = 7.03 (cc) Cp = 22.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.59 | 0.34 | 12.48 | 0.16 | 0.00 | 0.52 | 0.38 | 0.16 | 0.00 | 0.00 | 1.86 | 4.01 | 4.85 | 0.63 | 6.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.35 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -179950.59 (J) H = -152631.90 (J) S = 25.46 (J/K) V = 3.39 (cc) Cp = 14.40 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.05 | 16.72 | 26.22 |

orthopyroxene mass = 9.02 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.04Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -119834.24 (J) H = -100714.69 (J) S = 17.82 (J/K) V = 2.56 (cc) Cp = 10.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.71 | 96.39 | 87.25 | 3.74 | -3.55 | 4.44 | 0.45 |

clinopyroxene mass = 10.17 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.29Mg0.62Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -149256.89 (J) H = -127861.73 (J) S = 19.94 (J/K) V = 3.02 (cc) Cp = 11.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.72 | 8.96 | 29.40 | 9.38 | 0.47 | 3.30 | 9.76 |

feldspar mass = 25.75 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.15Al1.15Si2.85O8
G = -413687.37 (J) H = -354426.33 (J) S = 55.22 (J/K) V = 9.90 (cc) Cp = 31.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.68 | 14.94 | 12.38 |

feldspar mass = 10.23 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -159913.26 (J) H = -136777.08 (J) S = 21.56 (J/K) V = 4.02 (cc) Cp = 12.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.39 | 1.83 | 63.78 |

quartz mass = 13.42 (gm) density = 2.56 (gm/cc)
SiO2
G = -217147.39 (J) H = -188116.84 (J) S = 27.05 (J/K) V = 5.24 (cc) Cp = 15.63 (J/K)

rhm-oxide mass = 1.16 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -11381.82 (J) H = -9120.75 (J) S = 2.11 (J/K) V = 0.25 (cc) Cp = 1.07 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.03 | 5.54 | 73.08 | 4.79 | 4.56 |

apatite mass = 0.16 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2280.78 (J) H = -1936.98 (J) S = 0.32 (J/K) V = 0.05 (cc) Cp = 0.18 (J/K)

Total solids mass = 83.25 (gm) density = 2.93 (gm/cc)

G = -1253452.35 (J)  H = -1071586.30 (J)  S = 169.47 (J/K)  V = 28.44 (cc)  Cp = 96.27 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.82 (gm/cc)
G = -1521652.30 (J)  H = -1292687.91 (J)  S = 213.36 (J/K)  V = 35.47 (cc)  Cp = 118.87 (J/K)

Oxygen  delta moles = -0.00302843  delta grams = -0.0969062
G = 723.10 (J)  H = -76.50 (J)  S = -0.75 (J/K)  V = -270.21 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 790.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -14.09  delta HM = -5.14  NNO = 0.00  QFM = -0.22  COH = 0.95
IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid  mass = 15.18 (gm)  density = 2.36 (gm/cc)  viscosity = 4.65 (log 10 poise)  (analysis in wt %)
G = -244564.97 (J)  H = -201598.88 (J)  S = 40.41 (J/K)  V = 6.44 (cc)  Cp = 20.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.12 | 0.29 | 12.24 | 0.16 | 0.00 | 0.50 | 0.43 | 0.15 | 0.00 | 0.00 | 1.88 | 4.33 | 4.61 | 0.68 | 6.62 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.00 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.57Mg0.26)3Al2Si3O12
G = -188447.20 (J)  H = -160207.39 (J)  S = 26.56 (J/K)  V = 3.56 (cc)  Cp = 15.09 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.16 | 16.62 | 26.22 |

orthopyroxene  mass = 8.71 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.87Mg1.05Fe'"0.01Ti0.00Al0.08Si1.96O6
G = -115690.55 (J)  H = -97498.86 (J)  S = 17.11 (J/K)  V = 2.48 (cc)  Cp = 9.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.07 | 96.49 | 86.68 | 3.62 | -3.45 | 4.27 | 0.45 |

clinopyroxene  mass = 9.83 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.29Mg0.62Fe'"0.04Ti0.05Al0.22Si1.87O6
G = -144454.25 (J)  H = -124064.02 (J)  S = 19.18 (J/K)  V = 2.92 (cc)  Cp = 10.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.96 | 8.62 | 28.59 | 9.21 | 0.61 | 3.00 | 10.00 |

clinopyroxene  mass = 0.49 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.89Fe"0.24Mg0.36Fe'"0.04Ti0.39Al0.71Si1.28O6
G = -7205.92 (J)  H = -6208.19 (J)  S = 0.94 (J/K)  V = 0.14 (cc)  Cp = 0.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.50 | 1.91 | 24.13 | 68.47 | 10.08 | -6.46 | 9.36 |

feldspar  mass = 25.05 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.12Na0.74Ca0.14Al1.14Si2.86O8
G = -402002.95 (J)  H = -345167.40 (J)  S = 53.46 (J/K)  V = 9.63 (cc)  Cp = 30.43 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.51 | 14.39 | 12.09 |

feldspar mass = 11.38 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -177467.84 (J) H = -152131.43 (J) S = 23.83 (J/K) V = 4.47 (cc) Cp = 13.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.00 | 1.67 | 64.33 |

quartz mass = 14.04 (gm) density = 2.56 (gm/cc)
SiO2
G = -226978.72 (J) H = -197041.88 (J) S = 28.16 (J/K) V = 5.48 (cc) Cp = 16.34 (J/K)

rhm-oxide mass = 1.06 (gm) density = 4.62 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.73Mg0.12Fe'"0.11Al0.09Ti0.90O3
G = -10362.72 (J) H = -8329.91 (J) S = 1.91 (J/K) V = 0.23 (cc) Cp = 0.97 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.09 | 5.39 | 73.13 | 4.96 | 4.43 |

apatite mass = 0.16 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2322.78 (J) H = -1977.21 (J) S = 0.33 (J/K) V = 0.05 (cc) Cp = 0.18 (J/K)

Total solids mass = 84.72 (gm) density = 2.93 (gm/cc)
G = -1274932.93 (J) H = -1092626.30 (J) S = 171.48 (J/K) V = 28.96 (cc) Cp = 97.94 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.82 (gm/cc)
G = -1519497.90 (J) H = -1294225.18 (J) S = 211.89 (J/K) V = 35.40 (cc) Cp = 118.62 (J/K)

Oxygen delta moles = -0.00308216 delta grams = -0.0986253
G = 728.35 (J) H = -76.77 (J) S = -0.76 (J/K) V = -272.44 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 780.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.23 COH = 0.92 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 13.07 (gm) density = 2.34 (gm/cc) viscosity = 4.33 (log 10 poise) (analysis in wt %)
G = -210756.45 (J) H = -173598.97 (J) S = 35.28 (J/K) V = 5.58 (cc) Cp = 17.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.57 | 0.24 | 11.82 | 0.16 | 0.00 | 0.51 | 0.47 | 0.15 | 0.00 | 0.00 | 1.91 | 4.80 | 4.29 | 0.75 | 7.33 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.45 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.58Mg0.26)3Al2Si3O12
G = -207051.41 (J) H = -176384.72 (J) S = 29.12 (J/K) V = 3.92 (cc) Cp = 16.60 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.91 | 16.59 | 25.50 |

orthopyroxene mass = 6.68 (gm) density = 3.52 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.88Mg1.04Fe'"0.01Ti0.00Al0.08Si1.96O6
G = -88290.98 (J) H = -74557.82 (J) S = 13.04 (J/K) V = 1.90 (cc) Cp = 7.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.61 | 96.65 | 88.19 | 3.52 | -3.36 | 4.16 | 0.45 |

clinopyroxene mass = 10.44 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.81Fe"0.29Mg0.62Fe'"0.04Ti0.05Al0.22Si1.88O6
G = -153063.94 (J) H = -131738.93 (J) S = 20.25 (J/K) V = 3.10 (cc) Cp = 11.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.09 | 8.41 | 28.83 | 8.69 | 0.84 | 2.78 | 10.36 |

biotite mass = 1.06 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -16839.01 (J) H = -14399.66 (J) S = 2.32 (J/K) V = 0.38 (cc) Cp = 1.34 (J/K)

| annite | phlogopite |
|---|---|
| 3.30 | 96.70 |

feldspar mass = 24.91 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.74Ca0.14Al1.14Si2.86O8
G = -399142.01 (J) H = -343447.05 (J) S = 52.88 (J/K) V = 9.58 (cc) Cp = 30.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.50 | 13.56 | 11.94 |

feldspar mass = 11.58 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.02Al1.02Si2.98O8
G = -180372.23 (J) H = -154965.21 (J) S = 24.12 (J/K) V = 4.55 (cc) Cp = 13.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.85 | 1.50 | 64.65 |

quartz mass = 15.33 (gm) density = 2.56 (gm/cc)
SiO2
G = -247562.84 (J) H = -215355.61 (J) S = 30.58 (J/K) V = 5.99 (cc) Cp = 17.82 (J/K)

rhm-oxide mass = 1.21 (gm) density = 4.63 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.74Mg0.12Fe'"0.11Al0.08Ti0.90O3
G = -11795.56 (J) H = -9505.87 (J) S = 2.17 (J/K) V = 0.26 (cc) Cp = 1.11 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.69 | 5.37 | 73.76 | 4.95 | 4.23 |

apatite mass = 0.17 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2514.75 (J) H = -2145.55 (J) S = 0.35 (J/K) V = 0.06 (cc) Cp = 0.19 (J/K)

Total solids mass = 86.83 (gm) density = 2.92 (gm/cc)
G = -1306632.73 (J) H = -1122500.42 (J) S = 174.84 (J/K) V = 29.73 (cc) Cp = 100.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.83 (gm/cc)
G = -1517389.18 (J) H = -1296099.39 (J) S = 210.12 (J/K) V = 35.31 (cc) Cp = 118.27 (J/K)

Oxygen delta moles = -0.00307774 delta grams = -0.0984841
G = 719.75 (J) H = -75.58 (J) S = -0.76 (J/K) V = -269.49 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 770.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -14.54  delta HM = -5.16  NNO = 0.00  QFM = -0.24  COH = 0.88  IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid  mass = 10.60 (gm)  density = 2.32 (gm/cc)  viscosity = 3.91 (log 10 poise)  (analysis in wt %)
G = -170853.87 (J)  H = -140472.87 (J)  S = 29.12 (J/K)  V = 4.56 (cc)  Cp = 14.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.85 | 0.19 | 11.09 | 0.19 | 0.00 | 0.56 | 0.56 | 0.13 | 0.00 | 0.00 | 1.97 | 5.53 | 3.86 | 0.83 | 8.24 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 17.00 (gm)  density = 3.96 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.60Mg0.24)3Al2Si3O12
G = -226143.78 (J)  H = -192968.93 (J)  S = 31.80 (J/K)  V = 4.30 (cc)  Cp = 18.19 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.68 | 16.67 | 23.65 |

orthopyroxene  mass = 3.95 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.93Mg0.99Fe'"0.01Ti0.00Al0.08Si1.96O6
G = -51557.92 (J)  H = -43575.41 (J)  S = 7.65 (J/K)  V = 1.12 (cc)  Cp = 4.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.76 | 96.91 | 93.13 | 3.44 | -3.30 | 4.15 | 0.44 |

clinopyroxene  mass = 10.64 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.11Ca0.81Fe"0.31Mg0.60Fe'"0.04Ti0.04Al0.21Si1.89O6
G = -155004.78 (J)  H = -133598.70 (J)  S = 20.52 (J/K)  V = 3.15 (cc)  Cp = 11.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.26 | 8.42 | 30.93 | 7.58 | 1.20 | 2.69 | 10.91 |

biotite  mass = 3.06 (gm)  density = 2.78 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -48252.77 (J)  H = -41339.76 (J)  S = 6.63 (J/K)  V = 1.10 (cc)  Cp = 3.85 (J/K)

| annite | phlogopite |
|---|---|
| 4.17 | 95.83 |

feldspar  mass = 25.14 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.12Na0.76Ca0.12Al1.12Si2.88O8
G = -402373.71 (J)  H = -346955.57 (J)  S = 53.13 (J/K)  V = 9.68 (cc)  Cp = 30.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.69 | 12.32 | 11.99 |

feldspar  mass = 10.88 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.65Na0.34Ca0.01Al1.01Si2.99O8
G = -169233.98 (J)  H = -145717.14 (J)  S = 22.54 (J/K)  V = 4.27 (cc)  Cp = 12.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.04 | 1.33 | 64.62 |

quartz  mass = 17.17 (gm)  density = 2.56 (gm/cc)
SiO2
G = -276879.74 (J)  H = -241354.96 (J)  S = 34.06 (J/K)  V = 6.71 (cc)  Cp = 19.93 (J/K)

rhm-oxide mass = 1.26 (gm) density = 4.64 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.75Mg0.11Fe'"0.11Al0.08Ti0.90O3
G = -12188.79 (J) H = -9839.35 (J) S = 2.25 (J/K) V = 0.27 (cc) Cp = 1.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.64 | 5.60 | 74.76 | 5.07 | 3.92 |

apatite mass = 0.20 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2825.41 (J) H = -2416.14 (J) S = 0.39 (J/K) V = 0.06 (cc) Cp = 0.22 (J/K)

Total solids mass = 89.31 (gm) density = 2.91 (gm/cc)
G = -1344460.88 (J) H = -1157765.97 (J) S = 178.97 (J/K) V = 30.66 (cc) Cp = 103.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.84 (gm/cc)
G = -1515314.75 (J) H = -1298238.84 (J) S = 208.10 (J/K) V = 35.21 (cc) Cp = 117.88 (J/K)

Oxygen delta moles = -0.00304609 delta grams = -0.0974712
G = 704.88 (J) H = -73.74 (J) S = -0.75 (J/K) V = -264.19 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 760.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.25 COH = 0.84 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 8.63 (gm) density = 2.31 (gm/cc) viscosity = 3.45 (log 10 poise) (analysis in wt %)
G = -139127.27 (J) H = -114103.59 (J) S = 24.22 (J/K) V = 3.74 (cc) Cp = 11.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.78 | 0.14 | 10.38 | 0.22 | 0.00 | 0.62 | 0.68 | 0.11 | 0.00 | 0.00 | 2.06 | 6.31 | 3.41 | 0.95 | 9.33 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 18.19 (gm) density = 3.97 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.61Mg0.22)3Al2Si3O12
G = -240260.23 (J) H = -205372.30 (J) S = 33.77 (J/K) V = 4.58 (cc) Cp = 19.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.26 | 16.72 | 22.02 |

orthopyroxene mass = 1.79 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.98Mg0.95Fe'"0.01Ti0.00Al0.08Si1.96O6
G = -23105.75 (J) H = -19548.94 (J) S = 3.44 (J/K) V = 0.50 (cc) Cp = 2.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.33 | 97.14 | 97.53 | 3.35 | -3.24 | 4.11 | 0.43 |

clinopyroxene mass = 10.84 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.80Fe"0.33Mg0.57Fe'"0.04Ti0.04Al0.21Si1.89O6
G = -156894.51 (J) H = -135427.41 (J) S = 20.78 (J/K) V = 3.20 (cc) Cp = 11.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.46 | 8.39 | 32.89 | 6.64 | 1.58 | 2.58 | 11.46 |

biotite mass = 4.66 (gm) density = 2.78 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -73158.89 (J) H = -62791.48 (J) S = 10.03 (J/K) V = 1.68 (cc) Cp = 5.85 (J/K)

| annite | phlogopite |
|---|---|
| 5.15 | 94.85 |

feldspar mass = 25.41 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.77Ca0.11Al1.11Si2.89O8
G = -406024.74 (J) H = -350847.56 (J) S = 53.41 (J/K) V = 9.78 (cc) Cp = 31.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.78 | 11.26 | 11.96 |

feldspar mass = 10.25 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.01Al1.01Si2.99O8
G = -159147.07 (J) H = -137334.93 (J) S = 21.11 (J/K) V = 4.02 (cc) Cp = 12.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.04 | 1.17 | 64.78 |

quartz mass = 18.63 (gm) density = 2.60 (gm/cc)
SiO2
G = -300088.47 (J) H = -262610.48 (J) S = 36.28 (J/K) V = 7.17 (cc) Cp = 25.10 (J/K)

rhm-oxide mass = 1.29 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.10Fe'"0.12Al0.07Ti0.91O3
G = -12430.97 (J) H = -10054.06 (J) S = 2.30 (J/K) V = 0.28 (cc) Cp = 1.18 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 9.75 | 5.78 | 75.65 | 5.16 | 3.65 |

apatite mass = 0.21 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3019.44 (J) H = -2587.98 (J) S = 0.42 (J/K) V = 0.07 (cc) Cp = 0.23 (J/K)

Total solids mass = 91.28 (gm) density = 2.92 (gm/cc)
G = -1374130.06 (J) H = -1186575.13 (J) S = 181.54 (J/K) V = 31.28 (cc) Cp = 109.15 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.85 (gm/cc)
G = -1513257.33 (J) H = -1300678.73 (J) S = 205.76 (J/K) V = 35.03 (cc) Cp = 121.14 (J/K)

Oxygen delta moles = -0.00301549 delta grams = -0.0964922
G = 690.41 (J) H = -71.94 (J) S = -0.74 (J/K) V = -259.03 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: intermediate

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 6.86 (gm) density = 2.28 (gm/cc) viscosity = 2.87 (log 10 poise) (analysis in wt %)
G = -110770.46 (J) H = -90462.12 (J) S = 19.85 (J/K) V = 3.01 (cc) Cp = 9.67 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.94 0.10 9.64 0.26 0.00 0.69 0.84 0.10 0.00 0.00 2.25 7.27 2.91 1.15 10.86 0.00 0.00 0.00 0.00

garnet mass = 19.12 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.63Mg0.20)3Al2Si3O12
G = -250805.98 (J) H = -214775.12 (J) S = 35.22 (J/K) V = 4.80 (cc) Cp = 20.29 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 62.70 | 16.81 | 20.49 |

clinopyroxene mass = 11.02 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.12Ca0.80Fe"0.35Mg0.55Fe'"0.04Ti0.04Al0.20Si1.90O6
G = -158464.88 (J) H = -136988.33 (J) S = 20.99 (J/K) V = 3.25 (cc) Cp = 12.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.61 | 8.27 | 34.77 | 5.85 | 1.99 | 2.46 | 12.04 |

biotite mass = 6.06 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.06Mg0.94)3AlSi3O10(OH)2
G = -94614.22 (J) H = -81346.54 (J) S = 12.97 (J/K) V = 2.17 (cc) Cp = 7.59 (J/K)

| annite | phlogopite |
|---|---|
| 6.33 | 93.67 |

feldspar mass = 25.73 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.78Ca0.10Al1.10Si2.90O8
G = -410654.65 (J) H = -355609.16 (J) S = 53.80 (J/K) V = 9.91 (cc) Cp = 31.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 77.79 | 10.36 | 11.84 |

feldspar mass = 9.65 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.01Al1.01Si2.99O8
G = -149589.39 (J) H = -129372.85 (J) S = 19.76 (J/K) V = 3.79 (cc) Cp = 11.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.86 | 1.03 | 65.11 |

quartz mass = 19.93 (gm) density = 2.60 (gm/cc)
SiO2
G = -320634.24 (J) H = -281196.12 (J) S = 38.55 (J/K) V = 7.65 (cc) Cp = 26.62 (J/K)

rhm-oxide mass = 1.32 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.76Mg0.09Fe'"0.12Al0.07Ti0.91O3
G = -12567.79 (J) H = -10185.58 (J) S = 2.33 (J/K) V = 0.28 (cc) Cp = 1.20 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.95 | 5.95 | 76.48 | 5.21 | 3.41 |

apatite mass = 0.22 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3125.27 (J) H = -2684.80 (J) S = 0.43 (J/K) V = 0.07 (cc) Cp = 0.24 (J/K)

Total solids mass = 93.04 (gm) density = 2.91 (gm/cc)
G = -1400456.41 (J) H = -1212158.51 (J) S = 184.04 (J/K) V = 31.93 (cc) Cp = 111.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.86 (gm/cc)
G = -1511226.87 (J) H = -1302620.63 (J) S = 203.89 (J/K) V = 34.94 (cc) Cp = 121.07 (J/K)

Oxygen delta moles = -0.00298171 delta grams = -0.0954112
G = 675.39 (J) H = -70.09 (J) S = -0.73 (J/K) V = -253.65 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 740.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.28 COH = 0.76 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 5.53 (gm) density = 2.24 (gm/cc) viscosity = 2.18 (log 10 poise) (analysis in wt %)
G = -89588.94 (J) H = -72699.87 (J) S = 16.67 (J/K) V = 2.47 (cc) Cp = 7.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.78 | 0.07 | 9.19 | 0.28 | 0.00 | 0.71 | 1.06 | 0.08 | 0.00 | 0.00 | 2.64 | 8.13 | 2.43 | 1.51 | 13.12 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.06 (gm) density = 3.98 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.63Mg0.19)3Al2Si3O12
G = -249304.38 (J) H = -213969.06 (J) S = 34.88 (J/K) V = 4.78 (cc) Cp = 20.17 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.12 | 17.48 | 19.40 |

clinopyroxene mass = 10.76 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.12Ca0.80Fe"0.35Mg0.54Fe'"0.05Ti0.04Al0.21Si1.89O6
G = -154397.58 (J) H = -133767.26 (J) S = 20.36 (J/K) V = 3.17 (cc) Cp = 11.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.64 | 7.37 | 34.80 | 6.28 | 2.28 | 2.24 | 12.38 |

biotite mass = 6.54 (gm) density = 2.79 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -101661.97 (J) H = -87585.97 (J) S = 13.89 (J/K) V = 2.34 (cc) Cp = 8.17 (J/K)

| annite | phlogopite |
|---|---|
| 6.83 | 93.17 |

feldspar mass = 26.16 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.78Ca0.10Al1.10Si2.90O8
G = -417131.50 (J) H = -362030.06 (J) S = 54.39 (J/K) V = 10.07 (cc) Cp = 32.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 78.34 | 10.42 | 11.24 |

feldspar mass = 9.76 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.66Na0.33Ca0.01Al1.01Si2.99O8
G = -151066.97 (J) H = -130943.12 (J) S = 19.86 (J/K) V = 3.83 (cc) Cp = 11.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.75 | 0.94 | 66.31 |

quartz mass = 20.58 (gm) density = 2.61 (gm/cc)
SiO2
G = -330692.36 (J) H = -290638.74 (J) S = 39.53 (J/K) V = 7.89 (cc) Cp = 27.26 (J/K)

rhm-oxide mass = 1.30 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.77Mg0.09Fe'"0.12Al0.07Ti0.91O3
G = -12366.84 (J) H = -10051.18 (J) S = 2.29 (J/K) V = 0.28 (cc) Cp = 1.18 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.52 | 5.76 | 77.26 | 5.13 | 3.33 |

apatite mass = 0.21 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2972.67 (J) H = -2559.51 (J) S = 0.41 (J/K) V = 0.07 (cc) Cp = 0.23 (J/K)

Total solids mass = 94.37 (gm) density = 2.91 (gm/cc)
G = -1419594.26 (J) H = -1231544.88 (J) S = 185.61 (J/K) V = 32.43 (cc) Cp = 113.16 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.86 (gm/cc)
G = -1509183.21 (J) H = -1304244.75 (J) S = 202.28 (J/K) V = 34.90 (cc) Cp = 121.11 (J/K)

Oxygen delta moles = -0.00300632 delta grams = -0.0961987
G = 673.62 (J) H = -69.62 (J) S = -0.73 (J/K) V = -253.24 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: intermediate

T = 730.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.29 COH = 0.72 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 4.33 (gm) density = 2.19 (gm/cc) viscosity = 1.35 (log 10 poise) (analysis in wt %)
G = -70404.76 (J) H = -56587.06 (J) S = 13.77 (J/K) V = 1.97 (cc) Cp = 6.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.92 | 0.05 | 8.56 | 0.30 | 0.00 | 0.74 | 1.39 | 0.07 | 0.00 | 0.00 | 3.37 | 9.21 | 1.88 | 2.16 | 16.37 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.01 (gm) density = 3.99 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.63Mg0.18)3Al2Si3O12
G = -247824.89 (J) H = -213180.28 (J) S = 34.54 (J/K) V = 4.77 (cc) Cp = 20.06 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 63.49 | 18.11 | 18.40 |

clinopyroxene mass = 10.55 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.13Ca0.81Fe"0.35Mg0.52Fe'"0.05Ti0.05Al0.21Si1.89O6
G = -151047.26 (J) H = -131151.28 (J) S = 19.83 (J/K) V = 3.10 (cc) Cp = 11.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.52 | 6.61 | 34.86 | 6.74 | 2.59 | 1.98 | 12.70 |

biotite mass = 6.96 (gm) density = 2.80 (gm/cc) (analysis in mole %)
K(Fe"0.07Mg0.93)3AlSi3O10(OH)2
G = -107908.14 (J) H = -93159.74 (J) S = 14.70 (J/K) V = 2.49 (cc) Cp = 8.68 (J/K)

| annite | phlogopite |
|---|---|
| 7.31 | 92.69 |

feldspar mass = 26.63 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.79Ca0.10Al1.10Si2.90O8
G = -424104.60 (J) H = -368908.08 (J) S = 55.02 (J/K) V = 10.25 (cc) Cp = 33.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 78.89 | 10.42 | 10.69 |

feldspar mass = 9.80 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.01Al1.01Si2.99O8
G = -151409.88 (J) H = -131533.48 (J) S = 19.81 (J/K) V = 3.85 (cc) Cp = 11.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.71 | 0.85 | 67.44 |

quartz mass = 21.17 (gm) density = 2.61 (gm/cc)
SiO2
G = -339697.34 (J) H = -299188.36 (J) S = 40.38 (J/K) V = 8.11 (cc) Cp = 27.81 (J/K)

rhm-oxide mass = 1.28 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.78Mg0.08Fe"'0.11Al0.06Ti0.91O3
G = -12126.52 (J) H = -9884.15 (J) S = 2.24 (J/K) V = 0.27 (cc) Cp = 1.16 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 8.11 | 5.57 | 78.11 | 4.97 | 3.24 |

apatite mass = 0.18 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2632.11 (J) H = -2271.42 (J) S = 0.36 (J/K) V = 0.06 (cc) Cp = 0.20 (J/K)

Total solids mass = 95.57 (gm) density = 2.91 (gm/cc)
G = -1436750.75 (J) H = -1249276.79 (J) S = 186.89 (J/K) V = 32.89 (cc) Cp = 114.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.87 (gm/cc)
G = -1507155.51 (J) H = -1305863.84 (J) S = 200.66 (J/K) V = 34.86 (cc) Cp = 121.31 (J/K)

Oxygen delta moles = -0.0030314 delta grams = -0.097001
G = 671.85 (J) H = -69.15 (J) S = -0.74 (J/K) V = -252.83 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.63 (gm/cc)  viscosity = 2.02 (log 10 poise)  (analysis in wt %)
G = -1635322.22 (J)  H = -1188052.65 (J)  S = 284.31 (J/K)  V = 38.01 (cc)  Cp = 148.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.90 | 1.81 | 0.00 | 8.27 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.02 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.63 (gm/cc)
G = -1635322.22 (J)  H = -1188052.65 (J)  S = 284.31 (J/K)  V = 38.01 (cc)  Cp = 148.95 (J/K)

Oxygen  delta moles = -2.39392e-16  delta grams = -7.66025e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: mafic

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.63 (gm/cc)  viscosity = 2.06 (log 10 poise)  (analysis in wt %)
G = -1632487.90 (J)  H = -1189545.48 (J)  S = 283.37 (J/K)  V = 37.98 (cc)  Cp = 148.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.81 | 0.00 | 8.27 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.06 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.63 (gm/cc)
G = -1632487.90 (J)  H = -1189545.48 (J)  S = 283.37 (J/K)  V = 37.98 (cc)  Cp = 148.95 (J/K)

Oxygen  delta moles = 7.35799e-06  delta grams = 0.000235447
G = -2.67 (J)  H = 0.32 (J)  S = 0.00 (J/K)  V = 0.96 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.64 (gm/cc)  viscosity = 2.10 (log 10 poise)  (analysis in wt %)
G = -1629663.50 (J)  H = -1191038.61 (J)  S = 282.41 (J/K)  V = 37.94 (cc)  Cp = 148.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.81 | 0.00 | 8.27 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.10 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.64 (gm/cc)
G = -1629663.50 (J)  H = -1191038.61 (J)  S = 282.41 (J/K)  V = 37.94 (cc)  Cp = 148.94 (J/K)

Oxygen  delta moles = 1.54757e-05  delta grams = 0.000495203
G = -5.57 (J)  H = 0.66 (J)  S = 0.00 (J/K)  V = 2.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.64 (gm/cc)  viscosity = 2.14 (log 10 poise)  (analysis in wt %)
G = -1626849.12 (J)  H = -1192532.06 (J)  S = 281.45 (J/K)  V = 37.91 (cc)  Cp = 148.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.82 | 0.00 | 8.26 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.14 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.64 (gm/cc)
G = -1626849.12 (J)  H = -1192532.06 (J)  S = 281.45 (J/K)  V = 37.91 (cc)  Cp = 148.94 (J/K)

Oxygen  delta moles = 2.43746e-05  delta grams = 0.000779958
G = -8.72 (J)  H = 1.03 (J)  S = 0.01 (J/K)  V = 3.13 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.64 (gm/cc)  viscosity = 2.19 (log 10 poise)  (analysis in wt %)
G = -1624044.83 (J)  H = -1194025.83 (J)  S = 280.48 (J/K)  V = 37.88 (cc)  Cp = 148.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.82 | 0.00 | 8.26 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.19 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.64 (gm/cc)
G = -1624044.83 (J)  H = -1194025.83 (J)  S = 280.48 (J/K)  V = 37.88 (cc)  Cp = 148.93 (J/K)

Oxygen  delta moles = 3.40771e-05  delta grams = 0.00109043
G = -12.10 (J)  H = 1.42 (J)  S = 0.01 (J/K)  V = 4.34 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.64 (gm/cc)  viscosity = 2.23 (log 10 poise)  (analysis in wt %)
G = -1621250.69 (J)  H = -1195519.94 (J)  S = 279.51 (J/K)  V = 37.84 (cc)  Cp = 148.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.82 | 0.00 | 8.26 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.23 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.64 (gm/cc)
G = -1621250.69 (J)  H = -1195519.94 (J)  S = 279.51 (J/K)  V = 37.84 (cc)  Cp = 148.92 (J/K)

Oxygen  delta moles = 4.46066e-05  delta grams = 0.00142736
G = -15.72 (J)  H = 1.85 (J)  S = 0.01 (J/K)  V = 5.65 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.64 (gm/cc) viscosity = 2.27 (log 10 poise) (analysis in wt %)
G = -1618466.78 (J) H = -1197014.41 (J) S = 278.53 (J/K) V = 37.81 (cc) Cp = 148.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.83 | 0.00 | 8.25 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 2.27 (log 10 poise)

System mass = 100.00 (gm) density = 2.64 (gm/cc)
G = -1618466.78 (J) H = -1197014.41 (J) S = 278.53 (J/K) V = 37.81 (cc) Cp = 148.92 (J/K)

Oxygen delta moles = 5.59873e-05 delta grams = 0.00179153
G = -19.59 (J) H = 2.30 (J) S = 0.01 (J/K) V = 7.04 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.65 (gm/cc) viscosity = 2.32 (log 10 poise) (analysis in wt %)
G = -1615693.18 (J) H = -1198509.26 (J) S = 277.54 (J/K) V = 37.78 (cc) Cp = 148.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.83 | 0.00 | 8.25 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 2.32 (log 10 poise)

System mass = 100.00 (gm) density = 2.65 (gm/cc)
G = -1615693.18 (J) H = -1198509.26 (J) S = 277.54 (J/K) V = 37.78 (cc) Cp = 148.91 (J/K)

Oxygen delta moles = 6.82446e-05 delta grams = 0.00218374
G = -23.70 (J) H = 2.78 (J) S = 0.02 (J/K) V = 8.53 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1220.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.37 COH = 2.39 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.65 (gm/cc) viscosity = 2.36 (log 10 poise) (analysis in wt %)
G = -1612929.97 (J) H = -1200004.49 (J) S = 276.55 (J/K) V = 37.74 (cc) Cp = 148.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.04 | 1.16 | 15.89 | 1.83 | 0.00 | 8.25 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 2.36 (log 10 poise)

System mass = 100.00 (gm) density = 2.65 (gm/cc)
G = -1612929.97 (J) H = -1200004.49 (J) S = 276.55 (J/K) V = 37.74 (cc) Cp = 148.91 (J/K)

Oxygen delta moles = 8.14049e-05 delta grams = 0.00260486
G = -28.06 (J) H = 3.28 (J) S = 0.02 (J/K) V = 10.11 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1210.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.37 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 99.16 (gm) density = 2.65 (gm/cc) viscosity = 2.41 (log 10 poise) (analysis in wt %)
G = -1596668.44 (J) H = -1191309.41 (J) S = 273.31 (J/K) V = 37.41 (cc) Cp = 147.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.17 | 15.99 | 1.84 | 0.00 | 8.26 | 0.18 | 5.60 | 0.00 | 0.00 | 9.84 | 2.92 | 0.90 | 0.24 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 0.84 (gm) density = 3.25 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.72Fe"0.21Mg0.91Fe'"0.06Ti0.01Al0.21Si1.87O6
G = -13509.34 (J) H = -10550.41 (J) S = 2.00 (J/K) V = 0.26 (cc) Cp = 1.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.25 | 26.07 | 20.51 | 7.85 | -5.88 | 11.41 | 1.79 |

Total solids mass = 0.84 (gm) density = 3.25 (gm/cc)
G = -13509.34 (J) H = -10550.41 (J) S = 2.00 (J/K) V = 0.26 (cc) Cp = 1.00 (J/K)

Viscosity of the System: 2.42 (log 10 poise)

System mass = 100.00 (gm) density = 2.65 (gm/cc)
G = -1610177.78 (J) H = -1201859.82 (J) S = 275.30 (J/K) V = 37.67 (cc) Cp = 148.59 (J/K)

Oxygen delta moles = 9.6058e-05 delta grams = 0.00307374
G = -32.86 (J) H = 3.84 (J) S = 0.02 (J/K) V = 11.85 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1200.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.56  delta HM = -4.85  NNO = 0.00  QFM = 0.37  COH = 2.35  IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.04 (gm)  density = 2.65 (gm/cc)  viscosity = 2.50 (log 10 poise)  (analysis in wt %)
G = -1528159.20 (J)  H = -1143038.40 (J)  S = 261.43 (J/K)  V = 35.92 (cc)  Cp = 137.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.13 | 1.20 | 16.45 | 1.83 | 0.00 | 8.30 | 0.19 | 5.14 | 0.00 | 0.00 | 9.47 | 3.03 | 0.93 | 0.25 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 4.96 (gm)  density = 3.25 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.73Fe"0.21Mg0.89Fe'"0.06Ti0.01Al0.23Si1.86O6
G = -79292.64 (J)  H = -62040.93 (J)  S = 11.71 (J/K)  V = 1.52 (cc)  Cp = 5.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.89 | 25.51 | 21.27 | 8.48 | -6.20 | 12.12 | 1.92 |

Total solids  mass = 4.96 (gm)  density = 3.25 (gm/cc)
G = -79292.64 (J)  H = -62040.93 (J)  S = 11.71 (J/K)  V = 1.52 (cc)  Cp = 5.90 (J/K)

Viscosity of the System: 2.57 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.67 (gm/cc)
G = -1607451.84 (J)  H = -1205079.33 (J)  S = 273.14 (J/K)  V = 37.45 (cc)  Cp = 143.12 (J/K)

Oxygen  delta moles = 0.000125398  delta grams = 0.00401259
G = -42.58 (J)  H = 4.97 (J)  S = 0.03 (J/K)  V = 15.36 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1190.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.68  delta HM = -4.86  NNO = 0.00  QFM = 0.36  COH = 2.34  IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid  mass = 91.23 (gm)  density = 2.64 (gm/cc)  viscosity = 2.58 (log 10 poise)  (analysis in wt %)
G = -1465114.22 (J)  H = -1098679.43 (J)  S = 250.44 (J/K)  V = 34.55 (cc)  Cp = 131.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.23 | 1.23 | 16.89 | 1.82 | 0.00 | 8.32 | 0.20 | 4.72 | 0.00 | 0.00 | 9.09 | 3.15 | 0.97 | 0.27 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 8.78 (gm)  density = 3.26 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.73Fe"0.22Mg0.87Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -139642.62 (J)  H = -109459.35 (J)  S = 20.63 (J/K)  V = 2.69 (cc)  Cp = 10.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.26 | 25.15 | 22.10 | 9.11 | -6.49 | 12.80 | 2.07 |

Total solids  mass = 8.78 (gm)  density = 3.26 (gm/cc)
G = -139642.62 (J)  H = -109459.35 (J)  S = 20.63 (J/K)  V = 2.69 (cc)  Cp = 10.40 (J/K)

Viscosity of the System: 2.72 (log 10 poise)

System mass = 100.01 (gm) density = 2.69 (gm/cc)
G = -1604756.84 (J) H = -1208138.78 (J) S = 271.07 (J/K) V = 37.24 (cc) Cp = 141.74 (J/K)

Oxygen delta moles = 0.00017254 delta grams = 0.00552109
G = -58.14 (J) H = 6.77 (J) S = 0.04 (J/K) V = 20.99 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 87.69 (gm) density = 2.64 (gm/cc) viscosity = 2.67 (log 10 poise) (analysis in wt %)
G = -1406863.67 (J) H = -1057763.58 (J) S = 240.24 (J/K) V = 33.27 (cc) Cp = 125.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.37 | 1.25 | 17.31 | 1.81 | 0.00 | 8.31 | 0.21 | 4.33 | 0.00 | 0.00 | 8.72 | 3.26 | 1.01 | 0.28 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 12.32 (gm) density = 3.27 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.73Fe"0.23Mg0.85Fe'"0.07Ti0.01Al0.25Si1.84O6
G = -195226.72 (J) H = -153302.92 (J) S = 28.85 (J/K) V = 3.77 (cc) Cp = 14.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.44 | 24.94 | 22.97 | 9.74 | -6.76 | 13.45 | 2.22 |

Total solids mass = 12.32 (gm) density = 3.27 (gm/cc)
G = -195226.72 (J) H = -153302.92 (J) S = 28.85 (J/K) V = 3.77 (cc) Cp = 14.56 (J/K)

Viscosity of the System: 2.87 (log 10 poise)

System mass = 100.01 (gm) density = 2.70 (gm/cc)
G = -1602090.38 (J) H = -1211066.50 (J) S = 269.09 (J/K) V = 37.04 (cc) Cp = 140.46 (J/K)

Oxygen delta moles = 0.000234764 delta grams = 0.00751217
G = -78.51 (J) H = 9.13 (J) S = 0.06 (J/K) V = 28.36 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1170.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.35 COH = 2.30 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 84.38 (gm) density = 2.63 (gm/cc) viscosity = 2.77 (log 10 poise) (analysis in wt %)
G = -1352859.98 (J) H = -1019896.86 (J) S = 230.72 (J/K) V = 32.09 (cc) Cp = 120.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.54 | 1.26 | 17.70 | 1.79 | 0.00 | 8.27 | 0.22 | 3.97 | 0.00 | 0.00 | 8.35 | 3.37 | 1.05 | 0.29 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 15.63 (gm) density = 3.28 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.73Fe"0.24Mg0.83Fe'"0.07Ti0.02Al0.27Si1.83O6
G = -246590.25 (J) H = -193979.17 (J) S = 36.46 (J/K) V = 4.77 (cc) Cp = 18.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.49 | 24.82 | 23.89 | 10.36 | -7.01 | 14.08 | 2.37 |

Total solids mass = 15.63 (gm) density = 3.28 (gm/cc)
G = -246590.25 (J) H = -193979.17 (J) S = 36.46 (J/K) V = 4.77 (cc) Cp = 18.42 (J/K)

Viscosity of the System: 3.03 (log 10 poise)

System mass = 100.01 (gm) density = 2.71 (gm/cc)
G = -1599450.23 (J) H = -1213876.03 (J) S = 267.18 (J/K) V = 36.86 (cc) Cp = 139.26 (J/K)

Oxygen delta moles = 0.000309459 delta grams = 0.0099023
G = -102.69 (J) H = 11.92 (J) S = 0.08 (J/K) V = 37.13 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1160.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.35 COH = 2.29 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 81.28 (gm) density = 2.62 (gm/cc) viscosity = 2.86 (log 10 poise) (analysis in wt %)
G = -1302654.70 (J) H = -984756.31 (J) S = 221.82 (J/K) V = 30.99 (cc) Cp = 116.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.75 | 1.27 | 18.07 | 1.77 | 0.00 | 8.19 | 0.22 | 3.63 | 0.00 | 0.00 | 7.98 | 3.48 | 1.09 | 0.30 | 1.24 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 18.73 (gm) density = 3.29 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.73Fe"0.25Mg0.81Fe'"0.07Ti0.02Al0.28Si1.82O6
G = -294179.49 (J) H = -231822.28 (J) S = 43.51 (J/K) V = 5.70 (cc) Cp = 22.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.44 | 24.80 | 24.84 | 10.97 | -7.24 | 14.67 | 2.53 |

Total solids mass = 18.73 (gm) density = 3.29 (gm/cc)
G = -294179.49 (J) H = -231822.28 (J) S = 43.51 (J/K) V = 5.70 (cc) Cp = 22.01 (J/K)

Viscosity of the System: 3.18 (log 10 poise)

System mass = 100.01 (gm) density = 2.73 (gm/cc)
G = -1596834.19 (J) H = -1216578.59 (J) S = 265.33 (J/K) V = 36.68 (cc) Cp = 138.14 (J/K)

Oxygen delta moles = 0.000393947 delta grams = 0.0126058
G = -129.72 (J) H = 15.03 (J) S = 0.10 (J/K) V = 46.94 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1150.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.34 COH = 2.27 IW

= 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 78.38 (gm) density = 2.62 (gm/cc) viscosity = 2.96 (log 10 poise) (analysis in wt %)
G = -1255880.44 (J) H = -952077.17 (J) S = 213.47 (J/K) V = 29.96 (cc) Cp = 111.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.98 | 1.28 | 18.42 | 1.74 | 0.00 | 8.08 | 0.23 | 3.32 | 0.00 | 0.00 | 7.62 | 3.59 | 1.13 | 0.31 | 1.29 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 21.63 (gm) density = 3.30 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.72Fe"0.26Mg0.79Fe'"0.08Ti0.02Al0.29Si1.81O6
G = -338359.67 (J) H = -267106.14 (J) S = 50.07 (J/K) V = 6.56 (cc) Cp = 25.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.32 | 24.84 | 25.80 | 11.58 | -7.45 | 15.22 | 2.69 |

Total solids mass = 21.63 (gm) density = 3.30 (gm/cc)
G = -338359.67 (J) H = -267106.14 (J) S = 50.07 (J/K) V = 6.56 (cc) Cp = 25.35 (J/K)

Viscosity of the System: 3.34 (log 10 poise)

System mass = 100.02 (gm) density = 2.74 (gm/cc)
G = -1594240.11 (J) H = -1219183.31 (J) S = 263.54 (J/K) V = 36.52 (cc) Cp = 137.09 (J/K)

Oxygen delta moles = 0.000485427 delta grams = 0.0155331
G = -158.60 (J) H = 18.34 (J) S = 0.12 (J/K) V = 57.44 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1140.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.34 COH = 2.25 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 74.24 (gm) density = 2.61 (gm/cc) viscosity = 3.03 (log 10 poise) (analysis in wt %)
G = -1187998.25 (J) H = -902650.56 (J) S = 201.92 (J/K) V = 28.45 (cc) Cp = 105.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.24 | 1.31 | 18.49 | 1.74 | 0.00 | 8.08 | 0.24 | 3.08 | 0.00 | 0.00 | 7.24 | 3.70 | 1.19 | 0.33 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 24.11 (gm) density = 3.30 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.71Fe"0.27Mg0.78Fe'"0.08Ti0.02Al0.30Si1.80O6
G = -375159.30 (J) H = -296581.36 (J) S = 55.60 (J/K) V = 7.30 (cc) Cp = 28.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.99 | 26.10 | 27.36 | 11.78 | -7.35 | 15.32 | 2.80 |

feldspar mass = 1.67 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.31Ca0.68Al1.68Si2.32O8
G = -28476.13 (J) H = -22800.07 (J) S = 4.02 (J/K) V = 0.62 (cc) Cp = 2.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.87 | 68.47 | 0.66 |

Total solids mass = 25.78 (gm) density = 3.25 (gm/cc)
G = -403635.43 (J) H = -319381.44 (J) S = 59.62 (J/K) V = 7.92 (cc) Cp = 30.24 (J/K)

Viscosity of the System: 3.53 (log 10 poise)

System mass = 100.02 (gm) density = 2.75 (gm/cc)
G = -1591633.67 (J) H = -1222031.99 (J) S = 261.54 (J/K) V = 36.37 (cc) Cp = 135.83 (J/K)

Oxygen delta moles = 0.000520701 delta grams = 0.0166618
G = -168.79 (J) H = 19.48 (J) S = 0.13 (J/K) V = 61.18 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1130.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.33 COH = 2.23 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 69.73 (gm) density = 2.60 (gm/cc) viscosity = 3.09 (log 10 poise) (analysis in wt %)
G = -1113922.60 (J) H = -848088.97 (J) S = 189.45 (J/K) V = 26.79 (cc) Cp = 98.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.49 | 1.35 | 18.44 | 1.74 | 0.00 | 8.11 | 0.26 | 2.86 | 0.00 | 0.00 | 6.90 | 3.79 | 1.27 | 0.35 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 26.10 (gm) density = 3.31 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.69Fe"0.29Mg0.78Fe'"0.08Ti0.02Al0.30Si1.80O6
G = -403917.37 (J) H = -319744.85 (J) S = 59.99 (J/K) V = 7.88 (cc) Cp = 30.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.38 | 27.65 | 29.13 | 11.84 | -7.12 | 15.24 | 2.89 |

clinopyroxene mass = 0.19 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.26Fe"0.50Mg1.07Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -2791.36 (J) H = -2183.67 (J) S = 0.43 (J/K) V = 0.06 (cc) Cp = 0.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -38.72 | 72.43 | 50.10 | 9.08 | -7.36 | 13.20 | 1.26 |

feldspar mass = 4.01 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.32Ca0.67Al1.67Si2.33O8
G = -68396.91 (J) H = -54875.03 (J) S = 9.64 (J/K) V = 1.50 (cc) Cp = 4.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.31 | 66.98 | 0.72 |

Total solids mass = 30.29 (gm) density = 3.21 (gm/cc)
G = -475105.64 (J) H = -376803.55 (J) S = 70.06 (J/K) V = 9.44 (cc) Cp = 35.60 (J/K)

Viscosity of the System: 3.73 (log 10 poise)

System mass = 100.02 (gm) density = 2.76 (gm/cc)
G = -1589028.25 (J) H = -1224892.52 (J) S = 259.51 (J/K) V = 36.22 (cc) Cp = 134.54 (J/K)

Oxygen delta moles = 0.000520422 delta grams = 0.0166529

G = -167.37 (J)  H = 19.28 (J)  S = 0.13 (J/K)  V = 60.71 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1120.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.53  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.22  IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid  mass = 65.13 (gm)  density = 2.59 (gm/cc)  viscosity = 3.15 (log 10 poise)  (analysis in wt %)
G = -1039262.97 (J)  H = -792858.67 (J)  S = 176.87 (J/K)  V = 25.10 (cc)  Cp = 92.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.78 | 1.39 | 18.34 | 1.75 | 0.00 | 8.06 | 0.28 | 2.61 | 0.00 | 0.00 | 6.63 | 3.89 | 1.35 | 0.37 | 1.55 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 25.89 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
cpx Na0.03Ca0.70Fe"0.30Mg0.76Fe'"0.08Ti0.03Al0.30Si1.79O6
G = -398993.30 (J)  H = -316486.57 (J)  S = 59.22 (J/K)  V = 7.80 (cc)  Cp = 30.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.97 | 26.59 | 29.73 | 12.18 | -6.78 | 15.27 | 3.04 |

clinopyroxene  mass = 2.45 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.26Fe"0.52Mg1.05Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -36649.32 (J)  H = -28710.39 (J)  S = 5.70 (J/K)  V = 0.73 (cc)  Cp = 2.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -41.75 | 73.08 | 52.31 | 9.09 | -7.27 | 13.25 | 1.28 |

feldspar  mass = 6.55 (gm)  density = 2.67 (gm/cc)  (analysis in mole %)
K0.01Na0.34Ca0.66Al1.66Si2.34O8
G = -111529.54 (J)  H = -89665.46 (J)  S = 15.69 (J/K)  V = 2.46 (cc)  Cp = 8.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.57 | 65.66 | 0.78 |

Total solids  mass = 34.88 (gm)  density = 3.18 (gm/cc)
G = -547172.16 (J)  H = -434862.41 (J)  S = 80.62 (J/K)  V = 10.98 (cc)  Cp = 41.04 (J/K)

Viscosity of the System: 3.97 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.77 (gm/cc)
G = -1586435.13 (J)  H = -1227721.08 (J)  S = 257.48 (J/K)  V = 36.08 (cc)  Cp = 133.27 (J/K)

Oxygen  delta moles = 0.000505433  delta grams = 0.0161732
G = -161.26 (J)  H = 18.55 (J)  S = 0.13 (J/K)  V = 58.54 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1110.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.32  COH = 2.20  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 60.94 (gm) density = 2.59 (gm/cc) viscosity = 3.21 (log 10 poise) (analysis in wt %)
G = -971472.31 (J) H = -742716.73 (J) S = 165.39 (J/K) V = 23.57 (cc) Cp = 86.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.08 | 1.42 | 18.25 | 1.74 | 0.00 | 7.97 | 0.30 | 2.39 | 0.00 | 0.00 | 6.38 | 3.98 | 1.44 | 0.40 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 25.70 (gm) density = 3.33 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.71Fe"0.30Mg0.74Fe'"0.09Ti0.03Al0.31Si1.79O6
G = -394575.17 (J) H = -313628.24 (J) S = 58.52 (J/K) V = 7.72 (cc) Cp = 29.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.62 | 25.50 | 30.25 | 12.58 | -6.42 | 15.27 | 3.20 |

clinopyroxene mass = 4.52 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.25Fe"0.55Mg1.04Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -67168.11 (J) H = -52692.76 (J) S = 10.47 (J/K) V = 1.34 (cc) Cp = 5.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -44.77 | 73.75 | 54.52 | 9.09 | -7.18 | 13.30 | 1.30 |

feldspar mass = 8.86 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.35Ca0.64Al1.64Si2.36O8
G = -150645.49 (J) H = -121364.05 (J) S = 21.17 (J/K) V = 3.32 (cc) Cp = 10.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.80 | 64.36 | 0.84 |

Total solids mass = 39.08 (gm) density = 3.15 (gm/cc)
G = -612388.77 (J) H = -487685.05 (J) S = 90.16 (J/K) V = 12.39 (cc) Cp = 45.98 (J/K)

Viscosity of the System: 4.23 (log 10 poise)

System mass = 100.02 (gm) density = 2.78 (gm/cc)
G = -1583861.07 (J) H = -1230401.78 (J) S = 255.55 (J/K) V = 35.96 (cc) Cp = 132.11 (J/K)

Oxygen delta moles = 0.000489042 delta grams = 0.0156488
G = -154.78 (J) H = 17.77 (J) S = 0.12 (J/K) V = 56.24 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1100.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.18 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 57.08 (gm) density = 2.58 (gm/cc) viscosity = 3.27 (log 10 poise) (analysis in wt %)
G = -909558.09 (J) H = -696918.02 (J) S = 154.86 (J/K) V = 22.16 (cc) Cp = 80.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.39 | 1.44 | 18.18 | 1.72 | 0.00 | 7.84 | 0.32 | 2.19 | 0.00 | 0.00 | 6.15 | 4.06 | 1.53 | 0.42 | 1.77 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 25.55 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.72Fe"0.31Mg0.72Fe'"0.09Ti0.04Al0.32Si1.78O6
G = -390651.80 (J) H = -311163.66 (J) S = 57.89 (J/K) V = 7.66 (cc) Cp = 29.53 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
19.31 24.39 30.70 13.04 -6.03 15.23 3.35

clinopyroxene mass = 6.42 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.24Fe"0.57Mg1.02Fe'''0.06Ti0.01Al0.24Si1.85O6
G = -94767.55 (J) H = -74452.27 (J) S = 14.79 (J/K) V = 1.90 (cc) Cp = 7.57 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-47.75 74.43 56.70 9.08 -7.10 13.33 1.31

feldspar mass = 10.97 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.36Ca0.63Al1.63Si2.37O8
G = -186326.94 (J) H = -150421.59 (J) S = 26.15 (J/K) V = 4.12 (cc) Cp = 13.40 (J/K)
albite anorthite sanidine
36.01 63.09 0.90

Total solids mass = 42.93 (gm) density = 3.14 (gm/cc)
G = -671746.29 (J) H = -536037.52 (J) S = 98.83 (J/K) V = 13.68 (cc) Cp = 50.50 (J/K)

Viscosity of the System: 4.53 (log 10 poise)

System mass = 100.01 (gm) density = 2.79 (gm/cc)
G = -1581304.38 (J) H = -1232955.54 (J) S = 253.69 (J/K) V = 35.84 (cc) Cp = 131.04 (J/K)

Oxygen delta moles = 0.000469662 delta grams = 0.0150286
G = -147.45 (J) H = 16.89 (J) S = 0.12 (J/K) V = 53.62 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1090.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.31 COH = 2.16 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 53.42 (gm) density = 2.56 (gm/cc) viscosity = 3.34 (log 10 poise) (analysis in wt %)
G = -851634.26 (J) H = -654109.30 (J) S = 144.90 (J/K) V = 20.83 (cc) Cp = 75.28 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
54.80 1.43 18.12 1.69 0.00 7.60 0.34 2.00 0.00 0.00 5.92 4.14 1.62 0.45 1.89 0.00 0.00 0.00 0.00

clinopyroxene mass = 25.45 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.73Fe"0.31Mg0.70Fe'''0.09Ti0.04Al0.32Si1.77O6
G = -387832.38 (J) H = -309596.96 (J) S = 57.39 (J/K) V = 7.62 (cc) Cp = 29.33 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
19.18 23.34 31.04 13.46 -5.63 15.11 3.50

clinopyroxene mass = 8.04 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.24Fe"0.59Mg1.01Fe'''0.06Ti0.01Al0.24Si1.85O6
G = -118082.28 (J) H = -92916.83 (J) S = 18.46 (J/K) V = 2.38 (cc) Cp = 9.46 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-50.42 75.10 58.69 9.03 -7.01 13.29 1.32

feldspar mass = 12.99 (gm) density = 2.66 (gm/cc) (analysis in mole %)

K0.01Na0.37Ca0.62Al1.62Si2.38O8
G = -220287.66 (J) H = -178207.19 (J) S = 30.87 (J/K) V = 4.88 (cc) Cp = 15.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.21 | 61.83 | 0.97 |

spinel mass = 0.11 (gm) density = 4.65 (gm/cc) (analysis in mole %)
Fe"1.09Mg0.23Fe'"1.03Al0.33Cr0.00Ti0.32O4
G = -972.46 (J) H = -648.34 (J) S = 0.24 (J/K) V = 0.02 (cc) Cp = 0.11 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -6.06 | 51.35 | 22.79 | 31.93 |

Total solids mass = 46.59 (gm) density = 3.13 (gm/cc)
G = -727174.77 (J) H = -581369.31 (J) S = 106.96 (J/K) V = 14.90 (cc) Cp = 54.75 (J/K)

Viscosity of the System: 4.90 (log 10 poise)

System mass = 100.02 (gm) density = 2.80 (gm/cc)
G = -1578809.03 (J) H = -1235478.61 (J) S = 251.87 (J/K) V = 35.73 (cc) Cp = 130.03 (J/K)

Oxygen delta moles = 0.000529326 delta grams = 0.0169378
G = -164.83 (J) H = 18.85 (J) S = 0.13 (J/K) V = 59.99 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1080.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.30 COH = 2.14 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 49.65 (gm) density = 2.55 (gm/cc) viscosity = 3.45 (log 10 poise) (analysis in wt %)
G = -794130.41 (J) H = -611807.95 (J) S = 134.74 (J/K) V = 19.50 (cc) Cp = 69.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.57 | 1.36 | 18.07 | 1.59 | 0.00 | 7.03 | 0.37 | 1.84 | 0.00 | 0.00 | 5.72 | 4.21 | 1.73 | 0.49 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 25.51 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.74Fe"0.31Mg0.69Fe'"0.09Ti0.04Al0.32Si1.77O6
G = -388152.06 (J) H = -310624.81 (J) S = 57.29 (J/K) V = 7.63 (cc) Cp = 29.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.79 | 22.72 | 31.14 | 13.41 | -5.40 | 14.74 | 3.59 |

clinopyroxene mass = 8.89 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.23Fe"0.60Mg1.01Fe'"0.06Ti0.01Al0.23Si1.85O6
G = -130128.52 (J) H = -102615.69 (J) S = 20.33 (J/K) V = 2.63 (cc) Cp = 10.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -51.68 | 75.64 | 59.81 | 8.83 | -6.87 | 12.97 | 1.31 |

feldspar mass = 15.22 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.38Ca0.60Al1.60Si2.40O8
G = -257686.05 (J) H = -208891.64 (J) S = 36.06 (J/K) V = 5.72 (cc) Cp = 18.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.48 | 60.49 | 1.04 |

spinel mass = 0.76 (gm) density = 4.66 (gm/cc) (analysis in mole %)
Fe"1.11Mg0.22Fe'''1.03Al0.32Cr0.00Ti0.33O4
G = -6439.02 (J) H = -4299.12 (J) S = 1.58 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -6.07 | 51.52 | 21.96 | 32.59 |

Total solids mass = 50.38 (gm) density = 3.12 (gm/cc)
G = -782405.65 (J) H = -626431.26 (J) S = 115.27 (J/K) V = 16.14 (cc) Cp = 59.07 (J/K)

Viscosity of the System: 5.50 (log 10 poise)

System mass = 100.03 (gm) density = 2.81 (gm/cc)
G = -1576536.06 (J) H = -1238239.21 (J) S = 250.01 (J/K) V = 35.65 (cc) Cp = 128.97 (J/K)

Oxygen delta moles = 0.000963692 delta grams = 0.030837
G = -297.64 (J) H = 33.97 (J) S = 0.25 (J/K) V = 108.42 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 1070.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.30 COH = 2.12 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 46.35 (gm) density = 2.53 (gm/cc) viscosity = 3.54 (log 10 poise) (analysis in wt %)
G = -743415.13 (J) H = -574426.59 (J) S = 125.82 (J/K) V = 18.33 (cc) Cp = 65.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.26 | 1.30 | 18.02 | 1.50 | 0.00 | 6.51 | 0.39 | 1.69 | 0.00 | 0.00 | 5.53 | 4.25 | 1.84 | 0.52 | 2.18 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 25.53 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.74Fe"0.31Mg0.69Fe'''0.09Ti0.04Al0.31Si1.77O6
G = -387717.32 (J) H = -311054.76 (J) S = 57.08 (J/K) V = 7.63 (cc) Cp = 29.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.41 | 22.11 | 31.21 | 13.39 | -5.19 | 14.40 | 3.67 |

clinopyroxene mass = 9.65 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.23Fe"0.61Mg1.00Fe'''0.06Ti0.01Al0.23Si1.85O6
G = -140673.01 (J) H = -111171.89 (J) S = 21.96 (J/K) V = 2.85 (cc) Cp = 11.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.91 | 76.17 | 60.89 | 8.64 | -6.75 | 12.66 | 1.30 |

feldspar mass = 17.24 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.40Ca0.59Al1.59Si2.41O8
G = -291641.89 (J) H = -236909.69 (J) S = 40.75 (J/K) V = 6.49 (cc) Cp = 21.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 39.64 | 59.26 | 1.11 |

spinel mass = 1.27 (gm) density = 4.67 (gm/cc) (analysis in mole %)
Fe"1.12Mg0.21Fe'''1.03Al0.30Cr0.00Ti0.33O4
G = -10772.85 (J) H = -7205.46 (J) S = 2.66 (J/K) V = 0.27 (cc) Cp = 1.19 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 -6.03 51.68 21.20 33.15

Total solids mass = 53.70 (gm) density = 3.11 (gm/cc)
G = -830805.07 (J) H = -666341.80 (J) S = 122.45 (J/K) V = 17.24 (cc) Cp = 62.85 (J/K)

Viscosity of the System: 6.57 (log 10 poise)

System mass = 100.04 (gm) density = 2.81 (gm/cc)
G = -1574220.20 (J) H = -1240768.39 (J) S = 248.26 (J/K) V = 35.57 (cc) Cp = 128.05 (J/K)

Oxygen delta moles = 0.0012866 delta grams = 0.0411695
G = -394.10 (J) H = 44.88 (J) S = 0.33 (J/K) V = 143.68 (cc) Cp = 0.05 (J/K)

**********----------**********
Title: mafic

T = 1060.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.29 COH = 2.10 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 43.43 (gm) density = 2.51 (gm/cc) viscosity = 3.63 (log 10 poise) (analysis in wt %)
G = -698347.51 (J) H = -541146.28 (J) S = 117.92 (J/K) V = 17.28 (cc) Cp = 61.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.88 | 1.23 | 17.96 | 1.41 | 0.00 | 6.04 | 0.42 | 1.56 | 0.00 | 0.00 | 5.36 | 4.28 | 1.96 | 0.56 | 2.32 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 25.51 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.75Fe"0.31Mg0.68Fe'"0.09Ti0.04Al0.31Si1.78O6
G = -386840.91 (J) H = -311132.49 (J) S = 56.79 (J/K) V = 7.62 (cc) Cp = 29.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.03 | 21.51 | 31.24 | 13.40 | -5.00 | 14.07 | 3.76 |

clinopyroxene mass = 10.32 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.22Fe"0.62Mg1.00Fe'"0.06Ti0.01Al0.22Si1.86O6
G = -149956.77 (J) H = -118768.74 (J) S = 23.39 (J/K) V = 3.04 (cc) Cp = 12.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.12 | 76.70 | 61.92 | 8.47 | -6.65 | 12.38 | 1.29 |

feldspar mass = 19.10 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.41Ca0.58Al1.58Si2.42O8
G = -322502.95 (J) H = -262528.20 (J) S = 44.99 (J/K) V = 7.19 (cc) Cp = 23.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.70 | 58.12 | 1.18 |

spinel mass = 1.70 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Fe"1.13Mg0.21Fe'"1.04Al0.29Cr0.00Ti0.34O4
G = -14226.56 (J) H = -9534.88 (J) S = 3.52 (J/K) V = 0.36 (cc) Cp = 1.58 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -5.97 | 51.83 | 20.50 | 33.63 |

Total solids mass = 56.62 (gm) density = 3.11 (gm/cc)

G = -873527.19 (J)  H = -701964.31 (J)  S = 128.69 (J/K)  V = 18.22 (cc)  Cp = 66.19 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.05 (gm)  density = 2.82 (gm/cc)
G = -1571874.70 (J)  H = -1243110.59 (J)  S = 246.61 (J/K)  V = 35.50 (cc)  Cp = 127.24 (J/K)

Oxygen  delta moles = 0.00152401  delta grams = 0.0487665
G = -462.96 (J)  H = 52.61 (J)  S = 0.39 (J/K)  V = 168.92 (cc)  Cp = 0.05 (J/K)

**********----------**********
Title: mafic

T = 1050.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.29  COH = 2.08  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 40.83 (gm)  density = 2.50 (gm/cc)  viscosity = 3.70 (log 10 poise)  (analysis in wt %)
G = -658028.12 (J)  H = -511319.92 (J)  S = 110.88 (J/K)  V = 16.34 (cc)  Cp = 57.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.44 | 1.18 | 17.91 | 1.33 | 0.00 | 5.61 | 0.45 | 1.45 | 0.00 | 0.00 | 5.21 | 4.30 | 2.06 | 0.59 | 2.47 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 25.47 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.75Fe"0.31Mg0.68Fe'"0.09Ti0.04Al0.31Si1.78O6
G = -385711.41 (J)  H = -311006.31 (J)  S = 56.46 (J/K)  V = 7.61 (cc)  Cp = 29.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.65 | 20.91 | 31.24 | 13.43 | -4.82 | 13.75 | 3.83 |

clinopyroxene  mass = 10.92 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.21Fe"0.63Mg1.00Fe'"0.06Ti0.01Al0.22Si1.86O6
G = -158190.57 (J)  H = -125567.03 (J)  S = 24.66 (J/K)  V = 3.22 (cc)  Cp = 12.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.30 | 77.22 | 62.93 | 8.32 | -6.55 | 12.11 | 1.28 |

feldspar  mass = 20.79 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.01Na0.42Ca0.57Al1.57Si2.43O8
G = -350595.02 (J)  H = -285997.93 (J)  S = 48.82 (J/K)  V = 7.83 (cc)  Cp = 25.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.67 | 57.08 | 1.25 |

spinel  mass = 2.04 (gm)  density = 4.69 (gm/cc)  (analysis in mole %)
Fe"1.14Mg0.20Fe'"1.04Al0.28Cr0.00Ti0.34O4
G = -16983.92 (J)  H = -11408.45 (J)  S = 4.21 (J/K)  V = 0.43 (cc)  Cp = 1.89 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -5.88 | 51.97 | 19.85 | 34.06 |

Total solids  mass = 59.23 (gm)  density = 3.10 (gm/cc)
G = -911480.92 (J)  H = -733979.73 (J)  S = 134.15 (J/K)  V = 19.09 (cc)  Cp = 69.15 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.05 (gm) density = 2.82 (gm/cc)
G = -1569509.03 (J) H = -1245299.65 (J) S = 245.03 (J/K) V = 35.43 (cc) Cp = 126.51 (J/K)

Oxygen delta moles = 0.00169475 delta grams = 0.0542299
G = -510.52 (J) H = 57.90 (J) S = 0.43 (J/K) V = 186.44 (cc) Cp = 0.06 (J/K)

**********----------**********
Title: mafic

T = 1040.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.28 COH = 2.06 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 38.50 (gm) density = 2.48 (gm/cc) viscosity = 3.77 (log 10 poise) (analysis in wt %)
G = -621738.58 (J) H = -484429.58 (J) S = 104.56 (J/K) V = 15.50 (cc) Cp = 54.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.94 | 1.12 | 17.86 | 1.26 | 0.00 | 5.22 | 0.47 | 1.35 | 0.00 | 0.00 | 5.06 | 4.30 | 2.17 | 0.63 | 2.62 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 25.42 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.76Fe"0.31Mg0.67Fe'"0.09Ti0.04Al0.31Si1.78O6
G = -384442.94 (J) H = -310766.07 (J) S = 56.11 (J/K) V = 7.59 (cc) Cp = 29.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.27 | 20.32 | 31.22 | 13.50 | -4.66 | 13.45 | 3.91 |

clinopyroxene mass = 11.47 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.01Ca0.21Fe"0.64Mg1.00Fe'"0.05Ti0.01Al0.21Si1.86O6
G = -165554.87 (J) H = -131704.74 (J) S = 25.78 (J/K) V = 3.38 (cc) Cp = 13.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.47 | 77.74 | 63.91 | 8.17 | -6.47 | 11.85 | 1.27 |

feldspar mass = 22.34 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.01Na0.43Ca0.56Al1.56Si2.44O8
G = -376212.62 (J) H = -307545.97 (J) S = 52.29 (J/K) V = 8.42 (cc) Cp = 27.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 42.56 | 56.12 | 1.32 |

spinel mass = 2.32 (gm) density = 4.70 (gm/cc) (analysis in mole %)
Fe"1.15Mg0.19Fe'"1.04Al0.27Cr0.00Ti0.34O4
G = -19181.11 (J) H = -12915.41 (J) S = 4.77 (J/K) V = 0.49 (cc) Cp = 2.15 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -5.78 | 52.11 | 19.24 | 34.42 |

Total solids mass = 61.56 (gm) density = 3.10 (gm/cc)
G = -945391.54 (J) H = -762932.19 (J) S = 138.95 (J/K) V = 19.88 (cc) Cp = 71.79 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.06 (gm) density = 2.83 (gm/cc)
G = -1567130.12 (J) H = -1247361.77 (J) S = 243.51 (J/K) V = 35.37 (cc) Cp = 125.87 (J/K)

Oxygen delta moles = 0.00181266 delta grams = 0.0580031

G = -541.45 (J)  H = 61.27 (J)  S = 0.46 (J/K)  V = 197.91 (cc)  Cp = 0.07 (J/K)

**********----------**********
Title: mafic

T = 1030.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.27  COH = 2.04  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 36.41 (gm)  density = 2.47 (gm/cc)  viscosity = 3.84 (log 10 poise)  (analysis in wt %)
G = -588896.74 (J)  H = -460054.62 (J)  S = 98.87 (J/K)  V = 14.73 (cc)  Cp = 51.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.39 | 1.07 | 17.82 | 1.18 | 0.00 | 4.85 | 0.50 | 1.26 | 0.00 | 0.00 | 4.93 | 4.28 | 2.28 | 0.67 | 2.77 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 25.37 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.76Fe"0.31Mg0.67Fe'"0.09Ti0.05Al0.31Si1.78O6
G = -383104.17 (J)  H = -310465.79 (J)  S = 55.74 (J/K)  V = 7.57 (cc)  Cp = 29.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.87 | 19.73 | 31.18 | 13.59 | -4.50 | 13.15 | 3.98 |

clinopyroxene  mass = 11.97 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.20Fe"0.65Mg1.00Fe'"0.05Ti0.01Al0.21Si1.87O6
G = -172202.83 (J)  H = -137299.30 (J)  S = 26.78 (J/K)  V = 3.52 (cc)  Cp = 13.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.63 | 78.25 | 64.87 | 8.04 | -6.40 | 11.61 | 1.26 |

feldspar  mass = 23.77 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.01Na0.43Ca0.55Al1.55Si2.45O8
G = -399618.65 (J)  H = -327376.07 (J)  S = 55.44 (J/K)  V = 8.96 (cc)  Cp = 29.02 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 43.38 | 55.22 | 1.39 |

spinel  mass = 2.55 (gm)  density = 4.71 (gm/cc)  (analysis in mole %)
Fe"1.16Mg0.19Fe'"1.05Al0.26Cr0.00Ti0.35O4
G = -20920.67 (J)  H = -14122.60 (J)  S = 5.22 (J/K)  V = 0.54 (cc)  Cp = 2.36 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -5.66 | 52.25 | 18.66 | 34.75 |

Total solids  mass = 63.65 (gm)  density = 3.09 (gm/cc)
G = -975846.33 (J)  H = -789263.76 (J)  S = 143.18 (J/K)  V = 20.59 (cc)  Cp = 74.32 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.06 (gm)  density = 2.83 (gm/cc)
G = -1564743.07 (J)  H = -1249318.38 (J)  S = 242.05 (J/K)  V = 35.32 (cc)  Cp = 125.44 (J/K)

Oxygen  delta moles = 0.00188811  delta grams = 0.0604171
G = -559.21 (J)  H = 63.14 (J)  S = 0.48 (J/K)  V = 204.57 (cc)  Cp = 0.07 (J/K)

**********----------**********
Title: mafic

T = 1020.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.27  COH = 2.02  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 34.47 (gm)  density = 2.46 (gm/cc)  viscosity = 3.90 (log 10 poise)  (analysis in wt %)
G = -558331.63 (J)  H = -437299.10 (J)  S = 93.60 (J/K)  V = 14.01 (cc)  Cp = 48.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.84 | 1.03 | 17.79 | 1.11 | 0.00 | 4.52 | 0.53 | 1.17 | 0.00 | 0.00 | 4.76 | 4.26 | 2.39 | 0.66 | 2.93 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 25.30 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.77Fe"0.31Mg0.66Fe'"0.09Ti0.05Al0.31Si1.78O6
G = -381570.70 (J)  H = -310003.28 (J)  S = 55.34 (J/K)  V = 7.55 (cc)  Cp = 28.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.46 | 19.14 | 31.12 | 13.71 | -4.35 | 12.86 | 4.05 |

clinopyroxene  mass = 12.45 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.20Fe"0.66Mg1.00Fe'"0.05Ti0.01Al0.21Si1.87O6
G = -178486.39 (J)  H = -142627.58 (J)  S = 27.73 (J/K)  V = 3.65 (cc)  Cp = 14.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.78 | 78.75 | 65.82 | 7.92 | -6.33 | 11.37 | 1.24 |

feldspar  mass = 25.09 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.01Na0.44Ca0.54Al1.54Si2.46O8
G = -421216.34 (J)  H = -345807.75 (J)  S = 58.31 (J/K)  V = 9.46 (cc)  Cp = 30.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 44.15 | 54.39 | 1.46 |

spinel  mass = 2.73 (gm)  density = 4.72 (gm/cc)  (analysis in mole %)
Fe"1.17Mg0.18Fe'"1.05Al0.25Cr0.00Ti0.35O4
G = -22277.32 (J)  H = -15078.40 (J)  S = 5.57 (J/K)  V = 0.58 (cc)  Cp = 2.52 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -5.53 | 52.38 | 18.10 | 35.05 |

apatite  mass = 0.03 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -466.92 (J)  H = -376.82 (J)  S = 0.07 (J/K)  V = 0.01 (cc)  Cp = 0.04 (J/K)

Total solids  mass = 65.60 (gm)  density = 3.09 (gm/cc)
G = -1004017.67 (J)  H = -813893.82 (J)  S = 147.02 (J/K)  V = 21.25 (cc)  Cp = 76.53 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.06 (gm)  density = 2.84 (gm/cc)
G = -1562349.30 (J)  H = -1251192.93 (J)  S = 240.62 (J/K)  V = 35.26 (cc)  Cp = 124.89 (J/K)

Oxygen  delta moles = 0.00192441  delta grams = 0.0615789
G = -565.10 (J)  H = 63.67 (J)  S = 0.49 (J/K)  V = 206.91 (cc)  Cp = 0.07 (J/K)

**********_____**********
Title: mafic

T = 1010.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.26  COH = 2.00
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 32.87 (gm)  density = 2.45 (gm/cc)  viscosity = 3.98 (log 10 poise)  (analysis in wt %)
G = -532755.61 (J)  H = -418338.11 (J)  S = 89.17 (J/K)  V = 13.42 (cc)  Cp = 46.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.41 | 0.94 | 17.65 | 1.07 | 0.00 | 4.30 | 0.55 | 1.07 | 0.00 | 0.00 | 4.62 | 4.18 | 2.49 | 0.65 | 3.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.65 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.68Mg1.16Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -138627.23 (J)  H = -111225.20 (J)  S = 21.36 (J/K)  V = 2.82 (cc)  Cp = 11.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.22 | 93.69 | 68.03 | 5.98 | -5.31 | 8.52 | 0.31 |

clinopyroxene  mass = 27.54 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.77Fe"0.32Mg0.66Fe'"0.08Ti0.04Al0.30Si1.78O6
G = -413979.44 (J)  H = -337038.86 (J)  S = 59.96 (J/K)  V = 8.21 (cc)  Cp = 31.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.32 | 19.00 | 31.99 | 13.17 | -4.36 | 12.80 | 4.08 |

feldspar  mass = 26.69 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.45Ca0.54Al1.54Si2.46O8
G = -447449.90 (J)  H = -368142.26 (J)  S = 61.81 (J/K)  V = 10.07 (cc)  Cp = 32.53 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 44.70 | 53.78 | 1.53 |

spinel  mass = 3.27 (gm)  density = 4.73 (gm/cc)  (analysis in mole %)
Fe"1.17Mg0.17Fe'"1.07Al0.24Cr0.00Ti0.34O4
G = -26393.32 (J)  H = -17879.90 (J)  S = 6.63 (J/K)  V = 0.69 (cc)  Cp = 3.01 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -4.67 | 53.68 | 16.88 | 34.11 |

apatite  mass = 0.07 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1001.84 (J)  H = -810.49 (J)  S = 0.15 (J/K)  V = 0.02 (cc)  Cp = 0.08 (J/K)

Total solids  mass = 67.21 (gm)  density = 3.08 (gm/cc)
G = -1027451.72 (J)  H = -835096.72 (J)  S = 149.91 (J/K)  V = 21.81 (cc)  Cp = 78.43 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.08 (gm)  density = 2.84 (gm/cc)
G = -1560207.34 (J)  H = -1253434.83 (J)  S = 239.08 (J/K)  V = 35.22 (cc)  Cp = 124.48 (J/K)

Oxygen  delta moles = 0.00240076  delta grams = 0.0768215
G = -698.91 (J)  H = 78.56 (J)  S = 0.61 (J/K)  V = 256.13 (cc)  Cp = 0.09 (J/K)

**********----------**********
Title: mafic

T = 1000.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.25  COH = 1.98
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 31.22 (gm)  density = 2.44 (gm/cc)  viscosity = 4.03 (log 10 poise)  (analysis in wt %)
G = -506579.99 (J)  H = -398758.24 (J)  S = 84.69 (J/K)  V = 12.80 (cc)  Cp = 43.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.81 | 0.90 | 17.62 | 1.01 | 0.00 | 4.01 | 0.58 | 0.99 | 0.00 | 0.00 | 4.47 | 4.15 | 2.60 | 0.64 | 3.23 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.24 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.69Mg1.16Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -146548.94 (J)  H = -117834.65 (J)  S = 22.55 (J/K)  V = 2.99 (cc)  Cp = 12.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.32 | 93.80 | 69.14 | 5.95 | -5.30 | 8.43 | 0.31 |

clinopyroxene  mass = 27.32 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.78Fe"0.32Mg0.65Fe'"0.08Ti0.05Al0.30Si1.78O6
G = -410181.56 (J)  H = -334796.62 (J)  S = 59.21 (J/K)  V = 8.14 (cc)  Cp = 31.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.11 | 18.14 | 31.84 | 13.39 | -4.19 | 12.55 | 4.16 |

feldspar  mass = 27.84 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.45Ca0.53Al1.53Si2.47O8
G = -466061.93 (J)  H = -384282.69 (J)  S = 64.23 (J/K)  V = 10.50 (cc)  Cp = 33.90 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.30 | 53.10 | 1.60 |

spinel  mass = 3.36 (gm)  density = 4.74 (gm/cc)  (analysis in mole %)
Fe"1.18Mg0.16Fe'"1.08Al0.24Cr0.00Ti0.34O4
G = -26945.14 (J)  H = -18302.05 (J)  S = 6.79 (J/K)  V = 0.71 (cc)  Cp = 3.09 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -4.48 | 53.89 | 16.29 | 34.30 |

apatite  mass = 0.10 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1491.78 (J)  H = -1209.80 (J)  S = 0.22 (J/K)  V = 0.03 (cc)  Cp = 0.11 (J/K)

Total solids  mass = 68.86 (gm)  density = 3.08 (gm/cc)
G = -1051229.36 (J)  H = -856425.81 (J)  S = 153.01 (J/K)  V = 22.37 (cc)  Cp = 80.30 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.08 (gm)  density = 2.85 (gm/cc)
G = -1557809.35 (J)  H = -1255184.05 (J)  S = 237.70 (J/K)  V = 35.17 (cc)  Cp = 124.01 (J/K)

Oxygen  delta moles = 0.0023746  delta grams = 0.0759845
G = -685.31 (J)  H = 76.85 (J)  S = 0.60 (J/K)  V = 251.36 (cc)  Cp = 0.09 (J/K)

**********----------**********
Title: mafic

T = 990.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.25  COH = 1.96  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 29.71 (gm)  density = 2.43 (gm/cc)  viscosity = 4.08 (log 10 poise)  (analysis in wt %)
G = -482553.47 (J)  H = -380759.09 (J)  S = 80.59 (J/K)  V = 12.23 (cc)  Cp = 41.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.17 | 0.86 | 17.59 | 0.95 | 0.00 | 3.75 | 0.61 | 0.92 | 0.00 | 0.00 | 4.32 | 4.10 | 2.71 | 0.63 | 3.39 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.80 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.70Mg1.15Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -153945.07 (J)  H = -124048.80 (J)  S = 23.67 (J/K)  V = 3.15 (cc)  Cp = 12.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.44 | 93.93 | 70.24 | 5.92 | -5.30 | 8.34 | 0.30 |

clinopyroxene  mass = 27.13 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.78Fe"0.32Mg0.64Fe'"0.08Ti0.05Al0.30Si1.78O6
G = -406718.42 (J)  H = -332809.57 (J)  S = 58.51 (J/K)  V = 8.07 (cc)  Cp = 30.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.82 | 17.32 | 31.70 | 13.64 | -4.02 | 12.30 | 4.23 |

feldspar  mass = 28.89 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.46Ca0.52Al1.52Si2.48O8
G = -483049.13 (J)  H = -399149.64 (J)  S = 66.42 (J/K)  V = 10.90 (cc)  Cp = 35.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.87 | 52.46 | 1.67 |

spinel  mass = 3.42 (gm)  density = 4.75 (gm/cc)  (analysis in mole %)
Fe"1.19Mg0.16Fe'"1.08Al0.23Cr0.00Ti0.34O4
G = -27232.59 (J)  H = -18547.86 (J)  S = 6.88 (J/K)  V = 0.72 (cc)  Cp = 3.14 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -4.28 | 54.11 | 15.72 | 34.46 |

apatite  mass = 0.13 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1912.84 (J)  H = -1555.03 (J)  S = 0.28 (J/K)  V = 0.04 (cc)  Cp = 0.15 (J/K)

Total solids  mass = 70.37 (gm)  density = 3.07 (gm/cc)
G = -1072858.05 (J)  H = -876110.90 (J)  S = 155.76 (J/K)  V = 22.89 (cc)  Cp = 82.00 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.07 (gm)  density = 2.85 (gm/cc)
G = -1555411.52 (J)  H = -1256869.99 (J)  S = 236.35 (J/K)  V = 35.12 (cc)  Cp = 123.57 (J/K)

Oxygen  delta moles = 0.00232329  delta grams = 0.0743426
G = -664.65 (J)  H = 74.36 (J)  S = 0.59 (J/K)  V = 244.00 (cc)  Cp = 0.08 (J/K)

**********_____**********
Title: mafic

T = 980.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.24  COH = 1.93  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 28.32 (gm)  density = 2.42 (gm/cc)  viscosity = 4.12 (log 10 poise)  (analysis in wt %)
G = -460402.58 (J)  H = -364139.51 (J)  S = 76.82 (J/K)  V = 11.70 (cc)  Cp = 39.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.49 | 0.82 | 17.56 | 0.90 | 0.00 | 3.50 | 0.64 | 0.86 | 0.00 | 0.00 | 4.19 | 4.05 | 2.82 | 0.63 | 3.55 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.33 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.71Mg1.14Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -160924.42 (J)  H = -129952.56 (J)  S = 24.72 (J/K)  V = 3.30 (cc)  Cp = 13.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.59 | 94.06 | 71.35 | 5.90 | -5.30 | 8.27 | 0.30 |

clinopyroxene  mass = 26.96 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.79Fe"0.32Mg0.64Fe'"0.08Ti0.05Al0.30Si1.78O6
G = -403554.44 (J)  H = -331050.71 (J)  S = 57.86 (J/K)  V = 8.02 (cc)  Cp = 30.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.46 | 16.54 | 31.56 | 13.92 | -3.84 | 12.06 | 4.30 |

feldspar  mass = 29.86 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.46Ca0.52Al1.52Si2.48O8
G = -498572.38 (J)  H = -412867.55 (J)  S = 68.39 (J/K)  V = 11.27 (cc)  Cp = 36.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 46.39 | 51.86 | 1.74 |

spinel  mass = 3.45 (gm)  density = 4.76 (gm/cc)  (analysis in mole %)
Fe"1.19Mg0.15Fe'"1.09Al0.22Cr0.00Ti0.35O4
G = -27285.72 (J)  H = -18636.16 (J)  S = 6.90 (J/K)  V = 0.73 (cc)  Cp = 3.16 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -4.08 | 54.33 | 15.17 | 34.57 |

apatite  mass = 0.15 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2275.58 (J)  H = -1854.41 (J)  S = 0.34 (J/K)  V = 0.05 (cc)  Cp = 0.17 (J/K)

Total solids  mass = 71.75 (gm)  density = 3.07 (gm/cc)
G = -1092612.55 (J)  H = -894361.39 (J)  S = 158.20 (J/K)  V = 23.36 (cc)  Cp = 83.55 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.07 (gm)  density = 2.85 (gm/cc)
G = -1553015.12 (J)  H = -1258500.90 (J)  S = 235.02 (J/K)  V = 35.07 (cc)  Cp = 123.17 (J/K)

Oxygen  delta moles = 0.00224963  delta grams = 0.0719853
G = -637.91 (J)  H = 71.20 (J)  S = 0.57 (J/K)  V = 234.39 (cc)  Cp = 0.08 (J/K)

**********----------**********
Title: mafic

T = 970.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.24  COH = 1.91  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 27.04 (gm)  density = 2.41 (gm/cc)  viscosity = 4.16 (log 10 poise)  (analysis in wt %)
G = -439894.97 (J)  H = -348728.22 (J)  S = 73.34 (J/K)  V = 11.22 (cc)  Cp = 37.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.78 | 0.78 | 17.53 | 0.85 | 0.00 | 3.27 | 0.67 | 0.80 | 0.00 | 0.00 | 4.06 | 4.00 | 2.93 | 0.62 | 3.72 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.85 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.06Fe"0.72Mg1.13Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -167580.48 (J)  H = -135619.15 (J)  S = 25.71 (J/K)  V = 3.44 (cc)  Cp = 13.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.76 | 94.20 | 72.47 | 5.89 | -5.32 | 8.21 | 0.29 |

clinopyroxene  mass = 26.80 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.80Fe"0.31Mg0.63Fe'"0.08Ti0.05Al0.30Si1.78O6
G = -400661.09 (J)  H = -329498.46 (J)  S = 57.24 (J/K)  V = 7.97 (cc)  Cp = 30.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.03 | 15.78 | 31.43 | 14.24 | -3.67 | 11.81 | 4.37 |

feldspar  mass = 30.76 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.47Ca0.51Al1.51Si2.49O8
G = -512769.31 (J)  H = -425542.68 (J)  S = 70.17 (J/K)  V = 11.61 (cc)  Cp = 37.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 46.89 | 51.30 | 1.81 |

spinel  mass = 3.45 (gm)  density = 4.76 (gm/cc)  (analysis in mole %)
Fe"1.20Mg0.15Fe'"1.09Al0.22Cr0.00Ti0.35O4
G = -27126.70 (J)  H = -18580.54 (J)  S = 6.87 (J/K)  V = 0.72 (cc)  Cp = 3.15 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.87 | 54.58 | 14.64 | 34.65 |

apatite  mass = 0.17 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2588.49 (J)  H = -2114.50 (J)  S = 0.38 (J/K)  V = 0.06 (cc)  Cp = 0.20 (J/K)

Total solids  mass = 73.03 (gm)  density = 3.07 (gm/cc)
G = -1110726.07 (J)  H = -911355.34 (J)  S = 160.38 (J/K)  V = 23.80 (cc)  Cp = 84.98 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.07 (gm)  density = 2.86 (gm/cc)
G = -1550621.04 (J)  H = -1260083.56 (J)  S = 233.71 (J/K)  V = 35.02 (cc)  Cp = 122.79 (J/K)

Oxygen  delta moles = 0.00215559  delta grams = 0.0689764
G = -605.83 (J)  H = 67.45 (J)  S = 0.54 (J/K)  V = 222.80 (cc)  Cp = 0.08 (J/K)

**********----------**********
Title: mafic

T = 960.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = 0.23  COH = 1.89  IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 25.86 (gm)  density = 2.40 (gm/cc)  viscosity = 4.19 (log 10 poise)  (analysis in wt %)
G = -420831.26 (J)  H = -334377.84 (J)  S = 70.11 (J/K)  V = 10.76 (cc)  Cp = 36.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.03 | 0.75 | 17.51 | 0.80 | 0.00 | 3.06 | 0.70 | 0.74 | 0.00 | 0.00 | 3.94 | 3.94 | 3.03 | 0.62 | 3.89 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.35 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.74Mg1.12Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -173995.56 (J)  H = -141113.36 (J)  S = 26.67 (J/K)  V = 3.58 (cc)  Cp = 14.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.96 | 94.34 | 73.61 | 5.89 | -5.34 | 8.16 | 0.29 |

clinopyroxene  mass = 26.66 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.81Fe"0.31Mg0.62Fe'"0.08Ti0.06Al0.31Si1.77O6
G = -398015.47 (J)  H = -328135.59 (J)  S = 56.67 (J/K)  V = 7.92 (cc)  Cp = 30.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.53 | 15.06 | 31.31 | 14.60 | -3.50 | 11.56 | 4.44 |

feldspar  mass = 31.58 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.47Ca0.51Al1.51Si2.49O8
G = -525757.82 (J)  H = -437265.83 (J)  S = 71.76 (J/K)  V = 11.92 (cc)  Cp = 38.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 47.35 | 50.76 | 1.89 |

spinel  mass = 3.43 (gm)  density = 4.77 (gm/cc)  (analysis in mole %)
Fe"1.21Mg0.14Fe'"1.10Al0.21Cr0.00Ti0.35O4
G = -26771.31 (J)  H = -18390.32 (J)  S = 6.80 (J/K)  V = 0.72 (cc)  Cp = 3.13 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.65 | 54.85 | 14.12 | 34.68 |

apatite  mass = 0.19 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2858.40 (J)  H = -2340.62 (J)  S = 0.42 (J/K)  V = 0.06 (cc)  Cp = 0.22 (J/K)

Total solids  mass = 74.21 (gm)  density = 3.07 (gm/cc)
G = -1127398.57 (J)  H = -927245.72 (J)  S = 162.31 (J/K)  V = 24.21 (cc)  Cp = 86.30 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.07 (gm)  density = 2.86 (gm/cc)
G = -1548229.83 (J)  H = -1261623.56 (J)  S = 232.42 (J/K)  V = 34.97 (cc)  Cp = 122.44 (J/K)

Oxygen  delta moles = 0.00204249  delta grams = 0.0653571
G = -568.91 (J)  H = 63.18 (J)  S = 0.51 (J/K)  V = 209.41 (cc)  Cp = 0.07 (J/K)

**********----------**********
Title: mafic

T = 950.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = 0.22  COH = 1.87  IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 24.75 (gm)  density = 2.39 (gm/cc)  viscosity = 4.22 (log 10 poise)  (analysis in wt %)
G = -403038.49 (J)  H = -320960.10 (J)  S = 67.10 (J/K)  V = 10.34 (cc)  Cp = 34.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.24 | 0.71 | 17.49 | 0.75 | 0.00 | 2.86 | 0.73 | 0.69 | 0.00 | 0.00 | 3.82 | 3.87 | 3.14 | 0.62 | 4.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.85 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.75Mg1.11Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -180243.75 (J)  H = -146493.83 (J)  S = 27.59 (J/K)  V = 3.72 (cc)  Cp = 15.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -78.20 | 94.49 | 74.77 | 5.90 | -5.36 | 8.12 | 0.28 |

clinopyroxene  mass = 26.54 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.81Fe"0.31Mg0.61Fe'"0.08Ti0.06Al0.31Si1.77O6
G = -395599.47 (J)  H = -326948.55 (J)  S = 56.13 (J/K)  V = 7.88 (cc)  Cp = 29.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.95 | 14.35 | 31.20 | 14.99 | -3.32 | 11.32 | 4.51 |

feldspar  mass = 32.34 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.48Ca0.50Al1.50Si2.50O8
G = -537639.09 (J)  H = -448114.64 (J)  S = 73.19 (J/K)  V = 12.21 (cc)  Cp = 39.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 47.78 | 50.26 | 1.96 |

spinel  mass = 3.38 (gm)  density = 4.78 (gm/cc)  (analysis in mole %)
Fe"1.21Mg0.14Fe'"1.10Al0.20Cr0.00Ti0.35O4
G = -26230.06 (J)  H = -18071.33 (J)  S = 6.67 (J/K)  V = 0.71 (cc)  Cp = 3.08 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.42 | 55.15 | 13.61 | 34.66 |

apatite  mass = 0.21 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3090.87 (J)  H = -2537.06 (J)  S = 0.45 (J/K)  V = 0.07 (cc)  Cp = 0.24 (J/K)

Total solids  mass = 75.31 (gm)  density = 3.06 (gm/cc)
G = -1142803.23 (J)  H = -942165.41 (J)  S = 164.03 (J/K)  V = 24.58 (cc)  Cp = 87.51 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.06 (gm)  density = 2.87 (gm/cc)
G = -1545841.73 (J)  H = -1263125.51 (J)  S = 231.14 (J/K)  V = 34.92 (cc)  Cp = 122.11 (J/K)

Oxygen  delta moles = 0.00191099  delta grams = 0.0611494
G = -527.49 (J)  H = 58.43 (J)  S = 0.48 (J/K)  V = 194.34 (cc)  Cp = 0.07 (J/K)

**********----------**********
Title: mafic

T = 940.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = 0.21  COH = 1.84  IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 23.72 (gm)  density = 2.39 (gm/cc)  viscosity = 4.25 (log 10 poise)  (analysis in wt %)
G = -386257.79 (J)  H = -308270.04 (J)  S = 64.29 (J/K)  V = 9.94 (cc)  Cp = 33.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.43 | 0.67 | 17.47 | 0.71 | 0.00 | 2.68 | 0.77 | 0.64 | 0.00 | 0.00 | 3.71 | 3.81 | 3.25 | 0.63 | 4.24 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 13.37 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.76Mg1.10Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -186735.42 (J)  H = -152087.99 (J)  S = 28.56 (J/K)  V = 3.87 (cc)  Cp = 15.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.58 | 94.64 | 76.05 | 5.91 | -5.40 | 8.10 | 0.28 |

clinopyroxene  mass = 26.29 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.31Mg0.61Fe'"0.08Ti0.06Al0.31Si1.77O6
G = -391296.52 (J)  H = -324173.62 (J)  S = 55.33 (J/K)  V = 7.80 (cc)  Cp = 29.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.28 | 13.75 | 31.19 | 15.28 | -3.19 | 11.11 | 4.58 |

clinopyroxene  mass = 0.16 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.92Fe"0.24Mg0.39Fe'"0.09Ti0.35Al0.71Si1.27O6
G = -2378.82 (J)  H = -1979.88 (J)  S = 0.33 (J/K)  V = 0.05 (cc)  Cp = 0.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.20 | 4.01 | 23.68 | 63.95 | 5.68 | 3.22 | 3.66 |

feldspar  mass = 33.02 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.48Ca0.50Al1.50Si2.50O8
G = -548188.48 (J)  H = -457894.43 (J)  S = 74.43 (J/K)  V = 12.47 (cc)  Cp = 39.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.21 | 49.76 | 2.04 |

spinel  mass = 3.28 (gm)  density = 4.78 (gm/cc)  (analysis in mole %)
Fe"1.21Mg0.13Fe'"1.11Al0.20Cr0.00Ti0.34O4
G = -25296.15 (J)  H = -17476.45 (J)  S = 6.45 (J/K)  V = 0.69 (cc)  Cp = 2.98 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.12 | 55.65 | 13.06 | 34.40 |

apatite  mass = 0.22 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3293.90 (J)  H = -2710.20 (J)  S = 0.48 (J/K)  V = 0.07 (cc)  Cp = 0.25 (J/K)

Total solids  mass = 76.34 (gm)  density = 3.06 (gm/cc)
G = -1157189.29 (J)  H = -956322.58 (J)  S = 165.57 (J/K)  V = 24.93 (cc)  Cp = 88.65 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.06 (gm)  density = 2.87 (gm/cc)
G = -1543447.08 (J)  H = -1264592.62 (J)  S = 229.86 (J/K)  V = 34.87 (cc)  Cp = 121.79 (J/K)

Oxygen delta moles = 0.00174314 delta grams = 0.0557783
G = -476.79 (J) H = 52.67 (J) S = 0.44 (J/K) V = 175.82 (cc) Cp = 0.06 (J/K)

**********----------**********
Title: mafic

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 22.72 (gm) density = 2.38 (gm/cc) viscosity = 4.26 (log 10 poise) (analysis in wt %)
G = -370037.01 (J) H = -295935.71 (J) S = 61.59 (J/K) V = 9.55 (cc) Cp = 31.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.57 | 0.61 | 17.43 | 0.68 | 0.00 | 2.53 | 0.80 | 0.59 | 0.00 | 0.00 | 3.61 | 3.76 | 3.36 | 0.63 | 4.42 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.99 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.78Mg1.09Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -194383.93 (J) H = -158626.50 (J) S = 29.72 (J/K) V = 4.04 (cc) Cp = 16.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.32 | 94.80 | 77.67 | 5.92 | -5.45 | 8.11 | 0.27 |

clinopyroxene mass = 25.55 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.32Mg0.60Fe'"0.08Ti0.06Al0.31Si1.77O6
G = -379535.22 (J) H = -315144.18 (J) S = 53.52 (J/K) V = 7.57 (cc) Cp = 28.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.54 | 13.47 | 31.55 | 14.97 | -3.24 | 11.07 | 4.64 |

clinopyroxene mass = 0.91 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.24Mg0.38Fe'"0.09Ti0.35Al0.71Si1.27O6
G = -13465.93 (J) H = -11233.49 (J) S = 1.86 (J/K) V = 0.26 (cc) Cp = 1.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.81 | 3.81 | 23.97 | 64.62 | 5.68 | 3.06 | 3.68 |

feldspar mass = 33.58 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.49Ca0.49Al1.49Si2.51O8
G = -556682.62 (J) H = -465989.71 (J) S = 75.38 (J/K) V = 12.68 (cc) Cp = 40.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.65 | 49.23 | 2.13 |

spinel mass = 3.07 (gm) density = 4.79 (gm/cc) (analysis in mole %)
Fe"1.21Mg0.12Fe'"1.14Al0.20Cr0.00Ti0.33O4
G = -23433.08 (J) H = -16224.97 (J) S = 5.99 (J/K) V = 0.64 (cc) Cp = 2.78 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -2.60 | 56.78 | 12.39 | 33.43 |

apatite mass = 0.23 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3479.86 (J) H = -2870.06 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.27 (J/K)

Total solids mass = 77.33 (gm) density = 3.06 (gm/cc)

G = -1170980.64 (J)  H = -970088.91 (J)  S = 166.97 (J/K)  V = 25.27 (cc)  Cp = 89.73 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.05 (gm)  density = 2.87 (gm/cc)
G = -1541017.64 (J)  H = -1266024.61 (J)  S = 228.56 (J/K)  V = 34.81 (cc)  Cp = 121.48 (J/K)

Oxygen  delta moles = 0.00148557  delta grams = 0.0475366
G = -402.62 (J)  H = 44.36 (J)  S = 0.37 (J/K)  V = 148.61 (cc)  Cp = 0.05 (J/K)

**********----------**********
Title: mafic

T = 920.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.53  delta HM = -5.03  NNO = 0.00  QFM = 0.20  COH = 1.79  IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid  mass = 21.78 (gm)  density = 2.37 (gm/cc)  viscosity = 4.27 (log 10 poise)  (analysis in wt %)
G = -354675.19 (J)  H = -284226.67 (J)  S = 59.04 (J/K)  V = 9.18 (cc)  Cp = 30.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.68 | 0.56 | 17.40 | 0.65 | 0.00 | 2.39 | 0.83 | 0.55 | 0.00 | 0.00 | 3.51 | 3.70 | 3.47 | 0.63 | 4.61 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 14.60 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.79Mg1.07Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -201804.83 (J)  H = -165004.98 (J)  S = 30.84 (J/K)  V = 4.20 (cc)  Cp = 16.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.09 | 94.96 | 79.29 | 5.94 | -5.50 | 8.13 | 0.27 |

clinopyroxene  mass = 24.87 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.32Mg0.60Fe'"0.08Ti0.06Al0.30Si1.78O6
G = -368733.37 (J)  H = -306870.34 (J)  S = 51.85 (J/K)  V = 7.37 (cc)  Cp = 27.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.80 | 13.19 | 31.90 | 14.67 | -3.30 | 11.03 | 4.71 |

clinopyroxene  mass = 1.61 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.24Mg0.37Fe'"0.09Ti0.35Al0.72Si1.26O6
G = -23746.26 (J)  H = -19855.15 (J)  S = 3.26 (J/K)  V = 0.45 (cc)  Cp = 1.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.42 | 3.62 | 24.25 | 65.28 | 5.68 | 2.90 | 3.69 |

feldspar  mass = 34.10 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.49Ca0.49Al1.49Si2.51O8
G = -564470.38 (J)  H = -473524.35 (J)  S = 76.22 (J/K)  V = 12.88 (cc)  Cp = 41.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.06 | 48.72 | 2.22 |

spinel  mass = 2.84 (gm)  density = 4.80 (gm/cc)  (analysis in mole %)
Fe"1.21Mg0.12Fe'"1.16Al0.19Cr0.00Ti0.32O4
G = -21523.15 (J)  H = -14936.56 (J)  S = 5.52 (J/K)  V = 0.59 (cc)  Cp = 2.58 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -2.10 | 57.93 | 11.75 | 32.43 |

apatite mass = 0.25 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3637.32 (J) H = -3007.09 (J) S = 0.53 (J/K) V = 0.08 (cc) Cp = 0.28 (J/K)

Total solids mass = 78.26 (gm) density = 3.06 (gm/cc)
G = -1183915.31 (J) H = -983198.47 (J) S = 168.22 (J/K) V = 25.58 (cc) Cp = 90.75 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.04 (gm) density = 2.88 (gm/cc)
G = -1538590.50 (J) H = -1267425.14 (J) S = 227.27 (J/K) V = 34.76 (cc) Cp = 121.18 (J/K)

Oxygen delta moles = 0.00120764 delta grams = 0.038643
G = -324.28 (J) H = 35.63 (J) S = 0.30 (J/K) V = 119.80 (cc) Cp = 0.04 (J/K)

**********----------**********
Title: mafic

T = 910.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.19 COH = 1.77 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 20.89 (gm) density = 2.37 (gm/cc) viscosity = 4.27 (log 10 poise) (analysis in wt %)
G = -340080.41 (J) H = -273074.12 (J) S = 56.63 (J/K) V = 8.83 (cc) Cp = 29.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.75 | 0.51 | 17.38 | 0.62 | 0.00 | 2.26 | 0.87 | 0.51 | 0.00 | 0.00 | 3.42 | 3.65 | 3.58 | 0.64 | 4.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 15.20 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.81Mg1.06Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -209014.14 (J) H = -171235.87 (J) S = 31.93 (J/K) V = 4.37 (cc) Cp = 17.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.86 | 95.13 | 80.91 | 5.97 | -5.57 | 8.17 | 0.26 |

clinopyroxene mass = 24.25 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.82Fe"0.32Mg0.59Fe'"0.08Ti0.06Al0.30Si1.78O6
G = -358843.39 (J) H = -299317.80 (J) S = 50.31 (J/K) V = 7.18 (cc) Cp = 27.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.06 | 12.92 | 32.24 | 14.38 | -3.36 | 10.99 | 4.77 |

clinopyroxene mass = 2.25 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.25Mg0.37Fe'"0.08Ti0.36Al0.72Si1.26O6
G = -33255.59 (J) H = -27870.27 (J) S = 4.55 (J/K) V = 0.64 (cc) Cp = 2.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.03 | 3.44 | 24.53 | 65.95 | 5.66 | 2.75 | 3.70 |

feldspar mass = 34.58 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.49Ca0.48Al1.48Si2.52O8
G = -571625.47 (J) H = -480556.39 (J) S = 76.97 (J/K) V = 13.06 (cc) Cp = 41.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.46 | 48.23 | 2.31 |

spinel mass = 2.61 (gm) density = 4.81 (gm/cc) (analysis in mole %)
Fe"1.20Mg0.11Fe'''1.18Al0.19Cr0.00Ti0.31O4
G = -19578.11 (J) H = -13618.81 (J) S = 5.04 (J/K) V = 0.54 (cc) Cp = 2.36 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -1.62 | 59.08 | 11.14 | 31.40 |

apatite mass = 0.25 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3768.70 (J) H = -3123.12 (J) S = 0.55 (J/K) V = 0.08 (cc) Cp = 0.29 (J/K)

Total solids mass = 79.14 (gm) density = 3.06 (gm/cc)
G = -1196085.39 (J) H = -995722.26 (J) S = 169.35 (J/K) V = 25.87 (cc) Cp = 91.71 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.03 (gm) density = 2.88 (gm/cc)
G = -1536165.80 (J) H = -1268796.38 (J) S = 225.98 (J/K) V = 34.70 (cc) Cp = 120.90 (J/K)

Oxygen delta moles = 0.00090966 delta grams = 0.029108
G = -241.99 (J) H = 26.52 (J) S = 0.23 (J/K) V = 89.48 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 900.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.19 COH = 1.74 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 20.04 (gm) density = 2.36 (gm/cc) viscosity = 4.26 (log 10 poise) (analysis in wt %)
G = -326172.60 (J) H = -262418.12 (J) S = 54.34 (J/K) V = 8.49 (cc) Cp = 28.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.78 | 0.47 | 17.36 | 0.60 | 0.00 | 2.13 | 0.91 | 0.47 | 0.00 | 0.00 | 3.33 | 3.59 | 3.70 | 0.65 | 5.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 15.79 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.83Mg1.04Fe'''0.03Ti0.00Al0.14Si1.91O6
G = -216025.24 (J) H = -177329.57 (J) S = 32.98 (J/K) V = 4.53 (cc) Cp = 18.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.65 | 95.30 | 82.52 | 6.01 | -5.64 | 8.21 | 0.26 |

clinopyroxene mass = 23.69 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.83Fe"0.33Mg0.59Fe'''0.08Ti0.05Al0.30Si1.78O6
G = -349819.74 (J) H = -292453.60 (J) S = 48.90 (J/K) V = 7.01 (cc) Cp = 26.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.32 | 12.65 | 32.56 | 14.11 | -3.43 | 10.96 | 4.84 |

clinopyroxene mass = 2.85 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.25Mg0.36Fe'''0.08Ti0.36Al0.73Si1.25O6
G = -42027.53 (J) H = -35302.68 (J) S = 5.73 (J/K) V = 0.81 (cc) Cp = 3.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.64 | 3.27 | 24.80 | 66.62 | 5.63 | 2.61 | 3.70 |

feldspar mass = 35.03 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.50Ca0.48Al1.48Si2.52O8
G = -578214.24 (J) H = -487138.20 (J) S = 77.63 (J/K) V = 13.23 (cc) Cp = 42.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.83 | 47.76 | 2.41 |

spinel mass = 2.36 (gm) density = 4.82 (gm/cc) (analysis in mole %)
Fe"1.20Mg0.11Fe'''1.20Al0.19Cr0.00Ti0.30O4
G = -17608.52 (J) H = -12278.58 (J) S = 4.54 (J/K) V = 0.49 (cc) Cp = 2.14 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -1.17 | 60.23 | 10.57 | 30.36 |

apatite mass = 0.26 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3875.87 (J) H = -3219.56 (J) S = 0.56 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 79.98 (gm) density = 3.06 (gm/cc)
G = -1207571.15 (J) H = -1007722.19 (J) S = 170.35 (J/K) V = 26.15 (cc) Cp = 92.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.89 (gm/cc)
G = -1533743.75 (J) H = -1270140.31 (J) S = 224.70 (J/K) V = 34.65 (cc) Cp = 120.63 (J/K)

Oxygen delta moles = 0.000592064 delta grams = 0.0189453
G = -156.03 (J) H = 17.05 (J) S = 0.15 (J/K) V = 57.75 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 890.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.18 COH = 1.72 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 19.23 (gm) density = 2.35 (gm/cc) viscosity = 4.25 (log 10 poise) (analysis in wt %)
G = -312881.67 (J) H = -252206.13 (J) S = 52.16 (J/K) V = 8.17 (cc) Cp = 26.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.77 | 0.43 | 17.35 | 0.57 | 0.00 | 2.01 | 0.95 | 0.44 | 0.00 | 0.00 | 3.25 | 3.53 | 3.81 | 0.67 | 5.22 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 16.37 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.84Mg1.03Fe'''0.03Ti0.00Al0.15Si1.91O6
G = -222849.47 (J) H = -183294.88 (J) S = 34.01 (J/K) V = 4.68 (cc) Cp = 18.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.44 | 95.48 | 84.11 | 6.06 | -5.72 | 8.26 | 0.25 |

clinopyroxene mass = 23.18 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.83Fe"0.33Mg0.59Fe'''0.07Ti0.05Al0.30Si1.79O6
G = -341618.28 (J) H = -286245.62 (J) S = 47.61 (J/K) V = 6.86 (cc) Cp = 25.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.58 | 12.38 | 32.87 | 13.84 | -3.50 | 10.93 | 4.91 |

clinopyroxene mass = 3.41 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.25Mg0.35Fe'"0.08Ti0.36Al0.73Si1.25O6
G = -50094.34 (J) H = -42175.30 (J) S = 6.81 (J/K) V = 0.96 (cc) Cp = 3.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.24 | 3.10 | 25.07 | 67.29 | 5.60 | 2.47 | 3.71 |

feldspar mass = 35.44 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.03Na0.50Ca0.47Al1.47Si2.53O8
G = -584296.76 (J) H = -493317.31 (J) S = 78.22 (J/K) V = 13.39 (cc) Cp = 42.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 50.19 | 47.30 | 2.51 |

spinel mass = 2.11 (gm) density = 4.83 (gm/cc) (analysis in mole %)
Fe"1.19Mg0.10Fe'"1.23Al0.19Cr0.00Ti0.29O4
G = -15623.91 (J) H = -10922.07 (J) S = 4.04 (J/K) V = 0.44 (cc) Cp = 1.91 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -0.74 | 61.39 | 10.04 | 29.31 |

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3960.21 (J) H = -3297.40 (J) S = 0.57 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 80.78 (gm) density = 3.06 (gm/cc)
G = -1218442.96 (J) H = -1019252.60 (J) S = 171.25 (J/K) V = 26.42 (cc) Cp = 93.48 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.89 (gm/cc)
G = -1531324.64 (J) H = -1271458.73 (J) S = 223.42 (J/K) V = 34.59 (cc) Cp = 120.37 (J/K)

Oxygen delta moles = 0.000255394 delta grams = 0.00817231
G = -66.67 (J) H = 7.26 (J) S = 0.06 (J/K) V = 24.70 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 880.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.17 COH = 1.69 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 18.45 (gm) density = 2.35 (gm/cc) viscosity = 4.24 (log 10 poise) (analysis in wt %)
G = -300145.84 (J) H = -242391.81 (J) S = 50.08 (J/K) V = 7.86 (cc) Cp = 25.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.72 | 0.39 | 17.35 | 0.54 | 0.00 | 1.90 | 0.98 | 0.41 | 0.00 | 0.00 | 3.18 | 3.47 | 3.93 | 0.69 | 5.44 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 16.95 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.01Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -229496.66 (J) H = -189139.48 (J) S = 35.00 (J/K) V = 4.84 (cc) Cp = 19.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.23 | 95.66 | 85.70 | 6.12 | -5.81 | 8.32 | 0.24 |

clinopyroxene mass = 22.71 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.83Fe"0.33Mg0.58Fe'"0.07Ti0.05Al0.29Si1.79O6
G = -334195.72 (J) H = -280662.11 (J) S = 46.42 (J/K) V = 6.72 (cc) Cp = 25.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.85 | 12.11 | 33.17 | 13.58 | -3.58 | 10.90 | 4.98 |

clinopyroxene mass = 3.92 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.25Mg0.35Fe'"0.08Ti0.37Al0.74Si1.24O6
G = -57487.50 (J) H = -48510.66 (J) S = 7.78 (J/K) V = 1.10 (cc) Cp = 4.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.84 | 2.94 | 25.33 | 67.96 | 5.56 | 2.34 | 3.71 |

feldspar mass = 35.84 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.03Na0.51Ca0.47Al1.47Si2.53O8
G = -589927.64 (J) H = -499137.09 (J) S = 78.73 (J/K) V = 13.54 (cc) Cp = 43.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 50.52 | 46.86 | 2.62 |

spinel mass = 1.86 (gm) density = 4.84 (gm/cc) (analysis in mole %)
Fe"1.19Mg0.10Fe'"1.25Al0.18Cr0.00Ti0.28O4
G = -13632.80 (J) H = -9554.84 (J) S = 3.54 (J/K) V = 0.38 (cc) Cp = 1.68 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -0.33 | 62.55 | 9.53 | 28.25 |

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4022.65 (J) H = -3357.30 (J) S = 0.58 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 81.55 (gm) density = 3.06 (gm/cc)
G = -1228762.98 (J) H = -1030361.48 (J) S = 172.05 (J/K) V = 26.67 (cc) Cp = 94.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.00 (gm) density = 2.90 (gm/cc)
G = -1528908.81 (J) H = -1272753.29 (J) S = 222.14 (J/K) V = 34.53 (cc) Cp = 120.12 (J/K)

Oxygen delta moles = -9.96936e-05 delta grams = -0.00319008
G = 25.78 (J) H = -2.80 (J) S = -0.02 (J/K) V = -9.56 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: mafic

T = 870.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.16 COH = 1.66 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 17.71 (gm) density = 2.34 (gm/cc) viscosity = 4.21 (log 10 poise) (analysis in wt %)
G = -287910.11 (J) H = -232933.85 (J) S = 48.09 (J/K) V = 7.56 (cc) Cp = 24.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.63 | 0.35 | 17.35 | 0.52 | 0.00 | 1.79 | 1.03 | 0.38 | 0.00 | 0.00 | 3.12 | 3.41 | 4.04 | 0.71 | 5.67 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.52 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.87Mg1.00Fe'"0.02Ti0.00Al0.15Si1.91O6
G = -235975.71 (J) H = -194870.31 (J) S = 35.96 (J/K) V = 4.99 (cc) Cp = 20.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.01 | 95.84 | 87.26 | 6.19 | -5.91 | 8.39 | 0.24 |

clinopyroxene mass = 22.30 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.83Fe"0.33Mg0.58Fe'"0.07Ti0.05Al0.29Si1.79O6
G = -327509.19 (J) H = -275671.35 (J) S = 45.35 (J/K) V = 6.60 (cc) Cp = 24.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.12 | 11.85 | 33.45 | 13.33 | -3.67 | 10.88 | 5.05 |

clinopyroxene mass = 4.38 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.94Fe"0.26Mg0.34Fe'"0.08Ti0.37Al0.75Si1.24O6
G = -64238.27 (J) H = -54331.29 (J) S = 8.67 (J/K) V = 1.24 (cc) Cp = 4.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.44 | 2.79 | 25.59 | 68.63 | 5.51 | 2.21 | 3.71 |

feldspar mass = 36.20 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.03Na0.51Ca0.46Al1.46Si2.54O8
G = -595156.93 (J) H = -504637.39 (J) S = 79.18 (J/K) V = 13.68 (cc) Cp = 43.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 50.84 | 46.44 | 2.73 |

spinel mass = 1.60 (gm) density = 4.85 (gm/cc) (analysis in mole %)
Fe"1.18Mg0.09Fe'"1.27Al0.18Cr0.00Ti0.27O4
G = -11642.76 (J) H = -8181.82 (J) S = 3.03 (J/K) V = 0.33 (cc) Cp = 1.44 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.06 | 63.71 | 9.05 | 27.18 |

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4063.71 (J) H = -3399.55 (J) S = 0.58 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 82.28 (gm) density = 3.06 (gm/cc)
G = -1238586.58 (J) H = -1041091.71 (J) S = 172.76 (J/K) V = 26.92 (cc) Cp = 95.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.98 (gm) density = 2.90 (gm/cc)
G = -1526496.69 (J) H = -1274025.56 (J) S = 220.86 (J/K) V = 34.48 (cc) Cp = 119.87 (J/K)

Oxygen delta moles = -0.000472453 delta grams = -0.0151179
G = 120.98 (J) H = -13.10 (J) S = -0.12 (J/K) V = -44.90 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: mafic

T = 860.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.64 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 17.15 (gm) density = 2.33 (gm/cc) viscosity = 4.21 (log 10 poise) (analysis in wt %)
G = -278617.70 (J) H = -225829.95 (J) S = 46.58 (J/K) V = 7.34 (cc) Cp = 24.00 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.87 | 0.32 | 17.00 | 0.50 | 0.00 | 1.68 | 1.06 | 0.34 | 0.00 | 0.00 | 3.02 | 3.50 | 4.12 | 0.72 | 5.86 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.36 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.55Mg0.27)3Al2Si3O12
G = -46314.37 (J) H = -38806.00 (J) S = 6.63 (J/K) V = 0.86 (cc) Cp = 3.67 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.56 | 17.96 | 27.48 |

orthopyroxene mass = 16.46 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.89Mg0.98Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -220551.15 (J) H = -182492.46 (J) S = 33.59 (J/K) V = 4.68 (cc) Cp = 18.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.63 | 95.99 | 88.95 | 6.04 | -5.78 | 8.19 | 0.24 |

clinopyroxene mass = 22.18 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.83Fe"0.34Mg0.57Fe'"0.07Ti0.05Al0.29Si1.80O6
G = -324971.41 (J) H = -274139.48 (J) S = 44.86 (J/K) V = 6.56 (cc) Cp = 24.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.42 | 11.54 | 33.84 | 12.87 | -3.36 | 10.45 | 5.25 |

clinopyroxene mass = 5.15 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.26Mg0.34Fe'"0.08Ti0.37Al0.75Si1.24O6
G = -75251.07 (J) H = -63784.62 (J) S = 10.12 (J/K) V = 1.45 (cc) Cp = 5.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.95 | 2.65 | 25.97 | 68.88 | 5.73 | 1.83 | 3.89 |

feldspar mass = 34.63 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.53Ca0.44Al1.44Si2.56O8
G = -568452.28 (J) H = -482900.07 (J) S = 75.50 (J/K) V = 13.10 (cc) Cp = 41.68 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 52.94 | 44.06 | 3.00 |

spinel mass = 0.75 (gm) density = 4.86 (gm/cc) (analysis in mole %)
Fe"1.18Mg0.09Fe'"1.29Al0.17Cr0.00Ti0.27O4
G = -5380.07 (J) H = -3790.45 (J) S = 1.40 (J/K) V = 0.15 (cc) Cp = 0.67 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | 0.05 | 64.32 | 8.57 | 27.05 |

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4087.62 (J) H = -3427.58 (J) S = 0.58 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 82.80 (gm) density = 3.08 (gm/cc)
G = -1245007.97 (J) H = -1049340.66 (J) S = 172.68 (J/K) V = 26.89 (cc) Cp = 95.47 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.92 (gm/cc)
G = -1523625.67 (J) H = -1275170.61 (J) S = 219.26 (J/K) V = 34.23 (cc) Cp = 119.47 (J/K)

Oxygen delta moles = -0.00174166 delta grams = -0.0557312
G = 441.67 (J) H = -47.68 (J) S = -0.43 (J/K) V = -164.09 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: mafic

T = 850.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.61 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 16.60 (gm) density = 2.33 (gm/cc) viscosity = 4.20 (log 10 poise) (analysis in wt %)
G = -269573.06 (J) H = -218898.99 (J) S = 45.12 (J/K) V = 7.13 (cc) Cp = 23.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.09 | 0.30 | 16.65 | 0.48 | 0.00 | 1.57 | 1.09 | 0.32 | 0.00 | 0.00 | 2.94 | 3.58 | 4.19 | 0.75 | 6.05 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.36 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.55Mg0.27)3Al2Si3O12
G = -87376.75 (J) H = -73364.49 (J) S = 12.48 (J/K) V = 1.63 (cc) Cp = 6.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.23 | 17.99 | 26.78 |

orthopyroxene mass = 15.52 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg0.97Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -206977.67 (J) H = -171617.02 (J) S = 31.48 (J/K) V = 4.40 (cc) Cp = 17.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.97 | 96.13 | 90.39 | 5.88 | -5.64 | 7.97 | 0.24 |

clinopyroxene mass = 22.05 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.83Fe"0.34Mg0.57Fe'"0.07Ti0.05Al0.28Si1.81O6
G = -322551.23 (J) H = -272713.75 (J) S = 44.37 (J/K) V = 6.52 (cc) Cp = 24.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.88 | 11.22 | 34.12 | 12.41 | -3.06 | 9.99 | 5.44 |

clinopyroxene mass = 5.80 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.93Fe"0.26Mg0.33Fe'"0.07Ti0.38Al0.75Si1.23O6
G = -84620.69 (J) H = -71885.51 (J) S = 11.34 (J/K) V = 1.63 (cc) Cp = 6.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.40 | 2.51 | 26.27 | 69.18 | 5.94 | 1.43 | 4.07 |

feldspar mass = 33.29 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.55Ca0.42Al1.42Si2.58O8
G = -545644.43 (J) H = -464402.55 (J) S = 72.33 (J/K) V = 12.61 (cc) Cp = 40.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 54.92 | 41.78 | 3.30 |

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4091.39 (J) H = -3438.77 (J) S = 0.58 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 83.30 (gm) density = 3.10 (gm/cc)

G = -1251262.16 (J)  H = -1057422.08 (J)  S = 172.59 (J/K)  V = 26.88 (cc)  Cp = 95.86 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.91 (gm)  density = 2.94 (gm/cc)
G = -1520835.22 (J)  H = -1276321.08 (J)  S = 217.70 (J/K)  V = 34.01 (cc)  Cp = 119.08 (J/K)

Oxygen  delta moles = -0.00289  delta grams = -0.0924766
G = 725.72 (J)  H = -78.09 (J)  S = -0.72 (J/K)  V = -269.87 (cc)  Cp = -0.10 (J/K)

**********----------**********
Title: mafic

T = 840.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -13.04  delta HM = -5.09  NNO = 0.00  QFM = 0.14  COH = 1.58  IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid  mass = 16.19 (gm)  density = 2.32 (gm/cc)  viscosity = 4.24 (log 10 poise)  (analysis in wt %)
G = -262819.35 (J)  H = -213927.24 (J)  S = 43.92 (J/K)  V = 6.97 (cc)  Cp = 22.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.45 | 0.28 | 16.40 | 0.43 | 0.00 | 1.40 | 1.12 | 0.30 | 0.00 | 0.00 | 2.89 | 3.49 | 4.25 | 0.77 | 6.20 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 7.72 (gm)  density = 3.91 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.55Mg0.27)3Al2Si3O12
G = -105743.90 (J)  H = -88989.28 (J)  S = 15.05 (J/K)  V = 1.97 (cc)  Cp = 8.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.43 | 18.02 | 26.55 |

orthopyroxene  mass = 14.71 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.90Mg0.98Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -195964.05 (J)  H = -162918.43 (J)  S = 29.69 (J/K)  V = 4.17 (cc)  Cp = 16.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.63 | 96.22 | 90.32 | 5.71 | -5.48 | 7.64 | 0.23 |

clinopyroxene  mass = 22.06 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.84Fe"0.34Mg0.58Fe'"0.06Ti0.05Al0.27Si1.81O6
G = -322937.22 (J)  H = -273769.59 (J)  S = 44.17 (J/K)  V = 6.53 (cc)  Cp = 24.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.52 | 10.88 | 33.60 | 12.05 | -2.99 | 9.47 | 5.47 |

clinopyroxene  mass = 5.85 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.94Fe"0.26Mg0.33Fe'"0.07Ti0.38Al0.75Si1.23O6
G = -85395.01 (J)  H = -72725.48 (J)  S = 11.38 (J/K)  V = 1.64 (cc)  Cp = 6.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.50 | 2.37 | 26.05 | 70.01 | 5.93 | 1.02 | 4.13 |

feldspar  mass = 33.10 (gm)  density = 2.64 (gm/cc)  (analysis in mole %)
K0.03Na0.56Ca0.41Al1.41Si2.59O8
G = -541653.89 (J)  H = -461945.25 (J)  S = 71.61 (J/K)  V = 12.55 (cc)  Cp = 39.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.94 | 40.61 | 3.46 |

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4042.34 (J) H = -3405.46 (J) S = 0.57 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 83.71 (gm) density = 3.11 (gm/cc)
G = -1255736.41 (J) H = -1063753.49 (J) S = 172.47 (J/K) V = 26.95 (cc) Cp = 96.19 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.94 (gm/cc)
G = -1518555.77 (J) H = -1277680.73 (J) S = 216.39 (J/K) V = 33.92 (cc) Cp = 118.82 (J/K)

Oxygen delta moles = -0.00309683 delta grams = -0.0990949
G = 769.99 (J) H = -82.59 (J) S = -0.77 (J/K) V = -286.61 (cc) Cp = -0.11 (J/K)

**********_____**********
Title: mafic

T = 830.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.13 COH = 1.55 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 15.80 (gm) density = 2.32 (gm/cc) viscosity = 4.27 (log 10 poise) (analysis in wt %)
G = -256409.62 (J) H = -209207.68 (J) S = 42.79 (J/K) V = 6.81 (cc) Cp = 22.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.79 | 0.26 | 16.15 | 0.39 | 0.00 | 1.25 | 1.15 | 0.28 | 0.00 | 0.00 | 2.86 | 3.40 | 4.30 | 0.80 | 6.36 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.99 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.56Mg0.26)3Al2Si3O12
G = -122992.28 (J) H = -103741.08 (J) S = 17.45 (J/K) V = 2.30 (cc) Cp = 9.76 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.63 | 18.05 | 26.32 |

orthopyroxene mass = 13.94 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg0.98Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -185556.26 (J) H = -154676.24 (J) S = 27.99 (J/K) V = 3.95 (cc) Cp = 15.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.29 | 96.30 | 90.24 | 5.54 | -5.33 | 7.32 | 0.23 |

clinopyroxene mass = 22.07 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.84Fe"0.33Mg0.59Fe'"0.06Ti0.04Al0.26Si1.82O6
G = -323314.22 (J) H = -274816.99 (J) S = 43.96 (J/K) V = 6.54 (cc) Cp = 24.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.14 | 10.55 | 33.07 | 11.70 | -2.92 | 8.96 | 5.49 |

clinopyroxene mass = 5.90 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.94Fe"0.26Mg0.33Fe'"0.07Ti0.38Al0.76Si1.23O6
G = -86099.31 (J) H = -73508.04 (J) S = 11.41 (J/K) V = 1.66 (cc) Cp = 6.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.60 | 2.24 | 25.83 | 70.82 | 5.91 | 0.62 | 4.19 |

feldspar mass = 32.92 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.04Na0.57Ca0.39Al1.39Si2.61O8
G = -537949.16 (J) H = -459721.03 (J) S = 70.91 (J/K) V = 12.49 (cc) Cp = 39.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 56.92 | 39.46 | 3.62 |

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3975.90 (J) H = -3357.28 (J) S = 0.56 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 84.10 (gm) density = 3.11 (gm/cc)
G = -1259887.14 (J) H = -1069820.66 (J) S = 172.29 (J/K) V = 27.02 (cc) Cp = 96.51 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.95 (gm/cc)
G = -1516296.76 (J) H = -1279028.34 (J) S = 215.08 (J/K) V = 33.84 (cc) Cp = 118.57 (J/K)

Oxygen delta moles = -0.00328998 delta grams = -0.105276
G = 809.88 (J) H = -86.58 (J) S = -0.81 (J/K) V = -301.75 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 820.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.12 COH = 1.52 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 15.43 (gm) density = 2.31 (gm/cc) viscosity = 4.30 (log 10 poise) (analysis in wt %)
G = -250316.03 (J) H = -204720.20 (J) S = 41.71 (J/K) V = 6.67 (cc) Cp = 21.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.11 | 0.25 | 15.91 | 0.36 | 0.00 | 1.12 | 1.18 | 0.27 | 0.00 | 0.00 | 2.83 | 3.30 | 4.35 | 0.84 | 6.51 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.20 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.56Mg0.26)3Al2Si3O12
G = -139215.74 (J) H = -117692.75 (J) S = 19.69 (J/K) V = 2.61 (cc) Cp = 11.05 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.83 | 18.07 | 26.11 |

orthopyroxene mass = 13.21 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg0.99Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -175703.73 (J) H = -146852.06 (J) S = 26.39 (J/K) V = 3.75 (cc) Cp = 15.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.95 | 96.39 | 90.13 | 5.37 | -5.18 | 7.01 | 0.23 |

clinopyroxene mass = 22.08 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.33Mg0.59Fe'"0.06Ti0.04Al0.25Si1.83O6
G = -323688.39 (J) H = -275860.99 (J) S = 43.75 (J/K) V = 6.54 (cc) Cp = 24.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.76 | 10.22 | 32.52 | 11.36 | -2.84 | 8.47 | 5.52 |

clinopyroxene mass = 5.94 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.94Fe"0.26Mg0.33Fe'"0.06Ti0.39Al0.76Si1.22O6
G = -86739.76 (J) H = -74238.01 (J) S = 11.44 (J/K) V = 1.67 (cc) Cp = 6.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.70 | 2.11 | 25.60 | 71.61 | 5.89 | 0.24 | 4.26 |

feldspar mass = 32.76 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.04Na0.58Ca0.38Al1.38Si2.62O8
G = -534502.88 (J) H = -457707.75 (J) S = 70.25 (J/K) V = 12.43 (cc) Cp = 39.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 57.86 | 38.35 | 3.79 |

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3891.15 (J) H = -3293.33 (J) S = 0.55 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 84.46 (gm) density = 3.12 (gm/cc)
G = -1263741.65 (J) H = -1075644.89 (J) S = 172.07 (J/K) V = 27.09 (cc) Cp = 96.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.96 (gm/cc)
G = -1514057.68 (J) H = -1280365.09 (J) S = 213.78 (J/K) V = 33.75 (cc) Cp = 118.34 (J/K)

Oxygen delta moles = -0.00347031 delta grams = -0.111046
G = 845.71 (J) H = -90.10 (J) S = -0.86 (J/K) V = -315.41 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 15.08 (gm) density = 2.31 (gm/cc) viscosity = 4.33 (log 10 poise) (analysis in wt %)
G = -244514.48 (J) H = -200447.43 (J) S = 40.68 (J/K) V = 6.53 (cc) Cp = 21.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.40 | 0.23 | 15.66 | 0.32 | 0.00 | 0.99 | 1.21 | 0.25 | 0.00 | 0.00 | 2.80 | 3.20 | 4.39 | 0.88 | 6.66 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.35 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.56Mg0.26)3Al2Si3O12
G = -154497.84 (J) H = -130909.16 (J) S = 21.78 (J/K) V = 2.90 (cc) Cp = 12.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.02 | 18.08 | 25.89 |

orthopyroxene mass = 12.52 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg0.99Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -166361.10 (J) H = -139411.50 (J) S = 24.88 (J/K) V = 3.55 (cc) Cp = 14.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.61 | 96.48 | 90.01 | 5.21 | -5.03 | 6.72 | 0.22 |

clinopyroxene mass = 22.09 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.32Mg0.60Fe'"0.05Ti0.04Al0.25Si1.84O6
G = -324064.74 (J) H = -276905.65 (J) S = 43.54 (J/K) V = 6.55 (cc) Cp = 24.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.37 | 9.90 | 31.95 | 11.02 | -2.77 | 8.01 | 5.54 |

clinopyroxene mass = 5.98 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.94Fe"0.25Mg0.33Fe'"0.06Ti0.39Al0.77Si1.22O6
G = -87322.00 (J) H = -74919.76 (J) S = 11.45 (J/K) V = 1.68 (cc) Cp = 6.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.80 | 1.99 | 25.36 | 72.38 | 5.86 | -0.12 | 4.32 |

feldspar mass = 32.61 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.59Ca0.37Al1.37Si2.63O8
G = -531291.09 (J) H = -455886.07 (J) S = 69.62 (J/K) V = 12.38 (cc) Cp = 39.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.77 | 37.27 | 3.96 |

apatite mass = 0.26 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3786.83 (J) H = -3212.45 (J) S = 0.53 (J/K) V = 0.08 (cc) Cp = 0.29 (J/K)

Total solids mass = 84.81 (gm) density = 3.12 (gm/cc)
G = -1267323.59 (J) H = -1081244.59 (J) S = 171.79 (J/K) V = 27.15 (cc) Cp = 97.10 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 2.97 (gm/cc)
G = -1511838.06 (J) H = -1281692.02 (J) S = 212.48 (J/K) V = 33.67 (cc) Cp = 118.12 (J/K)

Oxygen delta moles = -0.00363859 delta grams = -0.116431
G = 877.75 (J) H = -93.19 (J) S = -0.90 (J/K) V = -327.68 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 14.74 (gm) density = 2.31 (gm/cc) viscosity = 4.36 (log 10 poise) (analysis in wt %)
G = -238984.06 (J) H = -196374.36 (J) S = 39.71 (J/K) V = 6.39 (cc) Cp = 20.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.68 | 0.22 | 15.41 | 0.29 | 0.00 | 0.89 | 1.23 | 0.24 | 0.00 | 0.00 | 2.79 | 3.09 | 4.43 | 0.92 | 6.81 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.43 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.56Mg0.26)3Al2Si3O12
G = -168913.26 (J) H = -143448.28 (J) S = 23.73 (J/K) V = 3.17 (cc) Cp = 13.43 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.22 | 18.09 | 25.69 |

orthopyroxene mass = 11.86 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.90Mg1.00Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -157487.61 (J) H = -132323.61 (J) S = 23.45 (J/K) V = 3.37 (cc) Cp = 13.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.26 | 96.58 | 89.87 | 5.06 | -4.89 | 6.44 | 0.22 |

clinopyroxene mass = 22.10 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.31Mg0.61Fe'"0.05Ti0.04Al0.24Si1.84O6
G = -324447.31 (J) H = -277954.34 (J) S = 43.32 (J/K) V = 6.56 (cc) Cp = 24.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.96 | 9.58 | 31.36 | 10.69 | -2.69 | 7.56 | 5.55 |

clinopyroxene mass = 6.02 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.94Fe"0.25Mg0.33Fe'"0.05Ti0.39Al0.77Si1.21O6
G = -87851.10 (J) H = -75557.28 (J) S = 11.46 (J/K) V = 1.69 (cc) Cp = 6.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.89 | 1.88 | 25.12 | 73.13 | 5.84 | -0.46 | 4.38 |

feldspar mass = 32.47 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.60Ca0.36Al1.36Si2.64O8
G = -528292.81 (J) H = -454239.07 (J) S = 69.01 (J/K) V = 12.33 (cc) Cp = 39.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.65 | 36.21 | 4.14 |

apatite mass = 0.25 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3661.32 (J) H = -3113.13 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.28 (J/K)

Total solids mass = 85.14 (gm) density = 3.13 (gm/cc)
G = -1270653.42 (J) H = -1086635.71 (J) S = 171.47 (J/K) V = 27.21 (cc) Cp = 97.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 2.97 (gm/cc)
G = -1509637.48 (J) H = -1283010.08 (J) S = 211.18 (J/K) V = 33.60 (cc) Cp = 117.92 (J/K)

Oxygen delta moles = -0.00379558 delta grams = -0.121454
G = 906.27 (J) H = -95.88 (J) S = -0.93 (J/K) V = -338.66 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 790.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = 0.09 COH = 1.43 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 14.38 (gm) density = 2.30 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -233034.88 (J) H = -191951.75 (J) S = 38.64 (J/K) V = 6.24 (cc) Cp = 20.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.04 | 0.21 | 15.12 | 0.27 | 0.00 | 0.79 | 1.26 | 0.22 | 0.00 | 0.00 | 2.79 | 2.98 | 4.41 | 0.97 | 6.95 | 0.00 | 0.00 | 0.00 | 0.00 |

```
garnet          mass = 13.40 (gm)  density = 3.92 (gm/cc)     (analysis in mole %)
            (Ca0.18Fe"0.56Mg0.25)3Al2Si3O12
            G = -181651.96 (J)  H = -154610.55 (J)  S = 25.44 (J/K)  V = 3.42 (cc)  Cp = 14.45 (J/K)
        almandine     grossular        pyrope
          56.50         18.11         25.39

orthopyroxene    mass = 11.20 (gm)  density = 3.53 (gm/cc)     (analysis in mole %)
            opx Na0.00Ca0.03Fe"0.90Mg1.00Fe'"0.01Ti0.00Al0.11Si1.94O6
            G = -148473.20 (J)  H = -125064.96 (J)  S = 22.02 (J/K)  V = 3.18 (cc)  Cp = 12.76 (J/K)
        diopside clinoenstatit  hedenbergite alumino-buffo     buffonite      essenite       jadeite
         -93.23         96.68         90.00          4.91         -4.75          6.17          0.21

clinopyroxene    mass = 22.08 (gm)  density = 3.36 (gm/cc)     (analysis in mole %)
            cpx Na0.06Ca0.85Fe"0.31Mg0.62Fe'"0.05Ti0.04Al0.23Si1.85O6
            G = -324320.57 (J)  H = -278549.81 (J)  S = 43.05 (J/K)  V = 6.56 (cc)  Cp = 24.53 (J/K)
        diopside clinoenstatit  hedenbergite alumino-buffo     buffonite      essenite       jadeite
          39.39          9.28         30.91         10.35         -2.60          7.12          5.55

clinopyroxene    mass = 6.06 (gm)  density = 3.56 (gm/cc)     (analysis in mole %)
            cpx Na0.04Ca0.94Fe"0.25Mg0.33Fe'"0.05Ti0.40Al0.77Si1.21O6
            G = -88357.34 (J)  H = -76173.86 (J)  S = 11.46 (J/K)  V = 1.70 (cc)  Cp = 6.54 (J/K)
        diopside clinoenstatit  hedenbergite alumino-buffo     buffonite      essenite       jadeite
         -10.06          1.77         24.98         73.83          5.83         -0.79          4.44

biotite         mass = 0.11 (gm)  density = 2.76 (gm/cc)     (analysis in mole %)
            K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
            G = -1726.32 (J)  H = -1473.93 (J)  S = 0.24 (J/K)  V = 0.04 (cc)  Cp = 0.14 (J/K)
          annite    phlogopite
           3.58         96.42

feldspar        mass = 32.40 (gm)  density = 2.63 (gm/cc)     (analysis in mole %)
            K0.04Na0.60Ca0.35Al1.35Si2.65O8
            G = -526354.26 (J)  H = -453503.14 (J)  S = 68.52 (J/K)  V = 12.31 (cc)  Cp = 39.01 (J/K)
          albite     anorthite      sanidine
           60.49         35.27          4.24

apatite         mass = 0.24 (gm)  density = 3.06 (gm/cc)
            Ca5(PO4)3OH
            G = -3537.33 (J)  H = -3014.61 (J)  S = 0.49 (J/K)  V = 0.08 (cc)  Cp = 0.27 (J/K)

Total solids     mass = 85.49 (gm)  density = 3.13 (gm/cc)
            G = -1274420.99 (J)  H = -1092390.87 (J)  S = 171.22 (J/K)  V = 27.29 (cc)  Cp = 97.71 (J/K)

Viscosity of the System cannot be computed.

System          mass = 99.87 (gm)  density = 2.98 (gm/cc)
            G = -1507455.87 (J)  H = -1284342.61 (J)  S = 209.86 (J/K)  V = 33.53 (cc)  Cp = 117.73 (J/K)

Oxygen          delta moles = -0.00394139  delta grams = -0.12612
            G = 931.40 (J)  H = -98.17 (J)  S = -0.97 (J/K)  V = -348.39 (cc)  Cp = -0.14 (J/K)

**********----------**********
Title: mafic
```

T = 780.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.31  delta HM = -5.15  NNO = 0.00  QFM = 0.08  COH = 1.40  IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid  mass = 13.97 (gm)  density = 2.30 (gm/cc)  viscosity = 4.46 (log 10 poise)  (analysis in wt %)
G = -226215.60 (J)  H = -186829.20 (J)  S = 37.40 (J/K)  V = 6.07 (cc)  Cp = 19.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.62 | 0.20 | 14.71 | 0.24 | 0.00 | 0.71 | 1.30 | 0.21 | 0.00 | 0.00 | 2.80 | 2.84 | 4.30 | 1.01 | 7.06 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 14.21 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.57Mg0.25)3Al2Si3O12
G = -192023.84 (J)  H = -163791.12 (J)  S = 26.81 (J/K)  V = 3.62 (cc)  Cp = 15.29 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.96 | 18.16 | 24.88 |

orthopyroxene  mass = 10.48 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg1.00Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -138505.28 (J)  H = -116938.27 (J)  S = 20.48 (J/K)  V = 2.97 (cc)  Cp = 11.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -93.84 | 96.80 | 90.75 | 4.77 | -4.62 | 5.94 | 0.20 |

clinopyroxene  mass = 22.01 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.31Mg0.62Fe'"0.04Ti0.04Al0.22Si1.86O6
G = -323205.46 (J)  H = -278261.04 (J)  S = 42.68 (J/K)  V = 6.55 (cc)  Cp = 24.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.48 | 9.00 | 30.77 | 10.01 | -2.47 | 6.68 | 5.53 |

clinopyroxene  mass = 6.10 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.94Fe"0.25Mg0.33Fe'"0.05Ti0.40Al0.78Si1.21O6
G = -88851.80 (J)  H = -76776.24 (J)  S = 11.47 (J/K)  V = 1.71 (cc)  Cp = 6.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.39 | 1.67 | 25.04 | 74.46 | 5.83 | -1.10 | 4.50 |

biotite  mass = 0.44 (gm)  density = 2.76 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -7078.70 (J)  H = -6057.76 (J)  S = 0.97 (J/K)  V = 0.16 (cc)  Cp = 0.56 (J/K)

| annite | phlogopite |
|---|---|
| 3.55 | 96.45 |

feldspar  mass = 32.41 (gm)  density = 2.63 (gm/cc)  (analysis in mole %)
K0.04Na0.61Ca0.35Al1.35Si2.65O8
G = -525967.81 (J)  H = -454116.21 (J)  S = 68.23 (J/K)  V = 12.32 (cc)  Cp = 39.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.29 | 34.52 | 4.19 |

apatite  mass = 0.24 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3445.23 (J)  H = -2942.84 (J)  S = 0.48 (J/K)  V = 0.08 (cc)  Cp = 0.26 (J/K)

Total solids  mass = 85.90 (gm)  density = 3.13 (gm/cc)

G = -1279078.10 (J)  H = -1098883.48 (J)  S = 171.10 (J/K)  V = 27.40 (cc)  Cp = 98.13 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.87 (gm)  density = 2.98 (gm/cc)
G = -1505293.69 (J)  H = -1285712.68 (J)  S = 208.50 (J/K)  V = 33.47 (cc)  Cp = 117.54 (J/K)

Oxygen  delta moles = -0.00407599  delta grams = -0.130427
G = 953.20 (J)  H = -100.10 (J)  S = -1.00 (J/K)  V = -356.90 (cc)  Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 770.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -14.54  delta HM = -5.16  NNO = 0.00  QFM = 0.07  COH = 1.37  IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid  mass = 13.60 (gm)  density = 2.30 (gm/cc)  viscosity = 4.53 (log 10 poise)  (analysis in wt %)
G = -220149.36 (J)  H = -182308.56 (J)  S = 36.28 (J/K)  V = 5.92 (cc)  Cp = 18.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.20 | 0.19 | 14.31 | 0.22 | 0.00 | 0.63 | 1.34 | 0.20 | 0.00 | 0.00 | 2.83 | 2.70 | 4.18 | 1.07 | 7.15 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 15.00 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.57Mg0.24)3Al2Si3O12
G = -202174.29 (J)  H = -172821.78 (J)  S = 28.14 (J/K)  V = 3.82 (cc)  Cp = 16.11 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.40 | 18.21 | 24.39 |

orthopyroxene  mass = 9.78 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.91Mg1.00Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -128792.12 (J)  H = -108990.48 (J)  S = 18.98 (J/K)  V = 2.77 (cc)  Cp = 11.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.41 | 96.93 | 91.44 | 4.63 | -4.50 | 5.71 | 0.20 |

clinopyroxene  mass = 21.96 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.86Fe"0.31Mg0.63Fe'"0.04Ti0.04Al0.21Si1.86O6
G = -322314.68 (J)  H = -278161.31 (J)  S = 42.33 (J/K)  V = 6.53 (cc)  Cp = 24.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 41.59 | 8.73 | 30.59 | 9.67 | -2.35 | 6.26 | 5.51 |

clinopyroxene  mass = 6.13 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.94Fe"0.25Mg0.33Fe'"0.04Ti0.40Al0.78Si1.21O6
G = -89274.27 (J)  H = -77317.81 (J)  S = 11.46 (J/K)  V = 1.72 (cc)  Cp = 6.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.71 | 1.57 | 25.09 | 75.07 | 5.82 | -1.40 | 4.56 |

biotite  mass = 0.76 (gm)  density = 2.76 (gm/cc)  (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -12135.96 (J)  H = -10409.68 (J)  S = 1.65 (J/K)  V = 0.28 (cc)  Cp = 0.96 (J/K)

| annite | phlogopite |
|---|---|
| 3.51 | 96.49 |

feldspar mass = 32.40 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.34Al1.34Si2.66O8
G = -524979.39 (J) H = -454208.75 (J) S = 67.84 (J/K) V = 12.32 (cc) Cp = 39.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.09 | 33.78 | 4.13 |

apatite mass = 0.23 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3330.03 (J) H = -2850.93 (J) S = 0.46 (J/K) V = 0.07 (cc) Cp = 0.26 (J/K)

Total solids mass = 86.26 (gm) density = 3.14 (gm/cc)
G = -1283000.75 (J) H = -1104760.73 (J) S = 170.87 (J/K) V = 27.50 (cc) Cp = 98.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 2.99 (gm/cc)
G = -1503150.10 (J) H = -1287069.29 (J) S = 207.14 (J/K) V = 33.42 (cc) Cp = 117.39 (J/K)

Oxygen delta moles = -0.0042012 delta grams = -0.134433
G = 972.17 (J) H = -101.70 (J) S = -1.03 (J/K) V = -364.37 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 760.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = 0.07 COH = 1.34 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 13.28 (gm) density = 2.30 (gm/cc) viscosity = 4.60 (log 10 poise) (analysis in wt %)
G = -214750.96 (J) H = -178323.17 (J) S = 35.26 (J/K) V = 5.78 (cc) Cp = 18.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.77 | 0.18 | 13.91 | 0.20 | 0.00 | 0.57 | 1.37 | 0.19 | 0.00 | 0.00 | 2.85 | 2.56 | 4.05 | 1.12 | 7.23 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.79 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.58Mg0.24)3Al2Si3O12
G = -212111.41 (J) H = -181708.20 (J) S = 29.43 (J/K) V = 4.01 (cc) Cp = 16.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.83 | 18.24 | 23.92 |

orthopyroxene mass = 9.08 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.92Mg0.99Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -119309.74 (J) H = -101202.02 (J) S = 17.53 (J/K) V = 2.57 (cc) Cp = 10.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.93 | 97.05 | 92.08 | 4.49 | -4.37 | 5.49 | 0.19 |

clinopyroxene mass = 21.92 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.86Fe"0.30Mg0.63Fe'"0.04Ti0.04Al0.21Si1.87O6
G = -321619.96 (J) H = -278227.13 (J) S = 42.00 (J/K) V = 6.52 (cc) Cp = 24.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.70 | 8.45 | 30.38 | 9.34 | -2.23 | 5.86 | 5.49 |

clinopyroxene mass = 6.16 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.94Fe"0.25Mg0.33Fe'"0.04Ti0.41Al0.79Si1.20O6
G = -89634.75 (J) H = -77806.72 (J) S = 11.45 (J/K) V = 1.73 (cc) Cp = 6.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.01 | 1.47 | 25.12 | 75.67 | 5.82 | -1.68 | 4.62 |

biotite mass = 1.07 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -16941.98 (J) H = -14565.67 (J) S = 2.30 (J/K) V = 0.39 (cc) Cp = 1.34 (J/K)

| annite | phlogopite |
|---|---|
| 3.45 | 96.55 |

feldspar mass = 32.34 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.63Ca0.33Al1.33Si2.67O8
G = -523465.34 (J) H = -453843.80 (J) S = 67.39 (J/K) V = 12.30 (cc) Cp = 39.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.89 | 33.06 | 4.05 |

apatite mass = 0.22 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3190.65 (J) H = -2737.81 (J) S = 0.44 (J/K) V = 0.07 (cc) Cp = 0.24 (J/K)

Total solids mass = 86.58 (gm) density = 3.14 (gm/cc)
G = -1286273.83 (J) H = -1110091.35 (J) S = 170.53 (J/K) V = 27.59 (cc) Cp = 98.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 2.99 (gm/cc)
G = -1501024.79 (J) H = -1288414.52 (J) S = 205.79 (J/K) V = 33.36 (cc) Cp = 117.28 (J/K)

Oxygen delta moles = -0.00431751 delta grams = -0.138155
G = 988.52 (J) H = -103.00 (J) S = -1.06 (J/K) V = -370.87 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 750.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = 0.06 COH = 1.30 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 10.31 (gm) density = 2.28 (gm/cc) viscosity = 3.96 (log 10 poise) (analysis in wt %)
G = -166763.93 (J) H = -138014.76 (J) S = 28.10 (J/K) V = 4.53 (cc) Cp = 14.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.27 | 0.14 | 13.29 | 0.23 | 0.00 | 0.62 | 1.76 | 0.18 | 0.00 | 0.00 | 3.13 | 3.14 | 3.37 | 1.36 | 8.50 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.11 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.59Mg0.23)3Al2Si3O12
G = -255508.94 (J) H = -219318.38 (J) S = 35.37 (J/K) V = 4.84 (cc) Cp = 20.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.74 | 18.26 | 23.00 |

orthopyroxene mass = 5.30 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.94Mg0.97Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -69217.69 (J) H = -58818.17 (J) S = 10.16 (J/K) V = 1.50 (cc) Cp = 5.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.17 | 97.23 | 94.26 | 4.39 | -4.28 | 5.39 | 0.19 |

clinopyroxene mass = 22.17 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.86Fe"0.31Mg0.62Fe'"0.04Ti0.04Al0.20Si1.87O6
G = -324362.15 (J) H = -281155.56 (J) S = 42.23 (J/K) V = 6.59 (cc) Cp = 24.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.41 | 8.21 | 31.00 | 8.94 | -1.86 | 5.50 | 5.80 |

clinopyroxene mass = 6.21 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.94Fe"0.26Mg0.32Fe'"0.04Ti0.41Al0.78Si1.20O6
G = -90084.01 (J) H = -78350.37 (J) S = 11.47 (J/K) V = 1.74 (cc) Cp = 6.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.68 | 1.39 | 25.70 | 75.57 | 6.16 | -2.07 | 4.93 |

biotite mass = 3.00 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -47552.38 (J) H = -40970.46 (J) S = 6.43 (J/K) V = 1.09 (cc) Cp = 3.77 (J/K)

| annite | phlogopite |
|---|---|
| 3.71 | 96.29 |

feldspar mass = 31.25 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.65Ca0.31Al1.31Si2.69O8
G = -505140.41 (J) H = -438827.99 (J) S = 64.81 (J/K) V = 11.90 (cc) Cp = 38.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.11 | 31.16 | 3.73 |

quartz mass = 2.27 (gm) density = 2.55 (gm/cc)
SiO2
G = -36856.29 (J) H = -32292.68 (J) S = 4.46 (J/K) V = 0.89 (cc) Cp = 2.63 (J/K)

apatite mass = 0.24 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3468.28 (J) H = -2982.77 (J) S = 0.47 (J/K) V = 0.08 (cc) Cp = 0.27 (J/K)

Total solids mass = 89.55 (gm) density = 3.13 (gm/cc)
G = -1332190.15 (J) H = -1152716.39 (J) S = 175.41 (J/K) V = 28.62 (cc) Cp = 102.31 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.01 (gm/cc)
G = -1498954.08 (J) H = -1290731.15 (J) S = 203.51 (J/K) V = 33.15 (cc) Cp = 116.74 (J/K)

Oxygen delta moles = -0.00436298 delta grams = -0.13961
G = 988.26 (J) H = -102.57 (J) S = -1.07 (J/K) V = -371.15 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 740.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = 0.05 COH = 1.27 IW

= 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 7.57 (gm) density = 2.24 (gm/cc) viscosity = 3.00 (log 10 poise) (analysis in wt %)
G = -122594.32 (J) H = -100747.07 (J) S = 21.56 (J/K) V = 3.38 (cc) Cp = 10.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.00 | 0.10 | 12.58 | 0.27 | 0.00 | 0.71 | 2.40 | 0.17 | 0.00 | 0.00 | 3.70 | 3.98 | 2.56 | 1.87 | 10.67 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.02 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.22)3Al2Si3O12
G = -293188.49 (J) H = -252168.47 (J) S = 40.49 (J/K) V = 5.57 (cc) Cp = 23.45 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.55 | 18.26 | 22.19 |

orthopyroxene mass = 2.06 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.96Mg0.96Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -26692.88 (J) H = -22726.10 (J) S = 3.92 (J/K) V = 0.58 (cc) Cp = 2.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.03 | 97.39 | 96.08 | 4.28 | -4.18 | 5.27 | 0.19 |

clinopyroxene mass = 22.42 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.86Fe"0.31Mg0.62Fe'"0.04Ti0.04Al0.20Si1.88O6
G = -327157.20 (J) H = -284154.13 (J) S = 42.44 (J/K) V = 6.66 (cc) Cp = 24.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.27 | 7.97 | 31.44 | 8.55 | -1.51 | 5.17 | 6.12 |

clinopyroxene mass = 6.24 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.26Mg0.31Fe'"0.04Ti0.41Al0.78Si1.20O6
G = -90276.80 (J) H = -78674.60 (J) S = 11.45 (J/K) V = 1.74 (cc) Cp = 6.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.26 | 1.32 | 26.18 | 75.47 | 6.51 | -2.48 | 5.26 |

biotite mass = 4.61 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -72952.69 (J) H = -62991.60 (J) S = 9.83 (J/K) V = 1.67 (cc) Cp = 5.78 (J/K)

| annite | phlogopite |
|---|---|
| 3.92 | 96.08 |

feldspar mass = 30.32 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.67Ca0.29Al1.29Si2.71O8
G = -489568.21 (J) H = -426156.08 (J) S = 62.59 (J/K) V = 11.55 (cc) Cp = 37.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.27 | 29.38 | 3.35 |

quartz mass = 4.39 (gm) density = 2.55 (gm/cc)
SiO2
G = -71049.80 (J) H = -62378.29 (J) S = 8.56 (J/K) V = 1.72 (cc) Cp = 5.08 (J/K)

apatite mass = 0.24 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3429.81 (J) H = -2956.35 (J) S = 0.47 (J/K) V = 0.08 (cc) Cp = 0.26 (J/K)

Total solids mass = 92.29 (gm) density = 3.12 (gm/cc)
G = -1374315.87 (J) H = -1192205.62 (J) S = 179.75 (J/K) V = 29.57 (cc) Cp = 105.51 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.03 (gm/cc)
G = -1496910.19 (J) H = -1292952.69 (J) S = 201.31 (J/K) V = 32.95 (cc) Cp = 116.35 (J/K)

Oxygen delta moles = -0.00440126 delta grams = -0.140835
G = 986.18 (J) H = -101.93 (J) S = -1.07 (J/K) V = -370.75 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 730.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = 0.04 COH = 1.24 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 5.25 (gm) density = 2.18 (gm/cc) viscosity = 1.65 (log 10 poise) (analysis in wt %)
G = -85143.02 (J) H = -69055.46 (J) S = 16.04 (J/K) V = 2.41 (cc) Cp = 7.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.08 | 0.06 | 11.61 | 0.33 | 0.00 | 0.81 | 3.46 | 0.15 | 0.00 | 0.00 | 5.16 | 4.96 | 1.70 | 3.17 | 14.50 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.95 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.60Mg0.21)3Al2Si3O12
G = -317749.26 (J) H = -273866.84 (J) S = 43.74 (J/K) V = 6.05 (cc) Cp = 25.44 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.16 | 18.39 | 21.45 |

clinopyroxene mass = 22.47 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.86Fe"0.32Mg0.61Fe'"0.04Ti0.03Al0.20Si1.88O6
G = -327302.29 (J) H = -284889.58 (J) S = 42.28 (J/K) V = 6.67 (cc) Cp = 24.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.53 | 7.63 | 31.58 | 8.24 | -1.28 | 4.90 | 6.39 |

clinopyroxene mass = 6.27 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.27Mg0.31Fe'"0.04Ti0.41Al0.78Si1.20O6
G = -90527.00 (J) H = -79055.35 (J) S = 11.44 (J/K) V = 1.75 (cc) Cp = 6.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.75 | 1.23 | 26.51 | 75.57 | 6.74 | -2.81 | 5.50 |

biotite mass = 5.71 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -90230.19 (J) H = -78081.74 (J) S = 12.11 (J/K) V = 2.07 (cc) Cp = 7.15 (J/K)

| annite | phlogopite |
|---|---|
| 4.04 | 95.96 |

feldspar mass = 29.97 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.69Ca0.28Al1.28Si2.72O8
G = -483343.22 (J) H = -421605.95 (J) S = 61.54 (J/K) V = 11.43 (cc) Cp = 37.10 (J/K)

albite anorthite sanidine
68.85 28.12 3.03

quartz mass = 6.06 (gm) density = 2.55 (gm/cc)
SiO2
G = -98010.84 (J) H = -86222.33 (J) S = 11.75 (J/K) V = 2.38 (cc) Cp = 7.00 (J/K)

apatite mass = 0.18 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2578.40 (J) H = -2227.47 (J) S = 0.35 (J/K) V = 0.06 (cc) Cp = 0.20 (J/K)

Total solids mass = 94.61 (gm) density = 3.11 (gm/cc)
G = -1409741.19 (J) H = -1225949.26 (J) S = 183.21 (J/K) V = 30.40 (cc) Cp = 108.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.04 (gm/cc)
G = -1494884.21 (J) H = -1295004.71 (J) S = 199.25 (J/K) V = 32.80 (cc) Cp = 116.21 (J/K)

Oxygen delta moles = -0.00444633 delta grams = -0.142277
G = 985.44 (J) H = -101.42 (J) S = -1.08 (J/K) V = -370.85 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 720.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = 0.02 COH = 1.20 IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 3.98 (gm) density = 2.13 (gm/cc) viscosity = 0.47 (log 10 poise) (analysis in wt %)
G = -64485.01 (J) H = -51655.29 (J) S = 12.92 (J/K) V = 1.87 (cc) Cp = 6.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 44.90 | 0.03 | 10.36 | 0.35 | 0.00 | 0.79 | 4.56 | 0.12 | 0.00 | 0.00 | 7.96 | 5.43 | 1.16 | 5.63 | 18.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.14 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.60Mg0.21)3Al2Si3O12
G = -319529.01 (J) H = -276028.36 (J) S = 43.80 (J/K) V = 6.10 (cc) Cp = 25.59 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.39 | 19.08 | 20.53 |

clinopyroxene mass = 21.94 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.86Fe"0.31Mg0.61Fe'"0.04Ti0.03Al0.20Si1.88O6
G = -319460.19 (J) H = -278704.50 (J) S = 41.04 (J/K) V = 6.52 (cc) Cp = 24.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 43.45 | 7.00 | 31.36 | 8.14 | -1.35 | 4.89 | 6.50 |

clinopyroxene mass = 6.34 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.27Mg0.30Fe'"0.04Ti0.41Al0.79Si1.20O6
G = -91436.70 (J) H = -80021.51 (J) S = 11.49 (J/K) V = 1.77 (cc) Cp = 6.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.25 | 1.11 | 26.76 | 76.10 | 6.65 | -2.87 | 5.49 |

biotite mass = 6.18 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -97433.19 (J) H = -84501.14 (J) S = 13.02 (J/K) V = 2.23 (cc) Cp = 7.73 (J/K)

| annite | phlogopite |
|---|---|
| 4.15 | 95.85 |

feldspar mass = 30.42 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.69Ca0.28Al1.28Si2.72O8
G = -490057.68 (J) H = -428390.55 (J) S = 62.09 (J/K) V = 11.59 (cc) Cp = 38.08 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.10 | 28.08 | 2.82 |

quartz mass = 6.80 (gm) density = 2.55 (gm/cc)
SiO2
G = -109857.72 (J) H = -96838.49 (J) S = 13.11 (J/K) V = 2.67 (cc) Cp = 7.85 (J/K)

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -610.43 (J) H = -528.53 (J) S = 0.08 (J/K) V = 0.01 (cc) Cp = 0.05 (J/K)

Total solids mass = 95.88 (gm) density = 3.10 (gm/cc)
G = -1428384.92 (J) H = -1245013.08 (J) S = 184.64 (J/K) V = 30.89 (cc) Cp = 110.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.05 (gm/cc)
G = -1492869.93 (J) H = -1296668.37 (J) S = 197.55 (J/K) V = 32.76 (cc) Cp = 116.48 (J/K)

Oxygen delta moles = -0.004505 delta grams = -0.144155
G = 987.47 (J) H = -101.19 (J) S = -1.10 (J/K) V = -371.99 (cc) Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 710.00 (C) P = 5.000 (kbars) log(10) f O2 = -16.00 delta HM = -5.22 NNO = 0.00 QFM = 0.01 COH = 1.16 IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid mass = 3.39 (gm) density = 2.10 (gm/cc) viscosity = -0.07 (log 10 poise) (analysis in wt %)
G = -54856.80 (J) H = -43722.21 (J) S = 11.33 (J/K) V = 1.61 (cc) Cp = 5.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39.64 | 0.02 | 9.50 | 0.34 | 0.00 | 0.71 | 5.35 | 0.10 | 0.00 | 0.00 | 9.65 | 5.51 | 0.94 | 7.14 | 21.10 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.10 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.20Fe"0.61Mg0.19)3Al2Si3O12
G = -318133.00 (J) H = -275453.12 (J) S = 43.41 (J/K) V = 6.08 (cc) Cp = 25.47 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.61 | 19.94 | 19.45 |

clinopyroxene mass = 20.71 (gm) density = 3.37 (gm/cc) (analysis in mole %)

cpx Na0.07Ca0.87Fe"0.31Mg0.60Fe'"0.03Ti0.03Al0.20Si1.88O6
G = -301083.60 (J) H = -263257.92 (J) S = 38.47 (J/K) V = 6.15 (cc) Cp = 22.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 44.13 | 6.39 | 31.34 | 8.06 | -1.45 | 4.93 | 6.60 |

clinopyroxene mass = 6.47 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.94Fe"0.27Mg0.30Fe'"0.04Ti0.42Al0.79Si1.20O6
G = -93094.95 (J) H = -81644.21 (J) S = 11.65 (J/K) V = 1.80 (cc) Cp = 6.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -13.87 | 0.99 | 27.15 | 76.65 | 6.52 | -2.88 | 5.45 |

amphibole mass = 1.06 (gm) density = 3.06 (gm/cc) (analysis in mole %)
cAph Ca1.79Fe1.38Mg3.83Si8O22(OH)2
G = -15712.62 (J) H = -13713.11 (J) S = 2.03 (J/K) V = 0.35 (cc) Cp = 1.25 (J/K)

| cummingtonite | grunerite | tremolite |
|---|---|---|
| -9.03 | 19.71 | 89.32 |

biotite mass = 6.33 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -99710.33 (J) H = -86662.25 (J) S = 13.27 (J/K) V = 2.29 (cc) Cp = 7.91 (J/K)

| annite | phlogopite |
|---|---|
| 4.36 | 95.64 |

feldspar mass = 30.87 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.69Ca0.28Al1.28Si2.72O8
G = -496575.78 (J) H = -435031.94 (J) S = 62.60 (J/K) V = 11.76 (cc) Cp = 39.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.14 | 28.13 | 2.72 |

quartz mass = 6.93 (gm) density = 2.55 (gm/cc)
SiO2
G = -111696.12 (J) H = -98656.11 (J) S = 13.26 (J/K) V = 2.72 (cc) Cp = 7.98 (J/K)

Total solids mass = 96.46 (gm) density = 3.10 (gm/cc)
G = -1436006.40 (J) H = -1254418.67 (J) S = 184.70 (J/K) V = 31.14 (cc) Cp = 111.43 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.85 (gm) density = 3.05 (gm/cc)
G = -1490863.20 (J) H = -1298140.88 (J) S = 196.03 (J/K) V = 32.75 (cc) Cp = 116.93 (J/K)

Oxygen delta moles = -0.00458001 delta grams = -0.146555
G = 992.78 (J) H = -101.29 (J) S = -1.11 (J/K) V = -374.38 (cc) Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 700.00 (C) P = 5.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = 0.00 COH = 1.13 IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 3.00 (gm) density = 2.09 (gm/cc) viscosity = -0.39 (log 10 poise) (analysis in wt %)
G = -48326.94 (J) H = -38430.56 (J) S = 10.17 (J/K) V = 1.43 (cc) Cp = 4.94 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
36.18 0.01 8.89 0.31 0.00 0.63 6.06 0.08 0.00 0.00 10.70 5.46 0.83 8.08 22.77 0.00 0.00 0.00 0.00

garnet mass = 23.95 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.21Fe"0.61Mg0.18)3Al2Si3O12
G = -315446.34 (J) H = -273760.87 (J) S = 42.84 (J/K) V = 6.04 (cc) Cp = 25.25 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.77 | 20.92 | 18.31 |

clinopyroxene mass = 19.17 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.87Fe"0.31Mg0.59Fe'"0.03Ti0.03Al0.20Si1.89O6
G = -278217.61 (J) H = -243792.75 (J) S = 35.37 (J/K) V = 5.69 (cc) Cp = 21.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 44.61 | 5.82 | 31.46 | 7.99 | -1.57 | 5.01 | 6.70 |

clinopyroxene mass = 6.62 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.94Fe"0.28Mg0.29Fe'"0.04Ti0.42Al0.80Si1.19O6
G = -95026.88 (J) H = -83511.18 (J) S = 11.83 (J/K) V = 1.84 (cc) Cp = 7.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -14.60 | 0.87 | 27.63 | 77.20 | 6.38 | -2.86 | 5.38 |

amphibole mass = 2.53 (gm) density = 3.06 (gm/cc) (analysis in mole %)
cAph Ca1.81Fe1.39Mg3.80Si8O22(OH)2
G = -37523.27 (J) H = -32819.30 (J) S = 4.83 (J/K) V = 0.83 (cc) Cp = 2.98 (J/K)

| cummingtonite | grunerite | tremolite |
|---|---|---|
| -10.31 | 19.85 | 90.45 |

biotite mass = 6.40 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.05Mg0.95)3AlSi3O10(OH)2
G = -100470.27 (J) H = -87506.94 (J) S = 13.32 (J/K) V = 2.31 (cc) Cp = 7.98 (J/K)

| annite | phlogopite |
|---|---|
| 4.65 | 95.35 |

feldspar mass = 31.33 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.69Ca0.28Al1.28Si2.72O8
G = -503426.22 (J) H = -441994.35 (J) S = 63.13 (J/K) V = 11.93 (cc) Cp = 40.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.07 | 28.24 | 2.69 |

quartz mass = 6.86 (gm) density = 2.55 (gm/cc)
SiO2
G = -110431.64 (J) H = -97733.75 (J) S = 13.05 (J/K) V = 2.69 (cc) Cp = 7.88 (J/K)

Total solids mass = 96.85 (gm) density = 3.09 (gm/cc)
G = -1440542.22 (J) H = -1261119.14 (J) S = 184.37 (J/K) V = 31.32 (cc) Cp = 112.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.85 (gm) density = 3.05 (gm/cc)
G = -1488869.16 (J) H = -1299549.70 (J) S = 194.54 (J/K) V = 32.76 (cc) Cp = 117.47 (J/K)

Oxygen delta moles = -0.00465966 delta grams = -0.149103

G = 998.73 (J)  H = -101.43 (J)  S = -1.13 (J/K)  V = -377.02 (cc)  Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.65 (gm/cc)  viscosity = 2.02 (log 10 poise)  (analysis in wt %)
G = -1631532.91 (J)  H = -1184773.40 (J)  S = 283.99 (J/K)  V = 37.74 (cc)  Cp = 148.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.75 | 0.00 | 8.33 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.02 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.65 (gm/cc)
G = -1631532.91 (J)  H = -1184773.40 (J)  S = 283.99 (J/K)  V = 37.74 (cc)  Cp = 148.91 (J/K)

Oxygen  delta moles = -6.59195e-17  delta grams = -2.10934e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: mafic

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.65 (gm/cc)  viscosity = 2.06 (log 10 poise)  (analysis in wt %)
G = -1628701.29 (J)  H = -1186265.32 (J)  S = 283.04 (J/K)  V = 37.71 (cc)  Cp = 148.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.75 | 0.00 | 8.32 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.06 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.65 (gm/cc)
G = -1628701.29 (J)  H = -1186265.32 (J)  S = 283.04 (J/K)  V = 37.71 (cc)  Cp = 148.90 (J/K)

Oxygen  delta moles = 6.40626e-06  delta grams = 0.000204993
G = -2.32 (J)  H = 0.27 (J)  S = 0.00 (J/K)  V = 0.83 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.65 (gm/cc)  viscosity = 2.10 (log 10 poise)  (analysis in wt %)
G = -1625879.58 (J)  H = -1187757.52 (J)  S = 282.09 (J/K)  V = 37.67 (cc)  Cp = 148.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.75 | 0.00 | 8.32 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.10 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.65 (gm/cc)
G = -1625879.58 (J)  H = -1187757.52 (J)  S = 282.09 (J/K)  V = 37.67 (cc)  Cp = 148.89 (J/K)

Oxygen  delta moles = 1.35403e-05  delta grams = 0.000433275
G = -4.88 (J)  H = 0.58 (J)  S = 0.00 (J/K)  V = 1.75 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.66 (gm/cc)  viscosity = 2.14 (log 10 poise)  (analysis in wt %)
G = -1623067.87 (J)  H = -1189250.00 (J)  S = 281.12 (J/K)  V = 37.64 (cc)  Cp = 148.89 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.75 | 0.00 | 8.32 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.14 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.66 (gm/cc)
G = -1623067.87 (J)  H = -1189250.00 (J)  S = 281.12 (J/K)  V = 37.64 (cc)  Cp = 148.89 (J/K)

Oxygen  delta moles = 2.14227e-05  delta grams = 0.000685501
G = -7.66 (J)  H = 0.90 (J)  S = 0.01 (J/K)  V = 2.75 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.66 (gm/cc)  viscosity = 2.19 (log 10 poise)  (analysis in wt %)
G = -1620266.22 (J)  H = -1190742.78 (J)  S = 280.16 (J/K)  V = 37.61 (cc)  Cp = 148.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.76 | 0.00 | 8.32 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.19 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.66 (gm/cc)
G = -1620266.22 (J)  H = -1190742.78 (J)  S = 280.16 (J/K)  V = 37.61 (cc)  Cp = 148.88 (J/K)

Oxygen  delta moles = 3.00747e-05  delta grams = 0.000962355
G = -10.68 (J)  H = 1.26 (J)  S = 0.01 (J/K)  V = 3.83 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.66 (gm/cc)  viscosity = 2.23 (log 10 poise)  (analysis in wt %)
G = -1617474.70 (J)  H = -1192235.88 (J)  S = 279.18 (J/K)  V = 37.58 (cc)  Cp = 148.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.76 | 0.00 | 8.31 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.23 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.66 (gm/cc)
G = -1617474.70 (J)  H = -1192235.88 (J)  S = 279.18 (J/K)  V = 37.58 (cc)  Cp = 148.87 (J/K)

Oxygen  delta moles = 3.95186e-05  delta grams = 0.00126455
G = -13.93 (J)  H = 1.64 (J)  S = 0.01 (J/K)  V = 5.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.66 (gm/cc) viscosity = 2.27 (log 10 poise) (analysis in wt %)
G = -1614693.39 (J) H = -1193729.31 (J) S = 278.20 (J/K) V = 37.54 (cc) Cp = 148.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.76 | 0.00 | 8.31 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 2.27 (log 10 poise)

System mass = 100.00 (gm) density = 2.66 (gm/cc)
G = -1614693.39 (J) H = -1193729.31 (J) S = 278.20 (J/K) V = 37.54 (cc) Cp = 148.87 (J/K)

Oxygen delta moles = 4.97775e-05 delta grams = 0.00159282
G = -17.42 (J) H = 2.04 (J) S = 0.01 (J/K) V = 6.26 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.67 (gm/cc) viscosity = 2.32 (log 10 poise) (analysis in wt %)
G = -1611922.36 (J) H = -1195223.08 (J) S = 277.22 (J/K) V = 37.51 (cc) Cp = 148.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.77 | 0.00 | 8.31 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 2.32 (log 10 poise)

System mass = 100.00 (gm) density = 2.67 (gm/cc)
G = -1611922.36 (J) H = -1195223.08 (J) S = 277.22 (J/K) V = 37.51 (cc) Cp = 148.86 (J/K)

Oxygen delta moles = 6.08757e-05 delta grams = 0.00194795
G = -21.14 (J) H = 2.48 (J) S = 0.02 (J/K) V = 7.61 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 96.64 (gm) density = 2.66 (gm/cc) viscosity = 2.39 (log 10 poise) (analysis in wt %)
G = -1555386.53 (J) H = -1156316.20 (J) S = 267.27 (J/K) V = 36.29 (cc) Cp = 143.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.09 | 1.19 | 16.27 | 1.77 | 0.00 | 8.35 | 0.19 | 5.31 | 0.00 | 0.00 | 9.64 | 2.99 | 0.92 | 0.25 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 3.36 (gm) density = 3.25 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.70Fe"0.22Mg0.91Fe'"0.05Ti0.01Al0.22Si1.86O6
G = -53781.78 (J) H = -41849.65 (J) S = 7.99 (J/K) V = 1.03 (cc) Cp = 4.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.69 | 27.84 | 21.75 | 8.25 | -6.27 | 11.77 | 1.98 |

Total solids mass = 3.36 (gm) density = 3.25 (gm/cc)
G = -53781.78 (J) H = -41849.65 (J) S = 7.99 (J/K) V = 1.03 (cc) Cp = 4.01 (J/K)

Viscosity of the System: 2.44 (log 10 poise)

System mass = 100.00 (gm) density = 2.68 (gm/cc)
G = -1609168.31 (J) H = -1198165.85 (J) S = 275.26 (J/K) V = 37.32 (cc) Cp = 147.58 (J/K)

Oxygen delta moles = 7.77303e-05 delta grams = 0.00248728
G = -26.79 (J) H = 3.14 (J) S = 0.02 (J/K) V = 9.65 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 92.71 (gm) density = 2.66 (gm/cc) viscosity = 2.48 (log 10 poise) (analysis in wt %)
G = -1490191.37 (J) H = -1110706.81 (J) S = 255.86 (J/K) V = 34.88 (cc) Cp = 137.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.18 | 1.22 | 16.72 | 1.76 | 0.00 | 8.37 | 0.20 | 4.87 | 0.00 | 0.00 | 9.28 | 3.10 | 0.96 | 0.26 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 7.29 (gm) density = 3.26 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.71Fe"0.22Mg0.89Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -116254.82 (J) H = -90637.20 (J) S = 17.27 (J/K) V = 2.24 (cc) Cp = 8.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.59 | 27.06 | 22.45 | 8.89 | -6.60 | 12.49 | 2.14 |

Total solids mass = 7.29 (gm) density = 3.26 (gm/cc)
G = -116254.82 (J) H = -90637.20 (J) S = 17.27 (J/K) V = 2.24 (cc) Cp = 8.67 (J/K)

Viscosity of the System: 2.59 (log 10 poise)

System mass = 100.00 (gm) density = 2.69 (gm/cc)
G = -1606446.19 (J) H = -1201344.01 (J) S = 273.14 (J/K) V = 37.11 (cc) Cp = 146.10 (J/K)

Oxygen delta moles = 0.000113569 delta grams = 0.00363407
G = -38.86 (J) H = 4.54 (J) S = 0.03 (J/K) V = 14.00 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 89.06 (gm) density = 2.65 (gm/cc) viscosity = 2.56 (log 10 poise) (analysis in wt %)
G = -1430027.87 (J) H = -1068660.84 (J) S = 245.30 (J/K) V = 33.57 (cc) Cp = 127.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.30 | 1.25 | 17.14 | 1.75 | 0.00 | 8.37 | 0.20 | 4.46 | 0.00 | 0.00 | 8.92 | 3.21 | 1.00 | 0.27 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 10.94 (gm) density = 3.27 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.71Fe"0.23Mg0.87Fe'"0.06Ti0.01Al0.25Si1.84O6
G = -173725.96 (J) H = -135697.25 (J) S = 25.81 (J/K) V = 3.35 (cc) Cp = 12.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.13 | 26.55 | 23.24 | 9.52 | -6.91 | 13.17 | 2.30 |

Total solids mass = 10.94 (gm) density = 3.27 (gm/cc)
G = -173725.96 (J) H = -135697.25 (J) S = 25.81 (J/K) V = 3.35 (cc) Cp = 12.97 (J/K)

Viscosity of the System: 2.74 (log 10 poise)

System mass = 100.01 (gm) density = 2.71 (gm/cc)
G = -1603753.83 (J) H = -1204358.10 (J) S = 271.12 (J/K) V = 36.91 (cc) Cp = 140.95 (J/K)

Oxygen delta moles = 0.000165771 delta grams = 0.00530448
G = -56.29 (J) H = 6.57 (J) S = 0.04 (J/K) V = 20.30 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 85.66 (gm) density = 2.65 (gm/cc) viscosity = 2.65 (log 10 poise) (analysis in wt %)
G = -1374301.02 (J) H = -1029768.79 (J) S = 235.47 (J/K) V = 32.35 (cc) Cp = 122.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.46 | 1.27 | 17.54 | 1.73 | 0.00 | 8.34 | 0.21 | 4.08 | 0.00 | 0.00 | 8.55 | 3.32 | 1.04 | 0.28 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 14.34 (gm) density = 3.28 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.71Fe"0.24Mg0.84Fe'"0.07Ti0.01Al0.26Si1.83O6
G = -226787.63 (J) H = -177467.94 (J) S = 33.71 (J/K) V = 4.38 (cc) Cp = 16.95 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
30.45 26.22 24.10 10.15 -7.19 13.82 2.46

Total solids mass = 14.34 (gm) density = 3.28 (gm/cc)
G = -226787.63 (J) H = -177467.94 (J) S = 33.71 (J/K) V = 4.38 (cc) Cp = 16.95 (J/K)

Viscosity of the System: 2.89 (log 10 poise)

System mass = 100.01 (gm) density = 2.72 (gm/cc)
G = -1601088.64 (J) H = -1207236.73 (J) S = 269.18 (J/K) V = 36.73 (cc) Cp = 139.73 (J/K)

Oxygen delta moles = 0.000231488 delta grams = 0.00740735
G = -78.01 (J) H = 9.08 (J) S = 0.06 (J/K) V = 28.16 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 82.48 (gm) density = 2.64 (gm/cc) viscosity = 2.74 (log 10 poise) (analysis in wt %)
G = -1322530.23 (J) H = -993699.22 (J) S = 226.29 (J/K) V = 31.22 (cc) Cp = 117.93 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
52.65 1.28 17.92 1.71 0.00 8.27 0.22 3.73 0.00 0.00 8.20 3.43 1.08 0.29 1.22 0.00 0.00 0.00 0.00

clinopyroxene mass = 17.53 (gm) density = 3.28 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.71Fe"0.25Mg0.82Fe'"0.07Ti0.02Al0.28Si1.82O6
G = -275918.17 (J) H = -216304.36 (J) S = 41.02 (J/K) V = 5.34 (cc) Cp = 20.66 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
28.61 26.02 24.99 10.76 -7.45 14.43 2.63

Total solids mass = 17.53 (gm) density = 3.28 (gm/cc)
G = -275918.17 (J) H = -216304.36 (J) S = 41.02 (J/K) V = 5.34 (cc) Cp = 20.66 (J/K)

Viscosity of the System: 3.04 (log 10 poise)

System mass = 100.01 (gm) density = 2.74 (gm/cc)
G = -1598448.41 (J) H = -1210003.58 (J) S = 267.31 (J/K) V = 36.55 (cc) Cp = 138.58 (J/K)

Oxygen delta moles = 0.000308047 delta grams = 0.00985714
G = -103.02 (J) H = 11.98 (J) S = 0.08 (J/K) V = 37.22 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 79.50 (gm) density = 2.64 (gm/cc) viscosity = 2.84 (log 10 poise) (analysis in wt %)
G = -1274317.72 (J) H = -960167.30 (J) S = 217.68 (J/K) V = 30.16 (cc) Cp = 113.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.86 | 1.29 | 18.27 | 1.68 | 0.00 | 8.18 | 0.23 | 3.41 | 0.00 | 0.00 | 7.84 | 3.54 | 1.12 | 0.30 | 1.27 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 20.51 (gm) density = 3.29 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.71Fe"0.26Mg0.80Fe'''0.07Ti0.02Al0.29Si1.81O6
G = -321513.27 (J) H = -252501.16 (J) S = 47.82 (J/K) V = 6.23 (cc) Cp = 24.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.67 | 25.92 | 25.92 | 11.37 | -7.69 | 15.01 | 2.81 |

Total solids mass = 20.51 (gm) density = 3.29 (gm/cc)
G = -321513.27 (J) H = -252501.16 (J) S = 47.82 (J/K) V = 6.23 (cc) Cp = 24.11 (J/K)

Viscosity of the System: 3.20 (log 10 poise)

System mass = 100.01 (gm) density = 2.75 (gm/cc)
G = -1595830.98 (J) H = -1212668.46 (J) S = 265.50 (J/K) V = 36.39 (cc) Cp = 137.51 (J/K)

Oxygen delta moles = 0.000392755 delta grams = 0.0125677
G = -130.34 (J) H = 15.13 (J) S = 0.10 (J/K) V = 47.13 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 76.70 (gm) density = 2.63 (gm/cc) viscosity = 2.93 (log 10 poise) (analysis in wt %)
G = -1229334.18 (J) H = -928936.92 (J) S = 209.61 (J/K) V = 29.17 (cc) Cp = 109.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.11 | 1.29 | 18.61 | 1.65 | 0.00 | 8.05 | 0.24 | 3.12 | 0.00 | 0.00 | 7.49 | 3.65 | 1.16 | 0.32 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 23.31 (gm) density = 3.30 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.71Fe"0.27Mg0.78Fe'''0.08Ti0.02Al0.31Si1.80O6
G = -363900.08 (J) H = -286302.56 (J) S = 54.14 (J/K) V = 7.06 (cc) Cp = 27.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.65 | 25.89 | 26.86 | 11.96 | -7.92 | 15.56 | 2.99 |

Total solids mass = 23.31 (gm) density = 3.30 (gm/cc)
G = -363900.08 (J) H = -286302.56 (J) S = 54.14 (J/K) V = 7.06 (cc) Cp = 27.33 (J/K)

Viscosity of the System: 3.36 (log 10 poise)

System mass = 100.02 (gm) density = 2.76 (gm/cc)
G = -1593234.26 (J) H = -1215239.48 (J) S = 263.75 (J/K) V = 36.23 (cc) Cp = 136.51 (J/K)

Oxygen delta moles = 0.000482851 delta grams = 0.0154506

G = -158.99 (J)  H = 18.42 (J)  S = 0.12 (J/K)  V = 57.53 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1150.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.26  COH = 2.15  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 74.07 (gm)  density = 2.62 (gm/cc)  viscosity = 3.03 (log 10 poise)  (analysis in wt %)
G = -1187306.62 (J)  H = -899812.03 (J)  S = 202.01 (J/K)  V = 28.24 (cc)  Cp = 105.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.38 | 1.29 | 18.92 | 1.62 | 0.00 | 7.89 | 0.25 | 2.85 | 0.00 | 0.00 | 7.16 | 3.76 | 1.20 | 0.33 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 25.95 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
cpx Na0.03Ca0.71Fe"0.28Mg0.77Fe'"0.08Ti0.02Al0.32Si1.80O6
G = -403349.55 (J)  H = -317911.22 (J)  S = 60.03 (J/K)  V = 7.84 (cc)  Cp = 30.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.59 | 25.93 | 27.82 | 12.54 | -8.12 | 16.07 | 3.18 |

Total solids  mass = 25.95 (gm)  density = 3.31 (gm/cc)
G = -403349.55 (J)  H = -317911.22 (J)  S = 60.03 (J/K)  V = 7.84 (cc)  Cp = 30.34 (J/K)

Viscosity of the System: 3.53 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.77 (gm/cc)
G = -1590656.16 (J)  H = -1217723.26 (J)  S = 262.05 (J/K)  V = 36.09 (cc)  Cp = 135.57 (J/K)

Oxygen  delta moles = 0.000575514  delta grams = 0.0184158
G = -188.03 (J)  H = 21.74 (J)  S = 0.15 (J/K)  V = 68.10 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1140.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.26  COH = 2.13  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 70.29 (gm)  density = 2.62 (gm/cc)  viscosity = 3.11 (log 10 poise)  (analysis in wt %)
G = -1125777.40 (J)  H = -855227.09 (J)  S = 191.45 (J/K)  V = 26.87 (cc)  Cp = 99.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.66 | 1.31 | 18.99 | 1.60 | 0.00 | 7.83 | 0.26 | 2.63 | 0.00 | 0.00 | 6.82 | 3.85 | 1.26 | 0.34 | 1.44 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 28.16 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
cpx Na0.03Ca0.70Fe"0.29Mg0.76Fe'"0.08Ti0.02Al0.32Si1.79O6
G = -435580.04 (J)  H = -343828.38 (J)  S = 64.93 (J/K)  V = 8.49 (cc)  Cp = 32.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.46 | 27.04 | 29.33 | 12.75 | -8.03 | 16.16 | 3.30 |

feldspar mass = 1.57 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.33Ca0.66Al1.66Si2.34O8
G = -26704.94 (J) H = -21362.66 (J) S = 3.78 (J/K) V = 0.59 (cc) Cp = 1.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.26 | 66.00 | 0.74 |

Total solids mass = 29.73 (gm) density = 3.28 (gm/cc)
G = -462284.98 (J) H = -365191.04 (J) S = 68.71 (J/K) V = 9.08 (cc) Cp = 34.78 (J/K)

Viscosity of the System: 3.72 (log 10 poise)

System mass = 100.02 (gm) density = 2.78 (gm/cc)
G = -1588062.38 (J) H = -1220418.14 (J) S = 260.16 (J/K) V = 35.95 (cc) Cp = 134.44 (J/K)

Oxygen delta moles = 0.000607653 delta grams = 0.0194442
G = -196.98 (J) H = 22.74 (J) S = 0.16 (J/K) V = 71.40 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 65.98 (gm) density = 2.61 (gm/cc) viscosity = 3.17 (log 10 poise) (analysis in wt %)
G = -1055513.29 (J) H = -803558.29 (J) S = 179.56 (J/K) V = 25.29 (cc) Cp = 93.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.94 | 1.35 | 18.92 | 1.60 | 0.00 | 7.79 | 0.28 | 2.43 | 0.00 | 0.00 | 6.51 | 3.94 | 1.34 | 0.37 | 1.53 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 29.36 (gm) density = 3.33 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.69Fe"0.31Mg0.75Fe'"0.08Ti0.03Al0.32Si1.79O6
G = -451811.06 (J) H = -357198.91 (J) S = 67.43 (J/K) V = 8.83 (cc) Cp = 34.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.81 | 27.84 | 30.76 | 12.86 | -7.78 | 16.08 | 3.42 |

clinopyroxene mass = 0.73 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.27Fe"0.53Mg1.03Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -10891.43 (J) H = -8506.42 (J) S = 1.70 (J/K) V = 0.22 (cc) Cp = 0.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -41.89 | 71.79 | 52.54 | 10.02 | -8.17 | 14.18 | 1.53 |

feldspar mass = 3.95 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.35Ca0.65Al1.65Si2.35O8
G = -67249.49 (J) H = -53906.53 (J) S = 9.51 (J/K) V = 1.48 (cc) Cp = 4.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.68 | 64.52 | 0.80 |

Total solids mass = 34.04 (gm) density = 3.23 (gm/cc)
G = -529951.97 (J) H = -419611.87 (J) S = 78.64 (J/K) V = 10.53 (cc) Cp = 39.88 (J/K)

Viscosity of the System: 3.94 (log 10 poise)

System mass = 100.02 (gm) density = 2.79 (gm/cc)
G = -1585465.26 (J) H = -1223170.15 (J) S = 258.20 (J/K) V = 35.82 (cc) Cp = 133.25 (J/K)

Oxygen delta moles = 0.000598067 delta grams = 0.0191374
G = -192.34 (J) H = 22.16 (J) S = 0.15 (J/K) V = 69.77 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1120.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.25 COH = 2.09 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 61.73 (gm) density = 2.60 (gm/cc) viscosity = 3.23 (log 10 poise) (analysis in wt %)
G = -986694.27 (J) H = -752788.09 (J) S = 167.90 (J/K) V = 23.74 (cc) Cp = 87.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.24 | 1.38 | 18.82 | 1.59 | 0.00 | 7.69 | 0.29 | 2.22 | 0.00 | 0.00 | 6.27 | 4.03 | 1.42 | 0.39 | 1.64 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 28.86 (gm) density = 3.33 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.70Fe"0.31Mg0.73Fe'"0.09Ti0.03Al0.33Si1.78O6
G = -442395.73 (J) H = -350492.72 (J) S = 65.97 (J/K) V = 8.66 (cc) Cp = 33.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.58 | 26.74 | 31.26 | 13.21 | -7.43 | 16.05 | 3.59 |

clinopyroxene mass = 3.02 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.26Fe"0.55Mg1.01Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -44918.91 (J) H = -35132.86 (J) S = 7.02 (J/K) V = 0.90 (cc) Cp = 3.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -44.91 | 72.51 | 54.71 | 10.01 | -8.07 | 14.20 | 1.55 |

feldspar mass = 6.41 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.36Ca0.63Al1.63Si2.37O8
G = -108872.61 (J) H = -87452.28 (J) S = 15.38 (J/K) V = 2.40 (cc) Cp = 7.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.95 | 63.18 | 0.86 |

Total solids mass = 38.29 (gm) density = 3.20 (gm/cc)
G = -596187.25 (J) H = -473077.85 (J) S = 88.37 (J/K) V = 11.96 (cc) Cp = 44.90 (J/K)

Viscosity of the System: 4.19 (log 10 poise)

System mass = 100.02 (gm) density = 2.80 (gm/cc)
G = -1582881.52 (J) H = -1225865.95 (J) S = 256.26 (J/K) V = 35.70 (cc) Cp = 132.10 (J/K)

Oxygen delta moles = 0.00057715 delta grams = 0.0184681
G = -184.14 (J) H = 21.18 (J) S = 0.15 (J/K) V = 66.85 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1110.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.24  COH = 2.07  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 57.83 (gm)  density = 2.59 (gm/cc)  viscosity = 3.29 (log 10 poise)  (analysis in wt %)
G = -923884.49 (J)  H = -706443.24 (J)  S = 157.21 (J/K)  V = 22.32 (cc)  Cp = 81.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.56 | 1.41 | 18.73 | 1.58 | 0.00 | 7.56 | 0.31 | 2.04 | 0.00 | 0.00 | 6.04 | 4.10 | 1.51 | 0.42 | 1.75 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 28.43 (gm)  density = 3.34 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.71Fe"0.32Mg0.71Fe'"0.09Ti0.03Al0.33Si1.77O6
G = -434228.29 (J)  H = -344762.28 (J)  S = 64.68 (J/K)  V = 8.51 (cc)  Cp = 32.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.40 | 25.62 | 31.69 | 13.60 | -7.06 | 15.99 | 3.76 |

clinopyroxene  mass = 5.11 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.25Fe"0.57Mg1.00Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -75358.13 (J)  H = -59027.45 (J)  S = 11.81 (J/K)  V = 1.51 (cc)  Cp = 6.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -47.87 | 73.24 | 56.85 | 9.99 | -7.99 | 14.21 | 1.56 |

feldspar  mass = 8.65 (gm)  density = 2.66 (gm/cc)  (analysis in mole %)
K0.01Na0.37Ca0.62Al1.62Si2.38O8
G = -146843.71 (J)  H = -118198.11 (J)  S = 20.71 (J/K)  V = 3.25 (cc)  Cp = 10.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.19 | 61.88 | 0.93 |

Total solids  mass = 42.19 (gm)  density = 3.18 (gm/cc)
G = -656430.13 (J)  H = -521987.85 (J)  S = 97.20 (J/K)  V = 13.27 (cc)  Cp = 49.49 (J/K)

Viscosity of the System: 4.48 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.81 (gm/cc)
G = -1580314.62 (J)  H = -1228431.09 (J)  S = 254.41 (J/K)  V = 35.59 (cc)  Cp = 131.04 (J/K)

Oxygen  delta moles = 0.000552323  delta grams = 0.0176737
G = -174.81 (J)  H = 20.07 (J)  S = 0.14 (J/K)  V = 63.52 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1100.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.23  COH = 2.05  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 54.23 (gm)  density = 2.58 (gm/cc)  viscosity = 3.35 (log 10 poise)  (analysis in wt %)
G = -866315.39 (J)  H = -663949.11 (J)  S = 147.37 (J/K)  V = 21.01 (cc)  Cp = 76.38 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

54.88 1.42 18.66 1.56 0.00 7.38 0.34 1.86 0.00 0.00 5.83 4.17 1.60 0.45 1.86 0.00 0.00 0.00 0.00

clinopyroxene mass = 28.07 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.72Fe"0.32Mg0.69Fe'"0.09Ti0.04Al0.34Si1.77O6
G = -427140.28 (J) H = -339879.43 (J) S = 63.55 (J/K) V = 8.39 (cc) Cp = 32.37 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
16.28 24.49 32.03 14.04 -6.67 15.90 3.93

clinopyroxene mass = 7.00 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.24Fe"0.59Mg0.98Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -102655.91 (J) H = -80531.96 (J) S = 16.11 (J/K) V = 2.07 (cc) Cp = 8.23 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-50.76 73.97 58.95 9.97 -7.91 14.20 1.57

feldspar mass = 10.72 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.38Ca0.61Al1.61Si2.39O8
G = -181651.44 (J) H = -146520.88 (J) S = 25.58 (J/K) V = 4.03 (cc) Cp = 13.10 (J/K)
albite anorthite sanidine
38.38 60.63 1.00

Total solids mass = 45.78 (gm) density = 3.16 (gm/cc)
G = -711447.63 (J) H = -566932.26 (J) S = 105.24 (J/K) V = 14.48 (cc) Cp = 53.69 (J/K)

Viscosity of the System: 4.82 (log 10 poise)

System mass = 100.02 (gm) density = 2.82 (gm/cc)
G = -1577763.02 (J) H = -1230881.37 (J) S = 252.62 (J/K) V = 35.49 (cc) Cp = 130.07 (J/K)

Oxygen delta moles = 0.00052209 delta grams = 0.0167062
G = -163.91 (J) H = 18.78 (J) S = 0.13 (J/K) V = 59.61 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 50.91 (gm) density = 2.57 (gm/cc) viscosity = 3.41 (log 10 poise) (analysis in wt %)
G = -813382.89 (J) H = -624854.24 (J) S = 138.30 (J/K) V = 19.80 (cc) Cp = 71.62 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
55.22 1.42 18.59 1.53 0.00 7.17 0.36 1.71 0.00 0.00 5.62 4.23 1.70 0.48 1.98 0.00 0.00 0.00 0.00

clinopyroxene mass = 27.75 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.73Fe"0.32Mg0.67Fe'"0.10Ti0.04Al0.34Si1.76O6
G = -420961.68 (J) H = -335713.57 (J) S = 62.54 (J/K) V = 8.28 (cc) Cp = 31.91 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
16.20 23.36 32.30 14.54 -6.26 15.76 4.09

clinopyroxene mass = 8.73 (gm) density = 3.39 (gm/cc) (analysis in mole %)

cpx Na0.02Ca0.24Fe"0.61Mg0.97Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -127179.12 (J) H = -99927.40 (J) S = 19.99 (J/K) V = 2.57 (cc) Cp = 10.22 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-53.55 74.70 60.99 9.94 -7.83 14.17 1.58

feldspar mass = 12.63 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.40Ca0.59Al1.59Si2.41O8
G = -213701.56 (J) H = -172733.55 (J) S = 30.05 (J/K) V = 4.75 (cc) Cp = 15.42 (J/K)
albite anorthite sanidine
39.52 59.41 1.07

Total solids mass = 49.11 (gm) density = 3.15 (gm/cc)
G = -761842.36 (J) H = -608374.51 (J) S = 112.58 (J/K) V = 15.60 (cc) Cp = 57.55 (J/K)

Viscosity of the System: 5.26 (log 10 poise)

System mass = 100.02 (gm) density = 2.83 (gm/cc)
G = -1575225.25 (J) H = -1233228.75 (J) S = 250.89 (J/K) V = 35.39 (cc) Cp = 129.17 (J/K)

Oxygen delta moles = 0.000484905 delta grams = 0.0155164
G = -151.00 (J) H = 17.27 (J) S = 0.12 (J/K) V = 54.96 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1080.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.22 COH = 2.01 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 47.83 (gm) density = 2.56 (gm/cc) viscosity = 3.46 (log 10 poise) (analysis in wt %)
G = -764609.11 (J) H = -588801.99 (J) S = 129.92 (J/K) V = 18.68 (cc) Cp = 67.23 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
55.56 1.41 18.54 1.49 0.00 6.93 0.38 1.57 0.00 0.00 5.43 4.28 1.80 0.51 2.11 0.00 0.00 0.00 0.00

clinopyroxene mass = 27.48 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.74Fe"0.32Mg0.65Fe'"0.10Ti0.05Al0.35Si1.75O6
G = -415534.68 (J) H = -332142.57 (J) S = 61.63 (J/K) V = 8.18 (cc) Cp = 31.50 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
16.16 22.24 32.49 15.09 -5.82 15.58 4.25

clinopyroxene mass = 10.30 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.23Fe"0.63Mg0.96Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -149223.99 (J) H = -117440.71 (J) S = 23.49 (J/K) V = 3.03 (cc) Cp = 12.03 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-56.21 75.41 62.96 9.89 -7.77 14.13 1.58

feldspar mass = 14.40 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.41Ca0.58Al1.58Si2.42O8
G = -243332.19 (J) H = -197096.92 (J) S = 34.17 (J/K) V = 5.42 (cc) Cp = 17.57 (J/K)
albite anorthite sanidine
40.61 58.24 1.15

Total solids mass = 52.18 (gm) density = 3.14 (gm/cc)
G = -808090.85 (J) H = -646680.20 (J) S = 119.29 (J/K) V = 16.62 (cc) Cp = 61.10 (J/K)

Viscosity of the System: 5.93 (log 10 poise)

System mass = 100.01 (gm) density = 2.83 (gm/cc)
G = -1572699.96 (J) H = -1235482.18 (J) S = 249.21 (J/K) V = 35.30 (cc) Cp = 128.33 (J/K)

Oxygen delta moles = 0.000439292 delta grams = 0.0140568
G = -135.68 (J) H = 15.48 (J) S = 0.11 (J/K) V = 49.42 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1070.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.22 COH = 1.99 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 44.75 (gm) density = 2.55 (gm/cc) viscosity = 3.55 (log 10 poise) (analysis in wt %)
G = -717157.15 (J) H = -553851.34 (J) S = 121.58 (J/K) V = 17.58 (cc) Cp = 62.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.17 | 1.35 | 18.49 | 1.41 | 0.00 | 6.45 | 0.41 | 1.45 | 0.00 | 0.00 | 5.26 | 4.32 | 1.91 | 0.54 | 2.26 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 27.36 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.74Fe"0.33Mg0.65Fe'"0.10Ti0.05Al0.35Si1.75O6
G = -413035.05 (J) H = -330976.42 (J) S = 61.09 (J/K) V = 8.14 (cc) Cp = 31.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.74 | 21.56 | 32.52 | 15.17 | -5.58 | 15.23 | 4.35 |

clinopyroxene mass = 11.11 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.22Fe"0.64Mg0.95Fe'"0.06Ti0.01Al0.25Si1.84O6
G = -160422.18 (J) H = -126524.41 (J) S = 25.24 (J/K) V = 3.26 (cc) Cp = 12.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.58 | 75.98 | 64.12 | 9.71 | -7.65 | 13.84 | 1.57 |

feldspar mass = 16.36 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.42Ca0.57Al1.57Si2.43O8
G = -276041.54 (J) H = -224060.52 (J) S = 38.70 (J/K) V = 6.16 (cc) Cp = 19.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.71 | 57.07 | 1.22 |

spinel mass = 0.44 (gm) density = 4.68 (gm/cc) (analysis in mole %)
Fe"1.15Mg0.20Fe'"0.99Al0.32Cr0.00Ti0.34O4
G = -3690.06 (J) H = -2469.13 (J) S = 0.91 (J/K) V = 0.09 (cc) Cp = 0.41 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.61 | 49.67 | 19.58 | 34.37 |

Total solids mass = 55.27 (gm) density = 3.13 (gm/cc)
G = -853188.83 (J) H = -684030.49 (J) S = 125.94 (J/K) V = 17.65 (cc) Cp = 64.63 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.84 (gm/cc)
G = -1570345.98 (J) H = -1237881.83 (J) S = 247.53 (J/K) V = 35.23 (cc) Cp = 127.49 (J/K)

Oxygen delta moles = 0.000678014 delta grams = 0.0216956
G = -207.69 (J) H = 23.65 (J) S = 0.17 (J/K) V = 75.72 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1060.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.21 COH = 1.97 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 42.00 (gm) density = 2.53 (gm/cc) viscosity = 3.63 (log 10 poise) (analysis in wt %)
G = -674570.82 (J) H = -522432.69 (J) S = 114.12 (J/K) V = 16.59 (cc) Cp = 58.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.73 | 1.28 | 18.44 | 1.33 | 0.00 | 6.00 | 0.43 | 1.34 | 0.00 | 0.00 | 5.11 | 4.33 | 2.02 | 0.58 | 2.40 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 27.24 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.75Fe"0.33Mg0.64Fe'"0.10Ti0.05Al0.35Si1.75O6
G = -410594.59 (J) H = -329855.72 (J) S = 60.56 (J/K) V = 8.10 (cc) Cp = 31.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.35 | 20.91 | 32.52 | 15.25 | -5.36 | 14.88 | 4.45 |

clinopyroxene mass = 11.82 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.22Fe"0.65Mg0.95Fe'"0.06Ti0.01Al0.25Si1.84O6
G = -169958.72 (J) H = -134339.07 (J) S = 26.72 (J/K) V = 3.46 (cc) Cp = 13.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.85 | 76.53 | 65.21 | 9.54 | -7.55 | 13.56 | 1.56 |

feldspar mass = 18.16 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.43Ca0.56Al1.56Si2.44O8
G = -306048.10 (J) H = -248941.47 (J) S = 42.84 (J/K) V = 6.84 (cc) Cp = 22.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 42.71 | 55.99 | 1.30 |

spinel mass = 0.81 (gm) density = 4.69 (gm/cc) (analysis in mole %)
Fe"1.16Mg0.19Fe'"1.00Al0.31Cr0.00Ti0.35O4
G = -6805.68 (J) H = -4563.37 (J) S = 1.68 (J/K) V = 0.17 (cc) Cp = 0.75 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.63 | 49.81 | 18.94 | 34.87 |

Total solids mass = 58.03 (gm) density = 3.12 (gm/cc)
G = -893407.09 (J) H = -717699.63 (J) S = 131.80 (J/K) V = 18.58 (cc) Cp = 67.77 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.03 (gm) density = 2.84 (gm/cc)
G = -1567977.91 (J) H = -1240132.32 (J) S = 245.92 (J/K) V = 35.17 (cc) Cp = 126.73 (J/K)

Oxygen delta moles = 0.000860724 delta grams = 0.0275421
G = -261.47 (J) H = 29.72 (J) S = 0.22 (J/K) V = 95.40 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 1050.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.20 COH = 1.95 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 39.53 (gm) density = 2.52 (gm/cc) viscosity = 3.70 (log 10 poise) (analysis in wt %)
G = -636284.45 (J) H = -494134.66 (J) S = 107.43 (J/K) V = 15.70 (cc) Cp = 55.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.24 | 1.23 | 18.39 | 1.26 | 0.00 | 5.59 | 0.46 | 1.24 | 0.00 | 0.00 | 4.96 | 4.34 | 2.13 | 0.61 | 2.55 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 27.12 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.75Fe"0.32Mg0.64Fe'"0.09Ti0.05Al0.34Si1.75O6
G = -408158.25 (J) H = -328731.65 (J) S = 60.03 (J/K) V = 8.06 (cc) Cp = 30.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.95 | 20.27 | 32.49 | 15.36 | -5.15 | 14.55 | 4.54 |

clinopyroxene mass = 12.45 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.66Mg0.95Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -178539.90 (J) H = -141432.52 (J) S = 28.04 (J/K) V = 3.65 (cc) Cp = 14.48 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.10 | 77.08 | 66.27 | 9.38 | -7.46 | 13.29 | 1.54 |

feldspar mass = 19.81 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.01Na0.44Ca0.55Al1.55Si2.45O8
G = -333337.93 (J) H = -271715.39 (J) S = 46.57 (J/K) V = 7.46 (cc) Cp = 24.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 43.63 | 55.00 | 1.38 |

spinel mass = 1.11 (gm) density = 4.70 (gm/cc) (analysis in mole %)
Fe"1.17Mg0.18Fe'"1.00Al0.29Cr0.00Ti0.35O4
G = -9272.87 (J) H = -6231.83 (J) S = 2.30 (J/K) V = 0.24 (cc) Cp = 1.03 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.60 | 49.96 | 18.34 | 35.29 |

Total solids mass = 60.50 (gm) density = 3.12 (gm/cc)
G = -929308.96 (J) H = -748111.40 (J) S = 136.94 (J/K) V = 19.41 (cc) Cp = 70.57 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.03 (gm) density = 2.85 (gm/cc)
G = -1565593.41 (J) H = -1242246.05 (J) S = 244.38 (J/K) V = 35.11 (cc) Cp = 126.06 (J/K)

Oxygen delta moles = 0.000984343 delta grams = 0.0314978
G = -296.52 (J) H = 33.63 (J) S = 0.25 (J/K) V = 108.29 (cc) Cp = 0.04 (J/K)

**********_____**********
Title: mafic

T = 1040.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.20  COH = 1.93  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 37.29 (gm)  density = 2.50 (gm/cc)  viscosity = 3.76 (log 10 poise)  (analysis in wt %)
G = -601341.21 (J)  H = -468246.06 (J)  S = 101.36 (J/K)  V = 14.89 (cc)  Cp = 52.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.71 | 1.17 | 18.36 | 1.19 | 0.00 | 5.21 | 0.49 | 1.16 | 0.00 | 0.00 | 4.81 | 4.33 | 2.24 | 0.63 | 2.71 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 26.99 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.32Mg0.63Fe'"0.09Ti0.05Al0.34Si1.75O6
G = -405685.16 (J)  H = -327570.38 (J)  S = 59.49 (J/K)  V = 8.02 (cc)  Cp = 30.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.53 | 19.63 | 32.43 | 15.51 | -4.95 | 14.23 | 4.62 |

clinopyroxene  mass = 13.05 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.67Mg0.95Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -186461.45 (J)  H = -148034.23 (J)  S = 29.26 (J/K)  V = 3.82 (cc)  Cp = 15.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.35 | 77.61 | 67.31 | 9.24 | -7.38 | 13.04 | 1.53 |

feldspar  mass = 21.33 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.01Na0.44Ca0.54Al1.54Si2.46O8
G = -358286.23 (J)  H = -292675.05 (J)  S = 49.96 (J/K)  V = 8.04 (cc)  Cp = 25.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 44.47 | 54.08 | 1.45 |

spinel  mass = 1.35 (gm)  density = 4.70 (gm/cc)  (analysis in mole %)
Fe"1.18Mg0.18Fe'"1.00Al0.28Cr0.00Ti0.36O4
G = -11206.84 (J)  H = -7549.86 (J)  S = 2.78 (J/K)  V = 0.29 (cc)  Cp = 1.25 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.55 | 50.11 | 17.78 | 35.66 |

apatite  mass = 0.01 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -216.19 (J)  H = -173.53 (J)  S = 0.03 (J/K)  V = 0.00 (cc)  Cp = 0.02 (J/K)

Total solids  mass = 62.74 (gm)  density = 3.11 (gm/cc)
G = -961855.88 (J)  H = -776003.05 (J)  S = 141.53 (J/K)  V = 20.17 (cc)  Cp = 73.11 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.03 (gm)  density = 2.85 (gm/cc)
G = -1563197.10 (J)  H = -1244249.12 (J)  S = 242.89 (J/K)  V = 35.05 (cc)  Cp = 125.43 (J/K)

Oxygen  delta moles = 0.00105833  delta grams = 0.0338654
G = -316.13 (J)  H = 35.77 (J)  S = 0.27 (J/K)  V = 115.55 (cc)  Cp = 0.04 (J/K)

**********----------**********
Title: mafic

T = 1030.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.19  COH = 1.91  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 35.23 (gm)  density = 2.49 (gm/cc)  viscosity = 3.83 (log 10 poise)  (analysis in wt %)
G = -568949.13 (J)  H = -444173.45 (J)  S = 95.75 (J/K)  V = 14.13 (cc)  Cp = 49.39 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.19 | 1.12 | 18.34 | 1.12 | 0.00 | 4.86 | 0.52 | 1.08 | 0.00 | 0.00 | 4.63 | 4.32 | 2.35 | 0.62 | 2.86 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 26.86 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.32Mg0.63Fe'"0.09Ti0.05Al0.34Si1.75O6
G = -403114.92 (J)  H = -326322.09 (J)  S = 58.93 (J/K)  V = 7.97 (cc)  Cp = 30.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.09 | 18.98 | 32.36 | 15.70 | -4.75 | 13.91 | 4.71 |

clinopyroxene  mass = 13.63 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.68Mg0.95Fe'"0.05Ti0.01Al0.23Si1.85O6
G = -193974.83 (J)  H = -154340.38 (J)  S = 30.41 (J/K)  V = 3.98 (cc)  Cp = 15.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.60 | 78.14 | 68.35 | 9.11 | -7.32 | 12.80 | 1.51 |

feldspar  mass = 22.72 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.45Ca0.53Al1.53Si2.47O8
G = -381203.51 (J)  H = -312064.07 (J)  S = 53.06 (J/K)  V = 8.57 (cc)  Cp = 27.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.24 | 53.23 | 1.53 |

spinel  mass = 1.54 (gm)  density = 4.71 (gm/cc)  (analysis in mole %)
Fe"1.19Mg0.17Fe'"1.01Al0.27Cr0.00Ti0.36O4
G = -12688.35 (J)  H = -8569.75 (J)  S = 3.16 (J/K)  V = 0.33 (cc)  Cp = 1.43 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.48 | 50.26 | 17.23 | 35.99 |

apatite  mass = 0.06 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -861.18 (J)  H = -692.94 (J)  S = 0.13 (J/K)  V = 0.02 (cc)  Cp = 0.07 (J/K)

Total solids  mass = 64.81 (gm)  density = 3.11 (gm/cc)
G = -991842.79 (J)  H = -801989.23 (J)  S = 145.69 (J/K)  V = 20.87 (cc)  Cp = 75.61 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.03 (gm)  density = 2.86 (gm/cc)
G = -1560791.92 (J)  H = -1246162.68 (J)  S = 241.44 (J/K)  V = 35.00 (cc)  Cp = 125.00 (J/K)

Oxygen  delta moles = 0.00108881  delta grams = 0.0348406
G = -322.48 (J)  H = 36.41 (J)  S = 0.28 (J/K)  V = 117.97 (cc)  Cp = 0.04 (J/K)

**********_____**********
Title: mafic

T = 1020.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.92  delta HM = -4.96  NNO = 0.00  QFM = 0.18  COH = 1.89  IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid  mass = 33.35 (gm)  density = 2.48 (gm/cc)  viscosity = 3.89 (log 10 poise)  (analysis in wt %)
G = -539509.35 (J)  H = -422259.66 (J)  S = 90.67 (J/K)  V = 13.44 (cc)  Cp = 46.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.62 | 1.07 | 18.33 | 1.05 | 0.00 | 4.54 | 0.54 | 1.00 | 0.00 | 0.00 | 4.46 | 4.29 | 2.46 | 0.61 | 3.02 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 26.73 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.32Mg0.62Fe'"0.09Ti0.06Al0.34Si1.75O6
G = -400669.73 (J)  H = -325165.77 (J)  S = 58.39 (J/K)  V = 7.93 (cc)  Cp = 30.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.62 | 18.34 | 32.28 | 15.93 | -4.56 | 13.60 | 4.79 |

clinopyroxene  mass = 14.16 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.20Fe"0.69Mg0.94Fe'"0.05Ti0.01Al0.23Si1.86O6
G = -200933.74 (J)  H = -160232.36 (J)  S = 31.47 (J/K)  V = 4.13 (cc)  Cp = 16.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.84 | 78.66 | 69.37 | 8.99 | -7.26 | 12.58 | 1.49 |

feldspar  mass = 24.00 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.46Ca0.52Al1.52Si2.48O8
G = -402075.15 (J)  H = -329859.17 (J)  S = 55.85 (J/K)  V = 9.05 (cc)  Cp = 29.29 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.96 | 52.43 | 1.61 |

spinel  mass = 1.69 (gm)  density = 4.72 (gm/cc)  (analysis in mole %)
Fe"1.20Mg0.17Fe'"1.01Al0.27Cr0.00Ti0.36O4
G = -13783.57 (J)  H = -9334.16 (J)  S = 3.44 (J/K)  V = 0.36 (cc)  Cp = 1.56 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.38 | 50.43 | 16.70 | 36.25 |

apatite  mass = 0.09 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1411.71 (J)  H = -1138.70 (J)  S = 0.21 (J/K)  V = 0.03 (cc)  Cp = 0.11 (J/K)

Total solids  mass = 66.68 (gm)  density = 3.10 (gm/cc)
G = -1018873.89 (J)  H = -825730.16 (J)  S = 149.36 (J/K)  V = 21.50 (cc)  Cp = 77.73 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.03 (gm)  density = 2.86 (gm/cc)
G = -1558383.24 (J)  H = -1247989.81 (J)  S = 240.03 (J/K)  V = 34.95 (cc)  Cp = 124.47 (J/K)

Oxygen  delta moles = 0.00108635  delta grams = 0.034762
G = -319.00 (J)  H = 35.94 (J)  S = 0.27 (J/K)  V = 116.80 (cc)  Cp = 0.04 (J/K)

**********----------**********
Title: mafic

T = 1010.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.18  COH = 1.86
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 31.65 (gm)  density = 2.47 (gm/cc)  viscosity = 3.94 (log 10 poise)  (analysis in wt %)
G = -512618.74 (J)  H = -402211.02 (J)  S = 86.04 (J/K)  V = 12.81 (cc)  Cp = 44.33 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.01 | 1.02 | 18.32 | 0.99 | 0.00 | 4.24 | 0.57 | 0.94 | 0.00 | 0.00 | 4.30 | 4.26 | 2.57 | 0.60 | 3.18 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 26.62 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.32Mg0.61Fe'"0.09Ti0.06Al0.34Si1.75O6
G = -398340.22 (J)  H = -324093.99 (J)  S = 57.86 (J/K)  V = 7.89 (cc)  Cp = 30.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.12 | 17.71 | 32.18 | 16.19 | -4.37 | 13.30 | 4.87 |

clinopyroxene  mass = 14.67 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
cpx Na0.01Ca0.19Fe"0.70Mg0.94Fe'"0.05Ti0.01Al0.23Si1.86O6
G = -207470.29 (J)  H = -165812.54 (J)  S = 32.47 (J/K)  V = 4.28 (cc)  Cp = 16.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.08 | 79.16 | 70.39 | 8.88 | -7.21 | 12.37 | 1.48 |

feldspar  mass = 25.17 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.47Ca0.52Al1.52Si2.48O8
G = -421114.27 (J)  H = -346224.75 (J)  S = 58.36 (J/K)  V = 9.50 (cc)  Cp = 30.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 46.61 | 51.70 | 1.69 |

spinel  mass = 1.79 (gm)  density = 4.73 (gm/cc)  (analysis in mole %)
Fe"1.20Mg0.16Fe'"1.01Al0.26Cr0.00Ti0.36O4
G = -14545.87 (J)  H = -9877.26 (J)  S = 3.64 (J/K)  V = 0.38 (cc)  Cp = 1.65 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -3.26 | 50.63 | 16.19 | 36.45 |

apatite  mass = 0.13 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1883.92 (J)  H = -1523.31 (J)  S = 0.28 (J/K)  V = 0.04 (cc)  Cp = 0.14 (J/K)

Total solids  mass = 68.38 (gm)  density = 3.10 (gm/cc)
G = -1043354.57 (J)  H = -847531.86 (J)  S = 152.61 (J/K)  V = 22.08 (cc)  Cp = 79.65 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.03 (gm)  density = 2.87 (gm/cc)
G = -1555973.32 (J)  H = -1249742.88 (J)  S = 238.66 (J/K)  V = 34.90 (cc)  Cp = 123.98 (J/K)

Oxygen  delta moles = 0.00105577  delta grams = 0.0337835
G = -307.36 (J)  H = 34.55 (J)  S = 0.27 (J/K)  V = 112.64 (cc)  Cp = 0.04 (J/K)

**********_____**********
Title: mafic

T = 1000.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = 0.17  COH = 1.84
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 30.26 (gm)  density = 2.46 (gm/cc)  viscosity = 4.01 (log 10 poise)  (analysis in wt %)
G = -490212.86 (J)  H = -385596.42 (J)  S = 82.17 (J/K)  V = 12.29 (cc)  Cp = 42.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.50 | 0.93 | 18.18 | 0.96 | 0.00 | 4.05 | 0.60 | 0.85 | 0.00 | 0.00 | 4.18 | 4.15 | 2.67 | 0.59 | 3.33 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.36 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.74Mg1.10Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -160458.01 (J)  H = -128710.42 (J)  S = 24.94 (J/K)  V = 3.29 (cc)  Cp = 13.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -78.60 | 94.16 | 73.80 | 6.95 | -6.26 | 9.59 | 0.35 |

clinopyroxene  mass = 29.19 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.77Fe"0.33Mg0.61Fe'"0.09Ti0.05Al0.34Si1.76O6
G = -435242.34 (J)  H = -354823.07 (J)  S = 63.17 (J/K)  V = 8.65 (cc)  Cp = 33.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.79 | 17.74 | 33.29 | 15.40 | -4.50 | 13.36 | 4.91 |

feldspar  mass = 26.75 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.47Ca0.51Al1.51Si2.49O8
G = -446849.63 (J)  H = -368191.75 (J)  S = 61.78 (J/K)  V = 10.09 (cc)  Cp = 32.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 47.00 | 51.25 | 1.76 |

spinel  mass = 2.34 (gm)  density = 4.74 (gm/cc)  (analysis in mole %)
Fe"1.20Mg0.15Fe'"1.04Al0.25Cr0.00Ti0.35O4
G = -18798.74 (J)  H = -12776.45 (J)  S = 4.73 (J/K)  V = 0.49 (cc)  Cp = 2.15 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -2.40 | 52.06 | 15.01 | 35.33 |

apatite  mass = 0.15 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2275.30 (J)  H = -1844.27 (J)  S = 0.34 (J/K)  V = 0.05 (cc)  Cp = 0.17 (J/K)

Total solids  mass = 69.79 (gm)  density = 3.09 (gm/cc)
G = -1063624.03 (J)  H = -866345.96 (J)  S = 154.95 (J/K)  V = 22.57 (cc)  Cp = 81.34 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.05 (gm)  density = 2.87 (gm/cc)
G = -1553836.89 (J)  H = -1251942.38 (J)  S = 237.12 (J/K)  V = 34.87 (cc)  Cp = 123.66 (J/K)

Oxygen  delta moles = 0.00150653  delta grams = 0.048207
G = -434.78 (J)  H = 48.76 (J)  S = 0.38 (J/K)  V = 159.47 (cc)  Cp = 0.05 (J/K)

**********----------**********
Title: mafic

T = 990.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.16  COH = 1.82  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 28.80 (gm)  density = 2.45 (gm/cc)  viscosity = 4.05 (log 10 poise)  (analysis in wt %)
G = -466943.01 (J)  H = -368162.44 (J)  S = 78.20 (J/K)  V = 11.74 (cc)  Cp = 40.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.82 | 0.89 | 18.16 | 0.91 | 0.00 | 3.79 | 0.63 | 0.79 | 0.00 | 0.00 | 4.05 | 4.11 | 2.78 | 0.58 | 3.49 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.01 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.75Mg1.09Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -168990.92 (J)  H = -135843.77 (J)  S = 26.24 (J/K)  V = 3.48 (cc)  Cp = 14.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.88 | 94.30 | 75.03 | 6.94 | -6.28 | 9.54 | 0.35 |

clinopyroxene  mass = 28.94 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.78Fe"0.33Mg0.60Fe'"0.09Ti0.06Al0.34Si1.75O6
G = -430979.89 (J)  H = -352241.74 (J)  S = 62.33 (J/K)  V = 8.57 (cc)  Cp = 32.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.44 | 16.85 | 33.12 | 15.78 | -4.28 | 13.09 | 4.99 |

feldspar  mass = 27.76 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.48Ca0.51Al1.51Si2.49O8
G = -463115.25 (J)  H = -382423.21 (J)  S = 63.88 (J/K)  V = 10.48 (cc)  Cp = 33.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 47.52 | 50.65 | 1.84 |

spinel  mass = 2.35 (gm)  density = 4.75 (gm/cc)  (analysis in mole %)
Fe"1.21Mg0.14Fe'"1.05Al0.24Cr0.00Ti0.35O4
G = -18754.36 (J)  H = -12780.37 (J)  S = 4.73 (J/K)  V = 0.50 (cc)  Cp = 2.16 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -2.21 | 52.37 | 14.46 | 35.39 |

apatite  mass = 0.18 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2638.75 (J)  H = -2144.08 (J)  S = 0.39 (J/K)  V = 0.06 (cc)  Cp = 0.20 (J/K)

Total solids  mass = 71.25 (gm)  density = 3.09 (gm/cc)
G = -1084479.17 (J)  H = -885433.17 (J)  S = 157.58 (J/K)  V = 23.07 (cc)  Cp = 82.98 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.05 (gm)  density = 2.87 (gm/cc)
G = -1551422.18 (J)  H = -1253595.61 (J)  S = 235.78 (J/K)  V = 34.82 (cc)  Cp = 123.25 (J/K)

Oxygen  delta moles = 0.0014132  delta grams = 0.0452209
G = -404.29 (J)  H = 45.23 (J)  S = 0.36 (J/K)  V = 148.42 (cc)  Cp = 0.05 (J/K)

**********_____**********
Title: mafic

T = 980.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.15  COH = 1.80  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 27.45 (gm)  density = 2.44 (gm/cc)  viscosity = 4.08 (log 10 poise)  (analysis in wt %)
G = -445401.68 (J)  H = -351993.66 (J)  S = 74.54 (J/K)  V = 11.23 (cc)  Cp = 38.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.09 | 0.85 | 18.15 | 0.86 | 0.00 | 3.56 | 0.66 | 0.73 | 0.00 | 0.00 | 3.92 | 4.06 | 2.89 | 0.58 | 3.66 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.65 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.76Mg1.08Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -177161.03 (J)  H = -142714.08 (J)  S = 27.49 (J/K)  V = 3.65 (cc)  Cp = 14.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.19 | 94.44 | 76.27 | 6.95 | -6.31 | 9.50 | 0.34 |

clinopyroxene  mass = 28.73 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.79Fe"0.33Mg0.59Fe'"0.09Ti0.06Al0.34Si1.75O6
G = -427148.80 (J)  H = -349991.85 (J)  S = 61.57 (J/K)  V = 8.50 (cc)  Cp = 32.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.99 | 16.00 | 32.97 | 16.20 | -4.06 | 12.83 | 5.08 |

feldspar  mass = 28.69 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.48Ca0.50Al1.50Si2.50O8
G = -477897.17 (J)  H = -395487.31 (J)  S = 65.76 (J/K)  V = 10.83 (cc)  Cp = 34.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.01 | 50.08 | 1.92 |

spinel  mass = 2.33 (gm)  density = 4.76 (gm/cc)  (analysis in mole %)
Fe"1.21Mg0.14Fe'"1.05Al0.24Cr0.00Ti0.35O4
G = -18445.40 (J)  H = -12604.08 (J)  S = 4.66 (J/K)  V = 0.49 (cc)  Cp = 2.13 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -2.01 | 52.70 | 13.93 | 35.38 |

apatite  mass = 0.20 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2953.19 (J)  H = -2405.40 (J)  S = 0.44 (J/K)  V = 0.06 (cc)  Cp = 0.23 (J/K)

Total solids  mass = 72.59 (gm)  density = 3.08 (gm/cc)
G = -1103605.58 (J)  H = -903202.72 (J)  S = 159.92 (J/K)  V = 23.53 (cc)  Cp = 84.49 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.04 (gm)  density = 2.88 (gm/cc)
G = -1549007.26 (J)  H = -1255196.38 (J)  S = 234.46 (J/K)  V = 34.77 (cc)  Cp = 122.86 (J/K)

Oxygen  delta moles = 0.00129452  delta grams = 0.0414232
G = -367.08 (J)  H = 40.97 (J)  S = 0.33 (J/K)  V = 134.88 (cc)  Cp = 0.05 (J/K)

**********----------**********
Title: mafic

T = 970.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.69  delta HM = -4.99  NNO = 0.00  QFM = 0.15  COH = 1.77  IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid  mass = 26.19 (gm)  density = 2.43 (gm/cc)  viscosity = 4.11 (log 10 poise)  (analysis in wt %)
G = -425192.52 (J)  H = -336776.78 (J)  S = 71.12 (J/K)  V = 10.76 (cc)  Cp = 36.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.33 | 0.80 | 18.13 | 0.81 | 0.00 | 3.34 | 0.69 | 0.68 | 0.00 | 0.00 | 3.80 | 4.01 | 3.00 | 0.57 | 3.84 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 13.30 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.78Mg1.07Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -185500.96 (J)  H = -149741.40 (J)  S = 28.77 (J/K)  V = 3.84 (cc)  Cp = 15.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.67 | 94.59 | 77.64 | 6.96 | -6.35 | 9.49 | 0.34 |

clinopyroxene  mass = 28.33 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.33Mg0.58Fe'"0.09Ti0.06Al0.34Si1.75O6
G = -420502.02 (J)  H = -345388.14 (J)  S = 60.42 (J/K)  V = 8.37 (cc)  Cp = 31.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.39 | 15.32 | 32.97 | 16.44 | -3.92 | 12.63 | 5.16 |

clinopyroxene  mass = 0.25 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.91Fe"0.25Mg0.38Fe'"0.09Ti0.34Al0.70Si1.28O6
G = -3646.06 (J)  H = -3010.72 (J)  S = 0.51 (J/K)  V = 0.07 (cc)  Cp = 0.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.95 | 4.66 | 24.57 | 62.38 | 5.45 | 3.91 | 3.98 |

feldspar  mass = 29.52 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.48Ca0.50Al1.50Si2.50O8
G = -490920.51 (J)  H = -407146.97 (J)  S = 67.39 (J/K)  V = 11.14 (cc)  Cp = 35.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.48 | 49.52 | 2.00 |

spinel  mass = 2.24 (gm)  density = 4.77 (gm/cc)  (analysis in mole %)
Fe"1.22Mg0.13Fe'"1.07Al0.23Cr0.00Ti0.35O4
G = -17583.16 (J)  H = -12045.60 (J)  S = 4.45 (J/K)  V = 0.47 (cc)  Cp = 2.04 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -1.71 | 53.29 | 13.35 | 35.07 |

apatite  mass = 0.22 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3231.04 (J)  H = -2638.10 (J)  S = 0.48 (J/K)  V = 0.07 (cc)  Cp = 0.25 (J/K)

Total solids  mass = 73.85 (gm)  density = 3.08 (gm/cc)
G = -1121383.75 (J)  H = -919970.93 (J)  S = 162.02 (J/K)  V = 23.96 (cc)  Cp = 85.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.04 (gm) density = 2.88 (gm/cc)
G = -1546576.27 (J) H = -1256747.71 (J) S = 233.14 (J/K) V = 34.71 (cc) Cp = 122.50 (J/K)

Oxygen delta moles = 0.00112112 delta grams = 0.0358744
G = -315.09 (J) H = 35.08 (J) S = 0.28 (J/K) V = 115.88 (cc) Cp = 0.04 (J/K)

**********----------**********
Title: mafic

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 24.99 (gm) density = 2.43 (gm/cc) viscosity = 4.13 (log 10 poise) (analysis in wt %)
G = -405868.97 (J) H = -322153.33 (J) S = 67.89 (J/K) V = 10.30 (cc) Cp = 34.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.52 | 0.73 | 18.10 | 0.78 | 0.00 | 3.16 | 0.73 | 0.63 | 0.00 | 0.00 | 3.68 | 3.98 | 3.11 | 0.57 | 4.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.03 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.79Mg1.05Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -194586.03 (J) H = -157380.62 (J) S = 30.17 (J/K) V = 4.04 (cc) Cp = 16.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.46 | 94.74 | 79.31 | 6.97 | -6.41 | 9.51 | 0.33 |

clinopyroxene mass = 27.47 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.33Mg0.58Fe'"0.09Ti0.06Al0.34Si1.75O6
G = -406866.59 (J) H = -334953.53 (J) S = 58.32 (J/K) V = 8.11 (cc) Cp = 30.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.64 | 15.00 | 33.34 | 16.14 | -3.96 | 12.60 | 5.25 |

clinopyroxene mass = 1.06 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.92Fe"0.25Mg0.38Fe'"0.09Ti0.34Al0.71Si1.28O6
G = -15688.59 (J) H = -12984.97 (J) S = 2.19 (J/K) V = 0.30 (cc) Cp = 1.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.53 | 4.44 | 24.86 | 63.01 | 5.48 | 3.73 | 4.00 |

feldspar mass = 30.21 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.49Ca0.49Al1.49Si2.51O8
G = -501793.23 (J) H = -417065.26 (J) S = 68.71 (J/K) V = 11.40 (cc) Cp = 36.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.96 | 48.95 | 2.09 |

spinel mass = 2.03 (gm) density = 4.78 (gm/cc) (analysis in mole %)
Fe"1.21Mg0.13Fe'"1.09Al0.23Cr0.00Ti0.34O4
G = -15818.68 (J) H = -10859.73 (J) S = 4.02 (J/K) V = 0.42 (cc) Cp = 1.85 (J/K)

| chromite | hercynite | magnetite | spinel | ulvospinel |
|---|---|---|---|---|
| 0.00 | -1.20 | 54.39 | 12.66 | 34.14 |

apatite mass = 0.23 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3483.93 (J) H = -2851.45 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.27 (J/K)

Total solids mass = 75.03 (gm) density = 3.08 (gm/cc)
G = -1138237.05 (J) H = -936095.57 (J) S = 163.92 (J/K) V = 24.36 (cc) Cp = 87.22 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.03 (gm) density = 2.89 (gm/cc)
G = -1544106.02 (J) H = -1258248.90 (J) S = 231.81 (J/K) V = 34.66 (cc) Cp = 122.15 (J/K)

Oxygen delta moles = 0.000849339 delta grams = 0.0271778
G = -236.57 (J) H = 26.27 (J) S = 0.21 (J/K) V = 87.08 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 950.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.13 COH = 1.72 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 23.87 (gm) density = 2.42 (gm/cc) viscosity = 4.14 (log 10 poise) (analysis in wt %)
G = -387709.14 (J) H = -308379.09 (J) S = 64.86 (J/K) V = 9.87 (cc) Cp = 33.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.67 | 0.67 | 18.07 | 0.74 | 0.00 | 3.00 | 0.76 | 0.58 | 0.00 | 0.00 | 3.57 | 3.94 | 3.23 | 0.57 | 4.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.74 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.81Mg1.04Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -203341.85 (J) H = -164784.00 (J) S = 31.52 (J/K) V = 4.23 (cc) Cp = 17.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.26 | 94.90 | 80.97 | 7.00 | -6.48 | 9.55 | 0.32 |

clinopyroxene mass = 26.68 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.34Mg0.57Fe'"0.09Ti0.06Al0.34Si1.76O6
G = -394391.41 (J) H = -325426.97 (J) S = 56.38 (J/K) V = 7.88 (cc) Cp = 29.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.88 | 14.68 | 33.70 | 15.85 | -4.01 | 12.57 | 5.33 |

clinopyroxene mass = 1.81 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.92Fe"0.25Mg0.37Fe'"0.09Ti0.35Al0.71Si1.27O6
G = -26833.26 (J) H = -22260.78 (J) S = 3.74 (J/K) V = 0.51 (cc) Cp = 2.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.12 | 4.22 | 25.15 | 63.65 | 5.50 | 3.56 | 4.02 |

feldspar mass = 30.85 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.49Ca0.48Al1.48Si2.52O8
G = -511688.41 (J) H = -426209.99 (J) S = 69.88 (J/K) V = 11.65 (cc) Cp = 37.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.41 | 48.40 | 2.19 |

spinel mass = 1.81 (gm) density = 4.79 (gm/cc) (analysis in mole %)
Fe"1.21Mg0.12Fe'"1.11Al0.23Cr0.00Ti0.33O4
G = -13970.62 (J) H = -9612.10 (J) S = 3.56 (J/K) V = 0.38 (cc) Cp = 1.64 (J/K)

chromite hercynite magnetite spinel ulvospinel
0.00 -0.71 55.52 12.02 33.17

apatite mass = 0.25 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3702.16 (J) H = -3037.37 (J) S = 0.54 (J/K) V = 0.08 (cc) Cp = 0.28 (J/K)

Total solids mass = 76.15 (gm) density = 3.08 (gm/cc)
G = -1153927.71 (J) H = -951331.20 (J) S = 165.64 (J/K) V = 24.73 (cc) Cp = 88.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.02 (gm) density = 2.89 (gm/cc)
G = -1541636.85 (J) H = -1259710.29 (J) S = 230.49 (J/K) V = 34.60 (cc) Cp = 121.82 (J/K)

Oxygen delta moles = 0.000554441 delta grams = 0.0177415
G = -153.04 (J) H = 16.95 (J) S = 0.14 (J/K) V = 56.38 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 940.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.12 COH = 1.70 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 22.96 (gm) density = 2.41 (gm/cc) viscosity = 4.17 (log 10 poise) (analysis in wt %)
G = -372798.48 (J) H = -297137.05 (J) S = 62.37 (J/K) V = 9.52 (cc) Cp = 32.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.97 | 0.62 | 17.87 | 0.71 | 0.00 | 2.83 | 0.79 | 0.53 | 0.00 | 0.00 | 3.44 | 3.97 | 3.33 | 0.57 | 4.38 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.73 (gm) density = 3.87 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.31)3Al2Si3O12
G = -24386.98 (J) H = -20068.00 (J) S = 3.56 (J/K) V = 0.45 (cc) Cp = 1.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.36 | 17.39 | 31.25 |

orthopyroxene mass = 14.57 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.83Mg1.02Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -199841.22 (J) H = -162260.13 (J) S = 30.98 (J/K) V = 4.17 (cc) Cp = 16.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.00 | 95.04 | 82.71 | 6.91 | -6.43 | 9.45 | 0.32 |

clinopyroxene mass = 26.04 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.80Fe"0.34Mg0.57Fe'"0.08Ti0.06Al0.33Si1.76O6
G = -383970.26 (J) H = -317543.86 (J) S = 54.76 (J/K) V = 7.68 (cc) Cp = 29.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.15 | 14.32 | 34.11 | 15.45 | -3.85 | 12.32 | 5.48 |

clinopyroxene mass = 2.72 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.92Fe"0.26Mg0.36Fe'"0.09Ti0.35Al0.71Si1.27O6
G = -40142.89 (J) H = -33377.84 (J) S = 5.58 (J/K) V = 0.77 (cc) Cp = 2.99 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-6.64 4.02 25.51 64.06 5.66 3.27 4.12

feldspar mass = 30.44 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.51Ca0.47Al1.47Si2.53O8
G = -504134.81 (J) H = -420771.44 (J) S = 68.72 (J/K) V = 11.50 (cc) Cp = 36.89 (J/K)
albite anorthite sanidine
50.71 46.95 2.35

spinel mass = 1.28 (gm) density = 4.80 (gm/cc) (analysis in mole %)
Fe"1.21Mg0.11Fe'''1.13Al0.22Cr0.00Ti0.33O4
G = -9806.10 (J) H = -6760.91 (J) S = 2.51 (J/K) V = 0.27 (cc) Cp = 1.16 (J/K)
chromite hercynite magnetite spinel ulvospinel
0.00 -0.49 56.37 11.39 32.73

apatite mass = 0.26 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3878.74 (J) H = -3189.89 (J) S = 0.57 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 77.04 (gm) density = 3.09 (gm/cc)
G = -1166161.00 (J) H = -963972.09 (J) S = 166.66 (J/K) V = 24.93 (cc) Cp = 89.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.00 (gm) density = 2.90 (gm/cc)
G = -1538959.48 (J) H = -1261109.13 (J) S = 229.03 (J/K) V = 34.45 (cc) Cp = 121.42 (J/K)

Oxygen delta moles = -0.000156364 delta grams = -0.00500347
G = 42.77 (J) H = -4.73 (J) S = -0.04 (J/K) V = -15.77 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: mafic

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 22.21 (gm) density = 2.40 (gm/cc) viscosity = 4.20 (log 10 poise) (analysis in wt %)
G = -360469.22 (J) H = -287906.28 (J) S = 60.31 (J/K) V = 9.24 (cc) Cp = 30.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.41 | 0.58 | 17.49 | 0.69 | 0.00 | 2.66 | 0.82 | 0.49 | 0.00 | 0.00 | 3.30 | 4.07 | 3.41 | 0.57 | 4.52 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.91 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.52Mg0.30)3Al2Si3O12
G = -68809.56 (J) H = -56738.91 (J) S = 10.03 (J/K) V = 1.27 (cc) Cp = 5.42 (J/K)
almandine grossular pyrope
52.15 17.43 30.42

orthopyroxene mass = 13.68 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.84Mg1.01Fe'''0.03Ti0.00Al0.16Si1.90O6
G = -186671.57 (J) H = -151859.44 (J) S = 28.93 (J/K) V = 3.91 (cc) Cp = 15.82 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-89.63 95.17 84.48 6.71 -6.27 9.21 0.32

clinopyroxene mass = 25.47 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.80Fe"0.35Mg0.56Fe'"0.08Ti0.06Al0.33Si1.77O6
G = -374732.11 (J) H = -310596.63 (J) S = 53.31 (J/K) V = 7.51 (cc) Cp = 28.53 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
22.48 13.94 34.56 14.96 -3.49 11.85 5.70

clinopyroxene mass = 3.76 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.92Fe"0.26Mg0.36Fe'"0.09Ti0.35Al0.71Si1.27O6
G = -55378.27 (J) H = -46147.43 (J) S = 7.67 (J/K) V = 1.06 (cc) Cp = 4.13 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-7.10 3.84 25.93 64.23 5.95 2.84 4.31

feldspar mass = 29.17 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.53Ca0.45Al1.45Si2.55O8
G = -482273.51 (J) H = -403294.57 (J) S = 65.64 (J/K) V = 11.03 (cc) Cp = 35.34 (J/K)
albite anorthite sanidine
52.80 44.63 2.57

spinel mass = 0.49 (gm) density = 4.81 (gm/cc) (analysis in mole %)
Fe"1.22Mg0.11Fe'"1.14Al0.21Cr0.00Ti0.33O4
G = -3747.97 (J) H = -2589.40 (J) S = 0.96 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)
chromite hercynite magnetite spinel ulvospinel
0.00 -0.52 56.93 10.78 32.80

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4022.97 (J) H = -3316.45 (J) S = 0.59 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 77.75 (gm) density = 3.11 (gm/cc)
G = -1175635.96 (J) H = -974542.84 (J) S = 167.14 (J/K) V = 24.98 (cc) Cp = 89.99 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.92 (gm/cc)
G = -1536105.18 (J) H = -1262449.11 (J) S = 227.45 (J/K) V = 34.22 (cc) Cp = 120.96 (J/K)

Oxygen delta moles = -0.00122919 delta grams = -0.0393326
G = 333.14 (J) H = -36.71 (J) S = -0.31 (J/K) V = -122.96 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: mafic

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 21.48 (gm) density = 2.40 (gm/cc) viscosity = 4.23 (log 10 poise) (analysis in wt %)
G = -348571.52 (J) H = -279010.74 (J) S = 58.30 (J/K) V = 8.97 (cc) Cp = 29.92 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

61.84 0.54 17.17 0.65 0.00 2.47 0.85 0.45 0.00 0.00 3.18 4.12 3.49 0.58 4.68 0.00 0.00 0.00 0.00

garnet mass = 7.30 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -101948.60 (J) H = -84244.46 (J) S = 14.84 (J/K) V = 1.88 (cc) Cp = 8.04 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.74 | 17.48 | 29.79 |

orthopyroxene mass = 12.96 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.00Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -176127.37 (J) H = -143595.54 (J) S = 27.27 (J/K) V = 3.70 (cc) Cp = 14.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.61 | 95.28 | 85.66 | 6.52 | -6.11 | 8.94 | 0.32 |

clinopyroxene mass = 25.04 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.81Fe"0.35Mg0.56Fe'"0.08Ti0.06Al0.32Si1.77O6
G = -367922.19 (J) H = -305684.73 (J) S = 52.16 (J/K) V = 7.39 (cc) Cp = 28.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.22 | 13.55 | 34.71 | 14.51 | -3.21 | 11.36 | 5.87 |

clinopyroxene mass = 4.46 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.92Fe"0.26Mg0.35Fe'"0.09Ti0.35Al0.71Si1.27O6
G = -65621.77 (J) H = -54811.23 (J) S = 9.06 (J/K) V = 1.26 (cc) Cp = 4.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.42 | 3.65 | 26.14 | 64.61 | 6.15 | 2.40 | 4.47 |

feldspar mass = 28.41 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.55Ca0.43Al1.43Si2.57O8
G = -469101.56 (J) H = -393052.28 (J) S = 63.74 (J/K) V = 10.76 (cc) Cp = 34.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 54.50 | 42.72 | 2.78 |

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4138.49 (J) H = -3419.84 (J) S = 0.60 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 78.46 (gm) density = 3.13 (gm/cc)
G = -1184859.98 (J) H = -984808.08 (J) S = 167.67 (J/K) V = 25.08 (cc) Cp = 90.64 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.94 (gm/cc)
G = -1533431.50 (J) H = -1263818.82 (J) S = 225.97 (J/K) V = 34.04 (cc) Cp = 120.56 (J/K)

Oxygen delta moles = -0.00199322 delta grams = -0.0637808
G = 535.23 (J) H = -58.81 (J) S = -0.50 (J/K) V = -197.73 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: mafic

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 20.80 (gm) density = 2.39 (gm/cc) viscosity = 4.27 (log 10 poise) (analysis in wt %)
G = -337779.74 (J) H = -271038.53 (J) S = 56.41 (J/K) V = 8.71 (cc) Cp = 28.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.32 | 0.51 | 16.92 | 0.60 | 0.00 | 2.23 | 0.87 | 0.42 | 0.00 | 0.00 | 3.09 | 4.07 | 3.57 | 0.58 | 4.83 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.68 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.53Mg0.30)3Al2Si3O12
G = -120984.68 (J) H = -100204.79 (J) S = 17.56 (J/K) V = 2.23 (cc) Cp = 9.55 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.98 | 17.51 | 29.51 |

orthopyroxene mass = 12.27 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.01Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -166418.15 (J) H = -136038.77 (J) S = 25.68 (J/K) V = 3.50 (cc) Cp = 14.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.41 | 95.36 | 85.76 | 6.33 | -5.94 | 8.58 | 0.32 |

clinopyroxene mass = 24.90 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.81Fe"0.34Mg0.57Fe'"0.08Ti0.06Al0.31Si1.78O6
G = -365867.21 (J) H = -304799.52 (J) S = 51.61 (J/K) V = 7.35 (cc) Cp = 27.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.76 | 13.14 | 34.32 | 14.13 | -3.11 | 10.83 | 5.94 |

clinopyroxene mass = 4.62 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.92Fe"0.26Mg0.35Fe'"0.08Ti0.36Al0.72Si1.26O6
G = -67865.75 (J) H = -56831.00 (J) S = 9.33 (J/K) V = 1.30 (cc) Cp = 5.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.50 | 3.46 | 25.97 | 65.38 | 6.20 | 1.94 | 4.55 |

feldspar mass = 28.38 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.56Ca0.41Al1.41Si2.59O8
G = -467926.14 (J) H = -392875.02 (J) S = 63.43 (J/K) V = 10.76 (cc) Cp = 34.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.61 | 41.46 | 2.93 |

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4214.67 (J) H = -3491.10 (J) S = 0.61 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 79.13 (gm) density = 3.14 (gm/cc)
G = -1193276.60 (J) H = -994240.20 (J) S = 168.23 (J/K) V = 25.24 (cc) Cp = 91.28 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.94 (gm/cc)
G = -1531056.34 (J) H = -1265278.73 (J) S = 224.64 (J/K) V = 33.95 (cc) Cp = 120.23 (J/K)

Oxygen delta moles = -0.00222292 delta grams = -0.0711308
G = 591.36 (J) H = -64.80 (J) S = -0.55 (J/K) V = -218.67 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: mafic

T = 900.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = 0.09  COH = 1.60  IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid  mass = 20.17 (gm)  density = 2.38 (gm/cc)  viscosity = 4.32 (log 10 poise)  (analysis in wt %)
G = -327655.57 (J)  H = -263555.41 (J)  S = 54.64 (J/K)  V = 8.47 (cc)  Cp = 28.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.76 | 0.48 | 16.67 | 0.54 | 0.00 | 2.01 | 0.90 | 0.39 | 0.00 | 0.00 | 3.01 | 4.01 | 3.65 | 0.59 | 4.98 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 9.98 (gm)  density = 3.89 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.53Mg0.29)3Al2Si3O12
G = -138766.38 (J)  H = -115196.74 (J)  S = 20.09 (J/K)  V = 2.57 (cc)  Cp = 10.96 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.21 | 17.55 | 29.24 |

orthopyroxene  mass = 11.60 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.01Fe'''0.02Ti0.00Al0.15Si1.91O6
G = -157210.17 (J)  H = -128852.24 (J)  S = 24.17 (J/K)  V = 3.31 (cc)  Cp = 13.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.19 | 95.44 | 85.83 | 6.14 | -5.78 | 8.24 | 0.32 |

clinopyroxene  mass = 24.76 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.81Fe"0.34Mg0.57Fe'''0.07Ti0.05Al0.30Si1.79O6
G = -364020.30 (J)  H = -304077.99 (J)  S = 51.10 (J/K)  V = 7.32 (cc)  Cp = 27.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.29 | 12.74 | 33.90 | 13.76 | -3.01 | 10.31 | 6.00 |

clinopyroxene  mass = 4.76 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.92Fe"0.26Mg0.35Fe'''0.08Ti0.36Al0.72Si1.26O6
G = -69892.47 (J)  H = -58677.61 (J)  S = 9.56 (J/K)  V = 1.34 (cc)  Cp = 5.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.57 | 3.28 | 25.79 | 66.14 | 6.24 | 1.49 | 4.63 |

feldspar  mass = 28.36 (gm)  density = 2.64 (gm/cc)  (analysis in mole %)
K0.03Na0.57Ca0.40Al1.40Si2.60O8
G = -466883.75 (J)  H = -392808.68 (J)  S = 63.14 (J/K)  V = 10.75 (cc)  Cp = 34.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 56.68 | 40.24 | 3.08 |

apatite  mass = 0.29 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4273.09 (J)  H = -3547.91 (J)  S = 0.62 (J/K)  V = 0.09 (cc)  Cp = 0.33 (J/K)

Total solids  mass = 79.75 (gm)  density = 3.14 (gm/cc)
G = -1201046.16 (J)  H = -1003161.18 (J)  S = 168.68 (J/K)  V = 25.38 (cc)  Cp = 91.87 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.95 (gm/cc)
G = -1528701.73 (J) H = -1266716.59 (J) S = 223.32 (J/K) V = 33.86 (cc) Cp = 119.92 (J/K)

Oxygen delta moles = -0.00243917 delta grams = -0.0780504
G = 642.80 (J) H = -70.23 (J) S = -0.61 (J/K) V = -237.91 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: mafic

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 19.58 (gm) density = 2.37 (gm/cc) viscosity = 4.36 (log 10 poise) (analysis in wt %)
G = -318133.19 (J) H = -256513.50 (J) S = 52.98 (J/K) V = 8.25 (cc) Cp = 27.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.19 | 0.45 | 16.43 | 0.50 | 0.00 | 1.81 | 0.93 | 0.37 | 0.00 | 0.00 | 2.93 | 3.95 | 3.72 | 0.60 | 5.13 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.20 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.53Mg0.29)3Al2Si3O12
G = -155412.46 (J) H = -129312.06 (J) S = 22.44 (J/K) V = 2.88 (cc) Cp = 12.28 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.44 | 17.58 | 28.99 |

orthopyroxene mass = 10.97 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.01Fe'''0.02Ti0.00Al0.14Si1.92O6
G = -148462.44 (J) H = -122005.04 (J) S = 22.75 (J/K) V = 3.13 (cc) Cp = 12.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.95 | 95.52 | 85.86 | 5.96 | -5.62 | 7.91 | 0.32 |

clinopyroxene mass = 24.64 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.82Fe"0.33Mg0.58Fe'''0.07Ti0.05Al0.29Si1.80O6
G = -362365.89 (J) H = -303508.18 (J) S = 50.60 (J/K) V = 7.29 (cc) Cp = 27.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.82 | 12.35 | 33.47 | 13.40 | -2.91 | 9.81 | 6.06 |

clinopyroxene mass = 4.89 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.92Fe"0.26Mg0.35Fe'''0.07Ti0.37Al0.73Si1.26O6
G = -71725.06 (J) H = -60369.05 (J) S = 9.76 (J/K) V = 1.38 (cc) Cp = 5.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.65 | 3.10 | 25.60 | 66.90 | 6.28 | 1.06 | 4.71 |

feldspar mass = 28.35 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.58Ca0.39Al1.39Si2.61O8
G = -465953.31 (J) H = -392835.94 (J) S = 62.86 (J/K) V = 10.75 (cc) Cp = 34.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 57.71 | 39.06 | 3.23 |

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4314.81 (J) H = -3591.05 (J) S = 0.62 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 80.34 (gm) density = 3.15 (gm/cc)
G = -1208233.96 (J) H = -1011621.33 (J) S = 169.03 (J/K) V = 25.52 (cc) Cp = 92.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.96 (gm/cc)
G = -1526367.15 (J) H = -1268134.83 (J) S = 222.01 (J/K) V = 33.77 (cc) Cp = 119.62 (J/K)

Oxygen delta moles = -0.00264267 delta grams = -0.0845623
G = 689.85 (J) H = -75.15 (J) S = -0.66 (J/K) V = -255.57 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: mafic

T = 880.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.07 COH = 1.54 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 19.03 (gm) density = 2.37 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -309155.54 (J) H = -249871.25 (J) S = 51.41 (J/K) V = 8.03 (cc) Cp = 26.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.58 | 0.43 | 16.19 | 0.45 | 0.00 | 1.63 | 0.95 | 0.35 | 0.00 | 0.00 | 2.86 | 3.88 | 3.78 | 0.62 | 5.28 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.35 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.54Mg0.29)3Al2Si3O12
G = -171026.47 (J) H = -142630.67 (J) S = 24.62 (J/K) V = 3.17 (cc) Cp = 13.53 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.65 | 17.60 | 28.75 |

orthopyroxene mass = 10.37 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.02Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -140138.56 (J) H = -115469.82 (J) S = 21.39 (J/K) V = 2.96 (cc) Cp = 11.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.69 | 95.60 | 85.87 | 5.78 | -5.47 | 7.60 | 0.31 |

clinopyroxene mass = 24.53 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.82Fe"0.33Mg0.58Fe'"0.07Ti0.05Al0.28Si1.80O6
G = -360889.28 (J) H = -303078.78 (J) S = 50.13 (J/K) V = 7.26 (cc) Cp = 27.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.34 | 11.98 | 33.02 | 13.04 | -2.81 | 9.32 | 6.12 |

clinopyroxene mass = 5.00 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.92Fe"0.25Mg0.35Fe'"0.07Ti0.37Al0.73Si1.25O6
G = -73383.93 (J) H = -61921.22 (J) S = 9.94 (J/K) V = 1.41 (cc) Cp = 5.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.74 | 2.94 | 25.40 | 67.65 | 6.31 | 0.65 | 4.79 |

feldspar mass = 28.34 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.59Ca0.38Al1.38Si2.62O8
G = -465117.74 (J) H = -392942.74 (J) S = 62.59 (J/K) V = 10.76 (cc) Cp = 34.24 (J/K)

albite anorthite sanidine
58.69 37.91 3.39

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4340.58 (J) H = -3621.05 (J) S = 0.62 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 80.88 (gm) density = 3.15 (gm/cc)
G = -1214896.57 (J) H = -1019664.28 (J) S = 169.30 (J/K) V = 25.65 (cc) Cp = 92.93 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.97 (gm/cc)
G = -1524052.12 (J) H = -1269535.53 (J) S = 220.71 (J/K) V = 33.69 (cc) Cp = 119.34 (J/K)

Oxygen delta moles = -0.00283412 delta grams = -0.0906884
G = 732.78 (J) H = -79.59 (J) S = -0.70 (J/K) V = -271.72 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: mafic

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 18.51 (gm) density = 2.36 (gm/cc) viscosity = 4.44 (log 10 poise) (analysis in wt %)
G = -300672.98 (J) H = -243592.49 (J) S = 49.93 (J/K) V = 7.83 (cc) Cp = 25.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.96 | 0.40 | 15.95 | 0.41 | 0.00 | 1.46 | 0.98 | 0.33 | 0.00 | 0.00 | 2.80 | 3.81 | 3.84 | 0.63 | 5.43 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.44 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.54Mg0.29)3Al2Si3O12
G = -185699.22 (J) H = -155222.58 (J) S = 26.66 (J/K) V = 3.45 (cc) Cp = 14.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.87 | 17.62 | 28.51 |

orthopyroxene mass = 9.79 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.02Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -132206.03 (J) H = -109222.19 (J) S = 20.11 (J/K) V = 2.79 (cc) Cp = 11.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.43 | 95.69 | 85.85 | 5.61 | -5.31 | 7.29 | 0.31 |

clinopyroxene mass = 24.43 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.82Fe"0.33Mg0.59Fe'"0.06Ti0.05Al0.28Si1.81O6
G = -359576.87 (J) H = -302779.27 (J) S = 49.69 (J/K) V = 7.24 (cc) Cp = 27.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.86 | 11.62 | 32.55 | 12.68 | -2.72 | 8.85 | 6.17 |

clinopyroxene mass = 5.10 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.92Fe"0.25Mg0.35Fe'"0.07Ti0.37Al0.74Si1.25O6
G = -74887.11 (J) H = -63348.17 (J) S = 10.09 (J/K) V = 1.44 (cc) Cp = 5.57 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-7.82 2.78 25.19 68.38 6.34 0.25 4.87

feldspar mass = 28.33 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.60Ca0.37Al1.37Si2.63O8
G = -464363.07 (J) H = -393117.54 (J) S = 62.32 (J/K) V = 10.76 (cc) Cp = 34.22 (J/K)
albite anorthite sanidine
59.64 36.80 3.56

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4350.90 (J) H = -3638.22 (J) S = 0.62 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 81.40 (gm) density = 3.16 (gm/cc)
G = -1221083.20 (J) H = -1027327.97 (J) S = 169.49 (J/K) V = 25.77 (cc) Cp = 93.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.97 (gm/cc)
G = -1521756.18 (J) H = -1270920.46 (J) S = 219.43 (J/K) V = 33.61 (cc) Cp = 119.06 (J/K)

Oxygen delta moles = -0.00301416 delta grams = -0.0964496
G = 771.84 (J) H = -83.58 (J) S = -0.75 (J/K) V = -286.48 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 860.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.06 COH = 1.48 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 18.02 (gm) density = 2.36 (gm/cc) viscosity = 4.47 (log 10 poise) (analysis in wt %)
G = -292642.22 (J) H = -237645.68 (J) S = 48.53 (J/K) V = 7.64 (cc) Cp = 24.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.31 | 0.38 | 15.71 | 0.38 | 0.00 | 1.31 | 1.01 | 0.31 | 0.00 | 0.00 | 2.74 | 3.73 | 3.90 | 0.65 | 5.57 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.47 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.54Mg0.28)3Al2Si3O12
G = -199510.74 (J) H = -167149.46 (J) S = 28.56 (J/K) V = 3.71 (cc) Cp = 15.80 (J/K)
almandine grossular pyrope
54.08 17.63 28.29

orthopyroxene mass = 9.24 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.03Fe'''0.02Ti0.00Al0.13Si1.93O6
G = -124635.63 (J) H = -103240.29 (J) S = 18.88 (J/K) V = 2.64 (cc) Cp = 10.63 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-89.16 95.78 85.80 5.44 -5.17 7.00 0.31

clinopyroxene mass = 24.34 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.32Mg0.60Fe'''0.06Ti0.05Al0.27Si1.82O6
G = -358416.10 (J) H = -302599.95 (J) S = 49.26 (J/K) V = 7.21 (cc) Cp = 27.21 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
32.37 11.26 32.06 12.33 -2.63 8.39 6.22

clinopyroxene mass = 5.20 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.92Fe"0.25Mg0.35Fe'"0.06Ti0.38Al0.74Si1.25O6
G = -76250.50 (J) H = -64662.34 (J) S = 10.23 (J/K) V = 1.46 (cc) Cp = 5.67 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-7.90 2.63 24.98 69.10 6.36 -0.14 4.95

feldspar mass = 28.33 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.61Ca0.36Al1.36Si2.64O8
G = -463677.75 (J) H = -393350.80 (J) S = 62.06 (J/K) V = 10.77 (cc) Cp = 34.20 (J/K)
albite anorthite sanidine
60.55 35.72 3.72

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4345.98 (J) H = -3642.66 (J) S = 0.62 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 81.88 (gm) density = 3.16 (gm/cc)
G = -1226836.70 (J) H = -1034645.49 (J) S = 169.61 (J/K) V = 25.89 (cc) Cp = 93.85 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.98 (gm/cc)
G = -1519478.92 (J) H = -1272291.17 (J) S = 218.14 (J/K) V = 33.53 (cc) Cp = 118.80 (J/K)

Oxygen delta moles = -0.00318343 delta grams = -0.101866
G = 807.29 (J) H = -87.15 (J) S = -0.79 (J/K) V = -299.92 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 850.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.05 COH = 1.46 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 17.55 (gm) density = 2.35 (gm/cc) viscosity = 4.50 (log 10 poise) (analysis in wt %)
G = -285025.37 (J) H = -232003.22 (J) S = 47.21 (J/K) V = 7.46 (cc) Cp = 24.29 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.64 0.36 15.47 0.34 0.00 1.18 1.04 0.29 0.00 0.00 2.69 3.65 3.96 0.67 5.72 0.00 0.00 0.00 0.00

garnet mass = 15.45 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.54Mg0.28)3Al2Si3O12
G = -212531.93 (J) H = -178465.87 (J) S = 30.33 (J/K) V = 3.96 (cc) Cp = 16.85 (J/K)
almandine grossular pyrope
54.29 17.65 28.07

orthopyroxene mass = 8.71 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.03Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -117400.94 (J) H = -97504.40 (J) S = 17.71 (J/K) V = 2.49 (cc) Cp = 10.02 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-88.87 95.87 85.73 5.27 -5.02 6.71 0.30

clinopyroxene mass = 24.26 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.32Mg0.60Fe'"0.05Ti0.05Al0.26Si1.83O6
G = -357395.55 (J) H = -302531.97 (J) S = 48.85 (J/K) V = 7.20 (cc) Cp = 27.12 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
33.88 10.91 31.55 11.99 -2.54 7.95 6.26

clinopyroxene mass = 5.28 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.92Fe"0.25Mg0.35Fe'"0.06Ti0.38Al0.74Si1.24O6
G = -77488.17 (J) H = -65874.73 (J) S = 10.34 (J/K) V = 1.49 (cc) Cp = 5.75 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-7.98 2.49 24.77 69.81 6.38 -0.51 5.04

feldspar mass = 28.34 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.61Ca0.35Al1.35Si2.65O8
G = -463052.15 (J) H = -393634.54 (J) S = 61.81 (J/K) V = 10.77 (cc) Cp = 34.19 (J/K)
albite anorthite sanidine
61.43 34.67 3.90

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4325.84 (J) H = -3634.28 (J) S = 0.62 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 82.34 (gm) density = 3.17 (gm/cc)
G = -1232194.58 (J) H = -1041645.78 (J) S = 169.66 (J/K) V = 26.00 (cc) Cp = 94.26 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.99 (gm/cc)
G = -1517219.96 (J) H = -1273649.01 (J) S = 216.86 (J/K) V = 33.46 (cc) Cp = 118.55 (J/K)

Oxygen delta moles = -0.0033425 delta grams = -0.106956
G = 839.34 (J) H = -90.32 (J) S = -0.83 (J/K) V = -312.13 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 17.11 (gm) density = 2.35 (gm/cc) viscosity = 4.53 (log 10 poise) (analysis in wt %)
G = -277789.26 (J) H = -226640.96 (J) S = 45.95 (J/K) V = 7.29 (cc) Cp = 23.66 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.96 0.34 15.24 0.31 0.00 1.06 1.06 0.28 0.00 0.00 2.64 3.56 4.01 0.69 5.87 0.00 0.00 0.00 0.00

garnet mass = 16.38 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.54Mg0.28)3Al2Si3O12
G = -224825.84 (J) H = -189220.31 (J) S = 31.99 (J/K) V = 4.19 (cc) Cp = 17.83 (J/K)

almandine grossular pyrope
54.49 17.65 27.86

orthopyroxene mass = 8.21 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.03Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -110478.03 (J) H = -91996.64 (J) S = 16.60 (J/K) V = 2.34 (cc) Cp = 9.43 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-88.59 95.97 85.64 5.12 -4.88 6.44 0.30

clinopyroxene mass = 24.19 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.31Mg0.61Fe'"0.05Ti0.05Al0.25Si1.83O6
G = -356504.82 (J) H = -302567.27 (J) S = 48.45 (J/K) V = 7.18 (cc) Cp = 27.03 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
35.37 10.57 31.03 11.65 -2.45 7.52 6.31

clinopyroxene mass = 5.36 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.25Mg0.35Fe'"0.06Ti0.38Al0.75Si1.24O6
G = -78612.60 (J) H = -66995.14 (J) S = 10.44 (J/K) V = 1.51 (cc) Cp = 5.84 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-8.06 2.36 24.54 70.51 6.40 -0.87 5.12

feldspar mass = 28.34 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.62Ca0.34Al1.34Si2.66O8
G = -462478.16 (J) H = -393962.05 (J) S = 61.55 (J/K) V = 10.78 (cc) Cp = 34.19 (J/K)
albite anorthite sanidine
62.28 33.65 4.07

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4290.22 (J) H = -3612.78 (J) S = 0.61 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 82.77 (gm) density = 3.17 (gm/cc)
G = -1237189.68 (J) H = -1048354.19 (J) S = 169.64 (J/K) V = 26.10 (cc) Cp = 94.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 2.99 (gm/cc)
G = -1514978.94 (J) H = -1274995.15 (J) S = 215.59 (J/K) V = 33.39 (cc) Cp = 118.31 (J/K)

Oxygen delta moles = -0.00349195 delta grams = -0.111738
G = 868.23 (J) H = -93.13 (J) S = -0.86 (J/K) V = -323.18 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 16.70 (gm) density = 2.34 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -270904.71 (J) H = -221537.68 (J) S = 44.75 (J/K) V = 7.12 (cc) Cp = 23.07 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

65.25 0.32 15.01 0.28 0.00 0.95 1.09 0.26 0.00 0.00 2.60 3.47 4.05 0.71 6.01 0.00 0.00 0.00 0.00

garnet mass = 17.26 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.55Mg0.28)3Al2Si3O12
G = -236448.81 (J) H = -199456.09 (J) S = 33.53 (J/K) V = 4.42 (cc) Cp = 18.77 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.69 | 17.65 | 27.65 |

orthopyroxene mass = 7.72 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.86Mg1.04Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -103845.07 (J) H = -86700.73 (J) S = 15.54 (J/K) V = 2.20 (cc) Cp = 8.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.30 | 96.06 | 85.54 | 4.96 | -4.74 | 6.18 | 0.29 |

clinopyroxene mass = 24.12 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.83Fe"0.30Mg0.62Fe'"0.05Ti0.04Al0.25Si1.84O6
G = -355734.48 (J) H = -302698.55 (J) S = 48.08 (J/K) V = 7.17 (cc) Cp = 26.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.86 | 10.24 | 30.49 | 11.32 | -2.37 | 7.11 | 6.35 |

clinopyroxene mass = 5.43 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.24Mg0.35Fe'"0.05Ti0.39Al0.75Si1.24O6
G = -79634.85 (J) H = -68032.25 (J) S = 10.52 (J/K) V = 1.53 (cc) Cp = 5.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.14 | 2.23 | 24.32 | 71.18 | 6.42 | -1.21 | 5.20 |

feldspar mass = 28.35 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.63Ca0.33Al1.33Si2.67O8
G = -461948.98 (J) H = -394327.66 (J) S = 61.30 (J/K) V = 10.79 (cc) Cp = 34.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.09 | 32.66 | 4.25 |

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4238.64 (J) H = -3577.67 (J) S = 0.60 (J/K) V = 0.09 (cc) Cp = 0.33 (J/K)

Total solids mass = 83.19 (gm) density = 3.17 (gm/cc)
G = -1241850.83 (J) H = -1054792.95 (J) S = 169.57 (J/K) V = 26.20 (cc) Cp = 95.02 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.00 (gm/cc)
G = -1512755.54 (J) H = -1276330.64 (J) S = 214.32 (J/K) V = 33.32 (cc) Cp = 118.09 (J/K)

Oxygen delta moles = -0.0036323 delta grams = -0.116229
G = 894.15 (J) H = -95.59 (J) S = -0.90 (J/K) V = -333.15 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 820.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = 0.02 COH = 1.37 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 16.30 (gm) density = 2.34 (gm/cc) viscosity = 4.59 (log 10 poise) (analysis in wt %)
G = -264346.08 (J) H = -216674.77 (J) S = 43.61 (J/K) V = 6.96 (cc) Cp = 22.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.53 | 0.30 | 14.78 | 0.26 | 0.00 | 0.85 | 1.11 | 0.25 | 0.00 | 0.00 | 2.56 | 3.37 | 4.09 | 0.74 | 6.16 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 18.10 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.55Mg0.27)3Al2Si3O12
G = -247451.30 (J) H = -209211.97 (J) S = 34.98 (J/K) V = 4.63 (cc) Cp = 19.65 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.90 | 17.65 | 27.45 |

orthopyroxene mass = 7.26 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.85Mg1.04Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -97482.14 (J) H = -81601.84 (J) S = 14.53 (J/K) V = 2.07 (cc) Cp = 8.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.00 | 96.16 | 85.41 | 4.81 | -4.60 | 5.93 | 0.29 |

clinopyroxene mass = 24.07 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.30Mg0.63Fe'"0.04Ti0.04Al0.24Si1.85O6
G = -355076.01 (J) H = -302919.22 (J) S = 47.71 (J/K) V = 7.16 (cc) Cp = 26.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.33 | 9.91 | 29.94 | 10.99 | -2.28 | 6.72 | 6.38 |

clinopyroxene mass = 5.50 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.24Mg0.35Fe'"0.05Ti0.39Al0.76Si1.23O6
G = -80564.76 (J) H = -68993.81 (J) S = 10.58 (J/K) V = 1.55 (cc) Cp = 5.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.22 | 2.11 | 24.08 | 71.84 | 6.44 | -1.55 | 5.28 |

feldspar mass = 28.36 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.64Ca0.32Al1.32Si2.68O8
G = -461458.82 (J) H = -394726.58 (J) S = 61.05 (J/K) V = 10.80 (cc) Cp = 34.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.87 | 31.70 | 4.43 |

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4170.37 (J) H = -3528.22 (J) S = 0.59 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 83.58 (gm) density = 3.18 (gm/cc)
G = -1246203.39 (J) H = -1060981.64 (J) S = 169.44 (J/K) V = 26.29 (cc) Cp = 95.37 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.00 (gm/cc)
G = -1510549.46 (J) H = -1277656.41 (J) S = 213.05 (J/K) V = 33.26 (cc) Cp = 117.87 (J/K)

Oxygen delta moles = -0.00376406 delta grams = -0.120445
G = 917.29 (J) H = -97.73 (J) S = -0.93 (J/K) V = -342.11 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 810.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -13.66  delta HM = -5.12  NNO = 0.00  QFM = 0.01  COH = 1.33  IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid  mass = 15.93 (gm)  density = 2.34 (gm/cc)  viscosity = 4.62 (log 10 poise)  (analysis in wt %)
G = -258090.77 (J)  H = -212035.86 (J)  S = 42.52 (J/K)  V = 6.81 (cc)  Cp = 21.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.78 | 0.28 | 14.55 | 0.23 | 0.00 | 0.76 | 1.14 | 0.24 | 0.00 | 0.00 | 2.54 | 3.27 | 4.13 | 0.77 | 6.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 18.91 (gm)  density = 3.91 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.55Mg0.27)3Al2Si3O12
G = -257878.68 (J)  H = -218522.78 (J)  S = 36.33 (J/K)  V = 4.83 (cc)  Cp = 20.49 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.10 | 17.65 | 27.26 |

orthopyroxene  mass = 6.81 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.05Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -91370.97 (J)  H = -76686.35 (J)  S = 13.56 (J/K)  V = 1.94 (cc)  Cp = 7.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.70 | 96.26 | 85.27 | 4.66 | -4.47 | 5.69 | 0.28 |

clinopyroxene  mass = 24.02 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.29Mg0.63Fe'"0.04Ti0.04Al0.23Si1.85O6
G = -354521.73 (J)  H = -303223.31 (J)  S = 47.36 (J/K)  V = 7.15 (cc)  Cp = 26.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.80 | 9.59 | 29.37 | 10.67 | -2.20 | 6.34 | 6.42 |

clinopyroxene  mass = 5.56 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.24Mg0.35Fe'"0.05Ti0.39Al0.76Si1.23O6
G = -81411.09 (J)  H = -69886.74 (J)  S = 10.64 (J/K)  V = 1.56 (cc)  Cp = 6.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.30 | 2.00 | 23.85 | 72.49 | 6.46 | -1.87 | 5.37 |

feldspar  mass = 28.38 (gm)  density = 2.63 (gm/cc)  (analysis in mole %)
K0.05Na0.65Ca0.31Al1.31Si2.69O8
G = -461002.82 (J)  H = -395154.79 (J)  S = 60.79 (J/K)  V = 10.81 (cc)  Cp = 34.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.63 | 30.75 | 4.62 |

apatite  mass = 0.28 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4084.37 (J)  H = -3463.47 (J)  S = 0.57 (J/K)  V = 0.09 (cc)  Cp = 0.31 (J/K)

Total solids  mass = 83.95 (gm)  density = 3.18 (gm/cc)
G = -1250269.66 (J)  H = -1066937.44 (J)  S = 169.26 (J/K)  V = 26.38 (cc)  Cp = 95.71 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.01 (gm/cc)
G = -1508360.44 (J) H = -1278973.30 (J) S = 211.78 (J/K) V = 33.20 (cc) Cp = 117.67 (J/K)

Oxygen delta moles = -0.00388769 delta grams = -0.124401
G = 937.84 (J) H = -99.57 (J) S = -0.96 (J/K) V = -350.11 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 15.57 (gm) density = 2.33 (gm/cc) viscosity = 4.64 (log 10 poise) (analysis in wt %)
G = -252118.90 (J) H = -207606.61 (J) S = 41.48 (J/K) V = 6.67 (cc) Cp = 21.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.02 | 0.26 | 14.33 | 0.21 | 0.00 | 0.67 | 1.17 | 0.22 | 0.00 | 0.00 | 2.52 | 3.17 | 4.16 | 0.81 | 6.45 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.67 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.55Mg0.27)3Al2Si3O12
G = -267771.85 (J) H = -227419.87 (J) S = 37.60 (J/K) V = 5.02 (cc) Cp = 21.29 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.29 | 17.64 | 27.07 |

orthopyroxene mass = 6.38 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.05Fe'''0.01Ti0.00Al0.10Si1.94O6
G = -85494.84 (J) H = -71941.82 (J) S = 12.63 (J/K) V = 1.82 (cc) Cp = 7.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.40 | 96.36 | 85.12 | 4.52 | -4.34 | 5.46 | 0.28 |

clinopyroxene mass = 23.97 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.84Fe"0.29Mg0.64Fe'''0.04Ti0.04Al0.23Si1.86O6
G = -354064.68 (J) H = -303605.43 (J) S = 47.02 (J/K) V = 7.14 (cc) Cp = 26.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 41.25 | 9.28 | 28.80 | 10.36 | -2.11 | 5.98 | 6.45 |

clinopyroxene mass = 5.61 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.93Fe"0.24Mg0.35Fe'''0.04Ti0.40Al0.76Si1.23O6
G = -82181.69 (J) H = -70717.23 (J) S = 10.68 (J/K) V = 1.58 (cc) Cp = 6.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.37 | 1.89 | 23.61 | 73.12 | 6.48 | -2.17 | 5.45 |

feldspar mass = 28.39 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.65Ca0.30Al1.30Si2.70O8
G = -460576.94 (J) H = -395608.97 (J) S = 60.54 (J/K) V = 10.82 (cc) Cp = 34.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.35 | 29.84 | 4.81 |

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3979.32 (J) H = -3382.18 (J) S = 0.56 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 84.30 (gm) density = 3.18 (gm/cc)
G = -1254069.32 (J) H = -1072675.50 (J) S = 169.03 (J/K) V = 26.47 (cc) Cp = 96.04 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.01 (gm/cc)
G = -1506188.22 (J) H = -1280282.11 (J) S = 210.51 (J/K) V = 33.14 (cc) Cp = 117.49 (J/K)

Oxygen delta moles = -0.00400365 delta grams = -0.128112
G = 955.95 (J) H = -101.13 (J) S = -0.99 (J/K) V = -357.23 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 15.23 (gm) density = 2.33 (gm/cc) viscosity = 4.67 (log 10 poise) (analysis in wt %)
G = -246412.95 (J) H = -203374.44 (J) S = 40.48 (J/K) V = 6.53 (cc) Cp = 20.97 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.25 | 0.25 | 14.11 | 0.19 | 0.00 | 0.60 | 1.19 | 0.21 | 0.00 | 0.00 | 2.50 | 3.06 | 4.19 | 0.85 | 6.60 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 20.41 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.55Mg0.27)3Al2Si3O12
G = -277167.71 (J) H = -235931.54 (J) S = 38.79 (J/K) V = 5.21 (cc) Cp = 22.05 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.49 | 17.62 | 26.88 |

orthopyroxene mass = 5.96 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.06Fe'''0.01Ti0.00Al0.10Si1.95O6
G = -79838.37 (J) H = -67356.78 (J) S = 11.74 (J/K) V = 1.70 (cc) Cp = 6.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.09 | 96.46 | 84.95 | 4.37 | -4.21 | 5.24 | 0.27 |

clinopyroxene mass = 23.93 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.85Fe"0.28Mg0.65Fe'''0.04Ti0.04Al0.22Si1.86O6
G = -353698.57 (J) H = -304060.71 (J) S = 46.69 (J/K) V = 7.13 (cc) Cp = 26.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.69 | 8.98 | 28.21 | 10.05 | -2.03 | 5.62 | 6.48 |

clinopyroxene mass = 5.66 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.23Mg0.35Fe'''0.04Ti0.40Al0.77Si1.22O6
G = -82883.57 (J) H = -71490.85 (J) S = 10.72 (J/K) V = 1.59 (cc) Cp = 6.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.44 | 1.79 | 23.36 | 73.73 | 6.50 | -2.47 | 5.53 |

feldspar mass = 28.41 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.66Ca0.29Al1.29Si2.71O8
G = -460177.90 (J) H = -396086.44 (J) S = 60.28 (J/K) V = 10.83 (cc) Cp = 34.33 (J/K)

albite anorthite sanidine
66.05 28.94 5.00

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3853.53 (J) H = -3282.80 (J) S = 0.54 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 84.64 (gm) density = 3.19 (gm/cc)
G = -1257619.64 (J) H = -1078209.12 (J) S = 168.75 (J/K) V = 26.55 (cc) Cp = 96.36 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.02 (gm/cc)
G = -1504032.58 (J) H = -1281583.56 (J) S = 209.24 (J/K) V = 33.08 (cc) Cp = 117.32 (J/K)

Oxygen delta moles = -0.00411237 delta grams = -0.131591
G = 971.80 (J) H = -102.43 (J) S = -1.01 (J/K) V = -363.51 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 780.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.02 COH = 1.24 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 14.91 (gm) density = 2.33 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -240957.50 (J) H = -199328.35 (J) S = 39.53 (J/K) V = 6.40 (cc) Cp = 20.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.45 | 0.23 | 13.88 | 0.17 | 0.00 | 0.53 | 1.22 | 0.20 | 0.00 | 0.00 | 2.50 | 2.95 | 4.21 | 0.90 | 6.74 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 21.11 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.56Mg0.27)3Al2Si3O12
G = -286099.63 (J) H = -244083.33 (J) S = 39.90 (J/K) V = 5.38 (cc) Cp = 22.77 (J/K)
almandine grossular pyrope
55.69 17.61 26.70

orthopyroxene mass = 5.56 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.85Mg1.06Fe'''0.01Ti0.00Al0.10Si1.95O6
G = -74387.45 (J) H = -62920.75 (J) S = 10.89 (J/K) V = 1.59 (cc) Cp = 6.36 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-86.78 96.57 84.77 4.24 -4.08 5.03 0.27

clinopyroxene mass = 23.90 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.85Fe"0.28Mg0.65Fe'''0.03Ti0.04Al0.22Si1.87O6
G = -353417.67 (J) H = -304584.73 (J) S = 46.37 (J/K) V = 7.13 (cc) Cp = 26.67 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
44.11 8.67 27.61 9.75 -1.94 5.29 6.51

clinopyroxene mass = 5.71 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.23Mg0.35Fe'''0.04Ti0.40Al0.77Si1.22O6
G = -83523.04 (J) H = -72212.60 (J) S = 10.74 (J/K) V = 1.60 (cc) Cp = 6.18 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-8.51 1.69 23.12 74.32 6.52 -2.76 5.62

feldspar mass = 28.43 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.67Ca0.28Al1.28Si2.72O8
G = -459803.16 (J) H = -396585.22 (J) S = 60.03 (J/K) V = 10.84 (cc) Cp = 34.41 (J/K)
albite anorthite sanidine
66.72 28.07 5.20

apatite mass = 0.26 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3704.87 (J) H = -3163.40 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.28 (J/K)

Total solids mass = 84.96 (gm) density = 3.19 (gm/cc)
G = -1260935.82 (J) H = -1083550.03 (J) S = 168.43 (J/K) V = 26.63 (cc) Cp = 96.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.02 (gm/cc)
G = -1501893.33 (J) H = -1282878.38 (J) S = 207.96 (J/K) V = 33.02 (cc) Cp = 117.18 (J/K)

Oxygen delta moles = -0.00421424 delta grams = -0.134851
G = 985.53 (J) H = -103.49 (J) S = -1.03 (J/K) V = -369.01 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 12.93 (gm) density = 2.32 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -208929.52 (J) H = -172785.12 (J) S = 34.65 (J/K) V = 5.57 (cc) Cp = 17.86 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.99 0.20 13.45 0.18 0.00 0.53 1.41 0.19 0.00 0.00 2.58 3.22 3.88 1.00 7.37 0.00 0.00 0.00 0.00

garnet mass = 23.03 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.56Mg0.26)3Al2Si3O12
G = -310978.54 (J) H = -265854.36 (J) S = 43.26 (J/K) V = 5.87 (cc) Cp = 24.78 (J/K)
almandine grossular pyrope
56.38 17.61 26.01

orthopyroxene mass = 3.34 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.86Mg1.05Fe'''0.01Ti0.00Al0.09Si1.95O6
G = -44474.94 (J) H = -37696.28 (J) S = 6.50 (J/K) V = 0.95 (cc) Cp = 3.81 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-88.17 96.72 86.15 4.12 -3.98 4.89 0.27

clinopyroxene mass = 23.98 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.85Fe"0.28Mg0.65Fe'''0.03Ti0.04Al0.21Si1.87O6
G = -353990.19 (J) H = -305744.51 (J) S = 46.25 (J/K) V = 7.15 (cc) Cp = 26.72 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
44.48 8.41 27.74 9.38 -1.68 4.95 6.72

clinopyroxene mass = 5.77 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.23Mg0.35Fe'"0.04Ti0.41Al0.77Si1.22O6
G = -84339.50 (J) H = -73072.05 (J) S = 10.80 (J/K) V = 1.62 (cc) Cp = 6.24 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-8.94 1.60 23.39 74.44 6.77 -3.12 5.86

biotite mass = 1.21 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -19331.24 (J) H = -16583.70 (J) S = 2.63 (J/K) V = 0.44 (cc) Cp = 1.53 (J/K)
annite phlogopite
2.67 97.33

feldspar mass = 27.99 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -452153.53 (J) H = -390788.95 (J) S = 58.83 (J/K) V = 10.68 (cc) Cp = 33.98 (J/K)
albite anorthite sanidine
68.16 26.77 5.07

quartz mass = 1.34 (gm) density = 2.55 (gm/cc)
SiO2
G = -21733.47 (J) H = -18958.44 (J) S = 2.66 (J/K) V = 0.53 (cc) Cp = 1.56 (J/K)

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3861.21 (J) H = -3304.43 (J) S = 0.53 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 86.94 (gm) density = 3.18 (gm/cc)
G = -1290862.62 (J) H = -1112002.70 (J) S = 171.46 (J/K) V = 27.32 (cc) Cp = 98.92 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.04 (gm/cc)
G = -1499792.15 (J) H = -1284787.83 (J) S = 206.11 (J/K) V = 32.89 (cc) Cp = 116.78 (J/K)

Oxygen delta moles = -0.00427038 delta grams = -0.136647
G = 988.18 (J) H = -103.37 (J) S = -1.05 (J/K) V = -370.37 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 9.87 (gm) density = 2.30 (gm/cc) viscosity = 3.71 (log 10 poise) (analysis in wt %)
G = -159614.30 (J) H = -131454.91 (J) S = 27.26 (J/K) V = 4.30 (cc) Cp = 13.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.28 | 0.15 | 12.78 | 0.21 | 0.00 | 0.60 | 1.84 | 0.18 | 0.00 | 0.00 | 2.82 | 3.97 | 3.16 | 1.22 | 8.79 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.68 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.57Mg0.25)3Al2Si3O12
G = -344984.42 (J) H = -295492.40 (J) S = 47.90 (J/K) V = 6.53 (cc) Cp = 27.55 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.43 | 17.62 | 24.95 |

clinopyroxene mass = 24.15 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.85Fe"0.28Mg0.64Fe'"0.03Ti0.04Al0.21Si1.88O6
G = -355415.85 (J) H = -307567.28 (J) S = 46.31 (J/K) V = 7.20 (cc) Cp = 26.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 43.98 | 8.17 | 28.43 | 8.98 | -1.27 | 4.61 | 7.11 |

clinopyroxene mass = 5.84 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.24Mg0.34Fe'"0.04Ti0.41Al0.77Si1.22O6
G = -84998.03 (J) H = -73783.21 (J) S = 10.85 (J/K) V = 1.64 (cc) Cp = 6.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.64 | 1.52 | 24.06 | 74.16 | 7.21 | -3.57 | 6.26 |

biotite mass = 3.19 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -50689.80 (J) H = -43579.25 (J) S = 6.88 (J/K) V = 1.16 (cc) Cp = 4.02 (J/K)

| annite | phlogopite |
|---|---|
| 2.92 | 97.08 |

feldspar mass = 27.23 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.70Ca0.25Al1.25Si2.75O8
G = -439377.67 (J) H = -380530.09 (J) S = 56.96 (J/K) V = 10.40 (cc) Cp = 33.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.23 | 25.22 | 4.56 |

quartz mass = 3.61 (gm) density = 2.55 (gm/cc)
SiO2
G = -58500.07 (J) H = -51134.80 (J) S = 7.13 (J/K) V = 1.42 (cc) Cp = 4.19 (J/K)

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4154.51 (J) H = -3563.54 (J) S = 0.57 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 89.99 (gm) density = 3.17 (gm/cc)
G = -1338120.35 (J) H = -1155650.56 (J) S = 176.61 (J/K) V = 28.42 (cc) Cp = 102.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.05 (gm/cc)
G = -1497734.65 (J) H = -1287105.47 (J) S = 203.87 (J/K) V = 32.72 (cc) Cp = 116.24 (J/K)

Oxygen delta moles = -0.00428542 delta grams = -0.137128
G = 981.17 (J) H = -102.24 (J) S = -1.05 (J/K) V = -368.11 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13

IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 8.18 (gm) density = 2.27 (gm/cc) viscosity = 3.15 (log 10 poise) (analysis in wt %)
G = -132425.71 (J) H = -108705.62 (J) S = 23.18 (J/K) V = 3.60 (cc) Cp = 11.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.16 | 0.12 | 12.56 | 0.22 | 0.00 | 0.60 | 2.22 | 0.16 | 0.00 | 0.00 | 3.16 | 4.31 | 2.80 | 1.50 | 10.18 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.76 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.58Mg0.24)3Al2Si3O12
G = -344810.64 (J) H = -296000.51 (J) S = 47.71 (J/K) V = 6.54 (cc) Cp = 27.54 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.87 | 18.50 | 23.63 |

clinopyroxene mass = 23.36 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.85Fe"0.28Mg0.63Fe'"0.03Ti0.04Al0.21Si1.88O6
G = -343176.63 (J) H = -297640.43 (J) S = 44.51 (J/K) V = 6.95 (cc) Cp = 25.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 44.67 | 7.41 | 28.46 | 8.92 | -1.38 | 4.70 | 7.23 |

clinopyroxene mass = 5.98 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.92Fe"0.25Mg0.33Fe'"0.04Ti0.41Al0.77Si1.22O6
G = -86900.97 (J) H = -75593.34 (J) S = 11.05 (J/K) V = 1.68 (cc) Cp = 6.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.30 | 1.35 | 24.53 | 74.67 | 7.09 | -3.55 | 6.21 |

biotite mass = 3.99 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -63342.90 (J) H = -54576.14 (J) S = 8.57 (J/K) V = 1.45 (cc) Cp = 5.02 (J/K)

| annite | phlogopite |
|---|---|
| 3.12 | 96.88 |

feldspar mass = 27.73 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.70Ca0.25Al1.25Si2.75O8
G = -446905.45 (J) H = -387903.67 (J) S = 57.67 (J/K) V = 10.58 (cc) Cp = 33.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.27 | 25.41 | 4.31 |

quartz mass = 4.58 (gm) density = 2.55 (gm/cc)
SiO2
G = -74061.37 (J) H = -64868.74 (J) S = 8.98 (J/K) V = 1.79 (cc) Cp = 5.30 (J/K)

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4056.70 (J) H = -3487.54 (J) S = 0.56 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 91.68 (gm) density = 3.15 (gm/cc)
G = -1363254.65 (J) H = -1180070.37 (J) S = 179.04 (J/K) V = 29.08 (cc) Cp = 104.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.06 (gm/cc)
G = -1495680.36 (J) H = -1288775.98 (J) S = 202.22 (J/K) V = 32.68 (cc) Cp = 116.10 (J/K)

Oxygen delta moles = -0.00433113 delta grams = -0.138591
G = 981.05 (J) H = -101.82 (J) S = -1.06 (J/K) V = -368.44 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 6.48 (gm) density = 2.24 (gm/cc) viscosity = 2.36 (log 10 poise) (analysis in wt %)
G = -105006.85 (J) H = -85654.71 (J) S = 19.10 (J/K) V = 2.89 (cc) Cp = 9.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.53 | 0.08 | 12.22 | 0.23 | 0.00 | 0.62 | 2.80 | 0.14 | 0.00 | 0.00 | 3.81 | 4.80 | 2.35 | 2.05 | 12.36 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.85 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.58Mg0.22)3Al2Si3O12
G = -344957.99 (J) H = -296795.53 (J) S = 47.54 (J/K) V = 6.55 (cc) Cp = 27.56 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.22 | 19.41 | 22.38 |

clinopyroxene mass = 22.60 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.86Fe"0.28Mg0.62Fe'"0.03Ti0.04Al0.21Si1.88O6
G = -331596.20 (J) H = -288236.15 (J) S = 42.80 (J/K) V = 6.73 (cc) Cp = 25.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 45.28 | 6.74 | 28.50 | 8.85 | -1.50 | 4.79 | 7.36 |

clinopyroxene mass = 6.11 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.25Mg0.33Fe'"0.03Ti0.41Al0.78Si1.21O6
G = -88636.18 (J) H = -77264.64 (J) S = 11.22 (J/K) V = 1.71 (cc) Cp = 6.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.97 | 1.21 | 24.97 | 75.21 | 6.98 | -3.55 | 6.16 |

biotite mass = 4.74 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -75039.97 (J) H = -64795.03 (J) S = 10.11 (J/K) V = 1.71 (cc) Cp = 5.95 (J/K)

| annite | phlogopite |
|---|---|
| 3.32 | 96.68 |

feldspar mass = 28.26 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.70Ca0.26Al1.26Si2.74O8
G = -454940.82 (J) H = -395745.95 (J) S = 58.43 (J/K) V = 10.78 (cc) Cp = 34.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.32 | 25.57 | 4.11 |

quartz mass = 5.56 (gm) density = 2.55 (gm/cc)
SiO2
G = -89756.10 (J) H = -78774.95 (J) S = 10.84 (J/K) V = 2.18 (cc) Cp = 6.43 (J/K)

apatite mass = 0.26 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3707.82 (J) H = -3194.82 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.28 (J/K)

Total solids mass = 93.38 (gm) density = 3.14 (gm/cc)
G = -1388635.08 (J) H = -1204807.07 (J) S = 181.44 (J/K) V = 29.75 (cc) Cp = 106.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.06 (gm/cc)
G = -1493641.93 (J) H = -1290461.78 (J) S = 200.54 (J/K) V = 32.64 (cc) Cp = 116.05 (J/K)

Oxygen delta moles = -0.00437831 delta grams = -0.140101
G = 981.04 (J) H = -101.40 (J) S = -1.07 (J/K) V = -368.81 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 730.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.07 COH = 1.06
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 4.79 (gm) density = 2.19 (gm/cc) viscosity = 1.22 (log 10 poise) (analysis in wt %)
G = -77643.66 (J) H = -62574.02 (J) S = 15.02 (J/K) V = 2.19 (cc) Cp = 7.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 51.58 | 0.05 | 11.46 | 0.26 | 0.00 | 0.65 | 3.80 | 0.12 | 0.00 | 0.00 | 5.33 | 5.49 | 1.73 | 3.38 | 16.17 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.97 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.20Fe"0.58Mg0.21)3Al2Si3O12
G = -345618.82 (J) H = -298044.17 (J) S = 47.43 (J/K) V = 6.58 (cc) Cp = 27.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.48 | 20.31 | 21.22 |

clinopyroxene mass = 21.90 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.86Fe"0.29Mg0.62Fe'"0.03Ti0.04Al0.21Si1.88O6
G = -320941.61 (J) H = -279594.34 (J) S = 41.22 (J/K) V = 6.52 (cc) Cp = 24.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 45.86 | 6.16 | 28.51 | 8.75 | -1.63 | 4.86 | 7.48 |

clinopyroxene mass = 6.23 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.25Mg0.32Fe'"0.03Ti0.41Al0.78Si1.21O6
G = -90151.43 (J) H = -78750.97 (J) S = 11.36 (J/K) V = 1.74 (cc) Cp = 6.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.62 | 1.08 | 25.37 | 75.75 | 6.87 | -3.56 | 6.11 |

biotite mass = 5.41 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -85475.84 (J) H = -73967.06 (J) S = 11.47 (J/K) V = 1.96 (cc) Cp = 6.78 (J/K)

| annite | phlogopite |
|---|---|
| 3.49 | 96.51 |

feldspar mass = 28.85 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.70Ca0.26Al1.26Si2.74O8
G = -463827.51 (J) H = -404360.22 (J) S = 59.28 (J/K) V = 11.00 (cc) Cp = 35.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.41 | 25.67 | 3.92 |

quartz mass = 6.52 (gm) density = 2.55 (gm/cc)
SiO2
G = -105223.48 (J) H = -92536.70 (J) S = 12.65 (J/K) V = 2.55 (cc) Cp = 7.54 (J/K)

apatite mass = 0.19 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2737.23 (J) H = -2363.84 (J) S = 0.37 (J/K) V = 0.06 (cc) Cp = 0.21 (J/K)

Total solids mass = 95.07 (gm) density = 3.13 (gm/cc)
G = -1413975.93 (J) H = -1229617.31 (J) S = 183.78 (J/K) V = 30.41 (cc) Cp = 108.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.06 (gm/cc)
G = -1491619.59 (J) H = -1292191.33 (J) S = 198.80 (J/K) V = 32.60 (cc) Cp = 116.13 (J/K)

Oxygen delta moles = -0.0044276 delta grams = -0.141678
G = 981.29 (J) H = -101.00 (J) S = -1.08 (J/K) V = -369.28 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 720.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = -0.09 COH = 1.03 IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 3.84 (gm) density = 2.15 (gm/cc) viscosity = 0.32 (log 10 poise) (analysis in wt %)
G = -62333.60 (J) H = -49754.47 (J) S = 12.67 (J/K) V = 1.79 (cc) Cp = 6.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 44.12 | 0.03 | 10.35 | 0.26 | 0.00 | 0.61 | 4.73 | 0.10 | 0.00 | 0.00 | 7.57 | 5.90 | 1.25 | 5.36 | 19.72 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 26.16 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.21Fe"0.59Mg0.20)3Al2Si3O12
G = -347483.64 (J) H = -300343.76 (J) S = 47.47 (J/K) V = 6.63 (cc) Cp = 27.76 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.63 | 21.01 | 20.36 |

clinopyroxene mass = 21.42 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.87Fe"0.28Mg0.61Fe'"0.03Ti0.03Al0.21Si1.88O6
G = -313610.73 (J) H = -273832.91 (J) S = 40.05 (J/K) V = 6.37 (cc) Cp = 23.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 46.65 | 5.69 | 28.27 | 8.61 | -1.72 | 4.86 | 7.63 |

clinopyroxene mass = 6.31 (gm) density = 3.58 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.93Fe"0.26Mg0.31Fe'"0.03Ti0.42Al0.79Si1.21O6
G = -91170.31 (J) H = -79812.88 (J) S = 11.44 (J/K) V = 1.76 (cc) Cp = 6.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.09 | 0.97 | 25.55 | 76.29 | 6.81 | -3.64 | 6.12 |

biotite mass = 5.82 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.04Mg0.96)3AlSi3O10(OH)2
G = -91873.15 (J) H = -79681.01 (J) S = 12.28 (J/K) V = 2.10 (cc) Cp = 7.29 (J/K)

| annite | phlogopite |
|---|---|
| 3.53 | 96.47 |

feldspar mass = 29.14 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.71Ca0.26Al1.26Si2.74O8
G = -467941.60 (J) H = -408837.69 (J) S = 59.51 (J/K) V = 11.10 (cc) Cp = 36.70 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.76 | 25.59 | 3.65 |

quartz mass = 7.08 (gm) density = 2.55 (gm/cc)
SiO2
G = -113975.78 (J) H = -100435.66 (J) S = 13.63 (J/K) V = 2.77 (cc) Cp = 8.16 (J/K)

apatite mass = 0.09 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1223.67 (J) H = -1059.12 (J) S = 0.17 (J/K) V = 0.03 (cc) Cp = 0.09 (J/K)

Total solids mass = 96.01 (gm) density = 3.12 (gm/cc)
G = -1427278.89 (J) H = -1244003.03 (J) S = 184.54 (J/K) V = 30.77 (cc) Cp = 110.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.07 (gm/cc)
G = -1489612.49 (J) H = -1293757.50 (J) S = 197.21 (J/K) V = 32.56 (cc) Cp = 116.44 (J/K)

Oxygen delta moles = -0.00448008 delta grams = -0.143357
G = 982.01 (J) H = -100.63 (J) S = -1.09 (J/K) V = -369.94 (cc) Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 710.00 (C) P = 6.000 (kbars) log(10) f O2 = -16.00 delta HM = -5.22 NNO = 0.00 QFM = -0.10 COH = 0.99 IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid mass = 3.43 (gm) density = 2.13 (gm/cc) viscosity = -0.16 (log 10 poise) (analysis in wt %)
G = -55435.91 (J) H = -44089.62 (J) S = 11.54 (J/K) V = 1.61 (cc) Cp = 5.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 39.04 | 0.02 | 9.39 | 0.25 | 0.00 | 0.54 | 5.30 | 0.08 | 0.00 | 0.00 | 9.48 | 5.99 | 0.99 | 7.07 | 21.85 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 26.41 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.22Fe"0.59Mg0.20)3Al2Si3O12
G = -350072.69 (J) H = -303281.70 (J) S = 47.59 (J/K) V = 6.69 (cc) Cp = 27.96 (J/K)

almandine grossular pyrope
58.71 21.60 19.69

clinopyroxene mass = 21.05 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.87Fe"0.28Mg0.61Fe'"0.03Ti0.03Al0.21Si1.89O6
G = -308211.66 (J) H = -269745.13 (J) S = 39.13 (J/K) V = 6.27 (cc) Cp = 23.20 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
47.58 5.30 27.87 8.44 -1.79 4.82 7.78

clinopyroxene mass = 6.37 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.26Mg0.31Fe'"0.03Ti0.42Al0.79Si1.20O6
G = -91926.45 (J) H = -80650.84 (J) S = 11.47 (J/K) V = 1.78 (cc) Cp = 6.81 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-12.45 0.88 25.59 76.83 6.77 -3.76 6.15

biotite mass = 6.08 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -95827.58 (J) H = -83299.70 (J) S = 12.74 (J/K) V = 2.20 (cc) Cp = 7.61 (J/K)
annite phlogopite
3.48 96.52

feldspar mass = 29.17 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.03Na0.71Ca0.25Al1.25Si2.75O8
G = -467953.73 (J) H = -409740.26 (J) S = 59.21 (J/K) V = 11.11 (cc) Cp = 37.34 (J/K)
albite anorthite sanidine
71.24 25.39 3.36

quartz mass = 7.35 (gm) density = 2.59 (gm/cc)
SiO2
G = -118191.90 (J) H = -104522.35 (J) S = 13.90 (J/K) V = 2.84 (cc) Cp = 9.82 (J/K)

Total solids mass = 96.43 (gm) density = 3.12 (gm/cc)
G = -1432184.02 (J) H = -1251239.98 (J) S = 184.05 (J/K) V = 30.88 (cc) Cp = 112.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.07 (gm/cc)
G = -1487619.93 (J) H = -1295329.61 (J) S = 195.59 (J/K) V = 32.49 (cc) Cp = 118.27 (J/K)

Oxygen delta moles = -0.00453337 delta grams = -0.145062
G = 982.67 (J) H = -100.25 (J) S = -1.10 (J/K) V = -370.57 (cc) Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 700.00 (C) P = 6.000 (kbars) log(10) f O2 = -16.26 delta HM = -5.23 NNO = 0.00 QFM = -0.11 COH = 0.95 IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid mass = 3.14 (gm) density = 2.11 (gm/cc) viscosity = -0.43 (log 10 poise) (analysis in wt %)
G = -50791.82 (J) H = -40304.66 (J) S = 10.78 (J/K) V = 1.49 (cc) Cp = 5.16 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

36.20 0.01 8.84 0.23 0.00 0.48 5.78 0.07 0.00 0.00 10.16 6.16 0.82 7.71 23.54 0.00 0.00 0.00 0.00

garnet mass = 26.69 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.22Fe"0.59Mg0.19)3Al2Si3O12
G = -353227.38 (J) H = -306725.88 (J) S = 47.78 (J/K) V = 6.76 (cc) Cp = 28.20 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.73 | 22.18 | 19.09 |

clinopyroxene mass = 20.70 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.87Fe"0.27Mg0.62Fe'"0.03Ti0.03Al0.21Si1.89O6
G = -303075.12 (J) H = -265869.03 (J) S = 38.23 (J/K) V = 6.16 (cc) Cp = 22.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 48.55 | 4.93 | 27.39 | 8.26 | -1.87 | 4.78 | 7.95 |

clinopyroxene mass = 6.42 (gm) density = 3.59 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.93Fe"0.26Mg0.31Fe'"0.03Ti0.42Al0.80Si1.20O6
G = -92629.79 (J) H = -81445.90 (J) S = 11.49 (J/K) V = 1.79 (cc) Cp = 6.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -12.77 | 0.80 | 25.57 | 77.36 | 6.75 | -3.90 | 6.19 |

biotite mass = 6.29 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -99073.71 (J) H = -86318.10 (J) S = 13.11 (J/K) V = 2.27 (cc) Cp = 7.86 (J/K)

| annite | phlogopite |
|---|---|
| 3.39 | 96.61 |

feldspar mass = 29.06 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.72Ca0.25Al1.25Si2.75O8
G = -465647.46 (J) H = -408612.76 (J) S = 58.61 (J/K) V = 11.07 (cc) Cp = 37.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.78 | 25.15 | 3.07 |

quartz mass = 7.54 (gm) density = 2.59 (gm/cc)
SiO2
G = -121199.39 (J) H = -107408.18 (J) S = 14.17 (J/K) V = 2.91 (cc) Cp = 10.00 (J/K)

Total solids mass = 96.71 (gm) density = 3.12 (gm/cc)
G = -1434852.85 (J) H = -1256379.85 (J) S = 183.40 (J/K) V = 30.96 (cc) Cp = 113.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.85 (gm) density = 3.08 (gm/cc)
G = -1485644.67 (J) H = -1296684.50 (J) S = 194.17 (J/K) V = 32.45 (cc) Cp = 118.69 (J/K)

Oxygen delta moles = -0.00458452 delta grams = -0.146699
G = 982.63 (J) H = -99.79 (J) S = -1.11 (J/K) V = -370.94 (cc) Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.67 (gm/cc)  viscosity = 2.02 (log 10 poise)  (analysis in wt %)
G = -1627762.55 (J)  H = -1181510.21 (J)  S = 283.67 (J/K)  V = 37.49 (cc)  Cp = 148.86 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.69 | 0.00 | 8.38 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.02 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.67 (gm/cc)
G = -1627762.55 (J)  H = -1181510.21 (J)  S = 283.67 (J/K)  V = 37.49 (cc)  Cp = 148.86 (J/K)

Oxygen  delta moles = -1.49186e-16  delta grams = -4.77378e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: mafic

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.67 (gm/cc)  viscosity = 2.06 (log 10 poise)  (analysis in wt %)
G = -1624933.65 (J)  H = -1183001.29 (J)  S = 282.72 (J/K)  V = 37.46 (cc)  Cp = 148.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.69 | 0.00 | 8.38 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.06 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.67 (gm/cc)
G = -1624933.65 (J)  H = -1183001.29 (J)  S = 282.72 (J/K)  V = 37.46 (cc)  Cp = 148.85 (J/K)

Oxygen  delta moles = 5.51439e-06  delta grams = 0.000176454
G = -2.00 (J)  H = 0.24 (J)  S = 0.00 (J/K)  V = 0.72 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.67 (gm/cc)  viscosity = 2.10 (log 10 poise)  (analysis in wt %)
G = -1622114.64 (J)  H = -1184492.61 (J)  S = 281.76 (J/K)  V = 37.43 (cc)  Cp = 148.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.69 | 0.00 | 8.38 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.10 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.67 (gm/cc)
G = -1622114.64 (J)  H = -1184492.61 (J)  S = 281.76 (J/K)  V = 37.43 (cc)  Cp = 148.85 (J/K)

Oxygen  delta moles = 1.17261e-05  delta grams = 0.000375222
G = -4.22 (J)  H = 0.50 (J)  S = 0.00 (J/K)  V = 1.51 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.67 (gm/cc)  viscosity = 2.14 (log 10 poise)  (analysis in wt %)
G = -1619305.61 (J)  H = -1185984.20 (J)  S = 280.80 (J/K)  V = 37.39 (cc)  Cp = 148.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.70 | 0.00 | 8.37 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.14 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.67 (gm/cc)
G = -1619305.61 (J)  H = -1185984.20 (J)  S = 280.80 (J/K)  V = 37.39 (cc)  Cp = 148.84 (J/K)

Oxygen  delta moles = 1.86547e-05  delta grams = 0.000596928
G = -6.67 (J)  H = 0.79 (J)  S = 0.00 (J/K)  V = 2.39 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.68 (gm/cc)  viscosity = 2.19 (log 10 poise)  (analysis in wt %)
G = -1616506.62 (J)  H = -1187476.05 (J)  S = 279.84 (J/K)  V = 37.36 (cc)  Cp = 148.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.70 | 0.00 | 8.37 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.19 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.68 (gm/cc)
G = -1616506.62 (J)  H = -1187476.05 (J)  S = 279.84 (J/K)  V = 37.36 (cc)  Cp = 148.83 (J/K)

Oxygen  delta moles = 2.63204e-05  delta grams = 0.000842223
G = -9.34 (J)  H = 1.10 (J)  S = 0.01 (J/K)  V = 3.36 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.68 (gm/cc)  viscosity = 2.23 (log 10 poise)  (analysis in wt %)
G = -1613717.75 (J)  H = -1188968.19 (J)  S = 278.86 (J/K)  V = 37.33 (cc)  Cp = 148.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.70 | 0.00 | 8.37 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.23 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.68 (gm/cc)
G = -1613717.75 (J)  H = -1188968.19 (J)  S = 278.86 (J/K)  V = 37.33 (cc)  Cp = 148.82 (J/K)

Oxygen  delta moles = 3.47445e-05  delta grams = 0.00111178
G = -12.25 (J)  H = 1.44 (J)  S = 0.01 (J/K)  V = 4.40 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1240.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.24  COH = 2.19  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 98.43 (gm) density = 2.68 (gm/cc) viscosity = 2.29 (log 10 poise) (analysis in wt %)
G = -1585777.52 (J) H = -1171676.77 (J) S = 273.67 (J/K) V = 36.74 (cc) Cp = 146.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.07 | 1.17 | 16.07 | 1.70 | 0.00 | 8.38 | 0.18 | 5.51 | 0.00 | 0.00 | 9.80 | 2.94 | 0.90 | 0.25 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 1.57 (gm) density = 3.25 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.67Fe"0.22Mg0.94Fe'"0.05Ti0.01Al0.21Si1.87O6
G = -25162.09 (J) H = -19467.61 (J) S = 3.76 (J/K) V = 0.48 (cc) Cp = 1.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.54 | 30.98 | 22.44 | 7.97 | -6.29 | 11.36 | 2.01 |

Total solids mass = 1.57 (gm) density = 3.25 (gm/cc)
G = -25162.09 (J) H = -19467.61 (J) S = 3.76 (J/K) V = 0.48 (cc) Cp = 1.88 (J/K)

Viscosity of the System: 2.31 (log 10 poise)

System mass = 100.00 (gm) density = 2.69 (gm/cc)
G = -1610939.61 (J) H = -1191144.39 (J) S = 277.43 (J/K) V = 37.23 (cc) Cp = 148.23 (J/K)

Oxygen delta moles = 4.34371e-05 delta grams = 0.00138994
G = -15.20 (J) H = 1.78 (J) S = 0.01 (J/K) V = 5.46 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 94.38 (gm) density = 2.67 (gm/cc) viscosity = 2.37 (log 10 poise) (analysis in wt %)
G = -1518332.07 (J) H = -1124732.42 (J) S = 261.85 (J/K) V = 35.29 (cc) Cp = 139.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.14 | 1.21 | 16.53 | 1.70 | 0.00 | 8.41 | 0.19 | 5.04 | 0.00 | 0.00 | 9.47 | 3.05 | 0.94 | 0.26 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 5.62 (gm) density = 3.26 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.68Fe"0.23Mg0.91Fe'"0.05Ti0.01Al0.23Si1.86O6
G = -89857.12 (J) H = -69671.50 (J) S = 13.43 (J/K) V = 1.73 (cc) Cp = 6.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.49 | 29.34 | 22.87 | 8.64 | -6.66 | 12.13 | 2.19 |

Total solids mass = 5.62 (gm) density = 3.26 (gm/cc)
G = -89857.12 (J) H = -69671.50 (J) S = 13.43 (J/K) V = 1.73 (cc) Cp = 6.71 (J/K)

Viscosity of the System: 2.45 (log 10 poise)

System mass = 100.00 (gm) density = 2.70 (gm/cc)
G = -1608189.19 (J) H = -1194403.92 (J) S = 275.28 (J/K) V = 37.01 (cc) Cp = 146.70 (J/K)

Oxygen delta moles = 6.70859e-05 delta grams = 0.00214667
G = -23.30 (J) H = 2.73 (J) S = 0.02 (J/K) V = 8.38 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 90.61 (gm) density = 2.67 (gm/cc) viscosity = 2.45 (log 10 poise) (analysis in wt %)
G = -1456053.45 (J) H = -1081442.85 (J) S = 250.89 (J/K) V = 33.94 (cc) Cp = 134.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.24 | 1.24 | 16.96 | 1.68 | 0.00 | 8.42 | 0.20 | 4.61 | 0.00 | 0.00 | 9.12 | 3.16 | 0.98 | 0.27 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 9.39 (gm) density = 3.27 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.69Fe"0.24Mg0.88Fe'"0.06Ti0.01Al0.24Si1.85O6
G = -149416.57 (J) H = -116082.57 (J) S = 22.32 (J/K) V = 2.88 (cc) Cp = 11.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.61 | 28.37 | 23.52 | 9.29 | -7.00 | 12.84 | 2.36 |

Total solids mass = 9.39 (gm) density = 3.27 (gm/cc)
G = -149416.57 (J) H = -116082.57 (J) S = 22.32 (J/K) V = 2.88 (cc) Cp = 11.17 (J/K)

Viscosity of the System: 2.60 (log 10 poise)

System mass = 100.00 (gm) density = 2.72 (gm/cc)
G = -1605470.01 (J) H = -1197525.41 (J) S = 273.21 (J/K) V = 36.81 (cc) Cp = 145.28 (J/K)

Oxygen delta moles = 0.000109034 delta grams = 0.00348896
G = -37.59 (J) H = 4.40 (J) S = 0.03 (J/K) V = 13.54 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 87.11 (gm) density = 2.67 (gm/cc) viscosity = 2.54 (log 10 poise) (analysis in wt %)
G = -1398415.70 (J) H = -1041441.96 (J) S = 240.69 (J/K) V = 32.68 (cc) Cp = 128.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.38 | 1.26 | 17.37 | 1.67 | 0.00 | 8.40 | 0.21 | 4.22 | 0.00 | 0.00 | 8.77 | 3.27 | 1.02 | 0.28 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 12.90 (gm) density = 3.27 (gm/cc) (analysis in mole %)

cpx Na0.03Ca0.70Fe"0.24Mg0.86Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -204363.56 (J) H = -159075.42 (J) S = 30.54 (J/K) V = 3.94 (cc) Cp = 15.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.31 | 27.74 | 24.28 | 9.92 | -7.32 | 13.52 | 2.54 |

Total solids mass = 12.90 (gm) density = 3.27 (gm/cc)
G = -204363.56 (J) H = -159075.42 (J) S = 30.54 (J/K) V = 3.94 (cc) Cp = 15.29 (J/K)

Viscosity of the System: 2.75 (log 10 poise)

System mass = 100.01 (gm) density = 2.73 (gm/cc)
G = -1602779.26 (J) H = -1200517.39 (J) S = 271.22 (J/K) V = 36.62 (cc) Cp = 143.96 (J/K)

Oxygen delta moles = 0.000165733 delta grams = 0.00530327
G = -56.70 (J) H = 6.62 (J) S = 0.04 (J/K) V = 20.44 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1200.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.12 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 83.83 (gm) density = 2.66 (gm/cc) viscosity = 2.63 (log 10 poise) (analysis in wt %)
G = -1344919.62 (J) H = -1004351.97 (J) S = 231.18 (J/K) V = 31.52 (cc) Cp = 119.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.55 | 1.28 | 17.75 | 1.65 | 0.00 | 8.35 | 0.22 | 3.86 | 0.00 | 0.00 | 8.42 | 3.38 | 1.06 | 0.29 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 16.17 (gm) density = 3.28 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.70Fe"0.25Mg0.84Fe'"0.07Ti0.01Al0.27Si1.83O6
G = -255194.91 (J) H = -199014.06 (J) S = 38.14 (J/K) V = 4.93 (cc) Cp = 19.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.76 | 27.31 | 25.11 | 10.54 | -7.61 | 14.17 | 2.72 |

Total solids mass = 16.17 (gm) density = 3.28 (gm/cc)
G = -255194.91 (J) H = -199014.06 (J) S = 38.14 (J/K) V = 4.93 (cc) Cp = 19.12 (J/K)

Viscosity of the System: 2.90 (log 10 poise)

System mass = 100.01 (gm) density = 2.74 (gm/cc)
G = -1600114.54 (J) H = -1203366.02 (J) S = 269.32 (J/K) V = 36.45 (cc) Cp = 139.08 (J/K)

Oxygen delta moles = 0.000234366 delta grams = 0.00749943
G = -79.58 (J) H = 9.28 (J) S = 0.06 (J/K) V = 28.71 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 80.77 (gm) density = 2.65 (gm/cc) viscosity = 2.72 (log 10 poise) (analysis in wt %)
G = -1295125.08 (J) H = -969874.36 (J) S = 222.29 (J/K) V = 30.43 (cc) Cp = 115.30 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.75 | 1.30 | 18.11 | 1.63 | 0.00 | 8.27 | 0.22 | 3.52 | 0.00 | 0.00 | 8.07 | 3.49 | 1.10 | 0.30 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 19.24 (gm) density = 3.29 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.70Fe"0.26Mg0.82Fe'"0.07Ti0.02Al0.29Si1.82O6
G = -302348.44 (J) H = -236222.10 (J) S = 45.19 (J/K) V = 5.85 (cc) Cp = 22.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.03 | 27.03 | 25.98 | 11.15 | -7.88 | 14.77 | 2.91 |

Total solids mass = 19.24 (gm) density = 3.29 (gm/cc)
G = -302348.44 (J) H = -236222.10 (J) S = 45.19 (J/K) V = 5.85 (cc) Cp = 22.68 (J/K)

Viscosity of the System: 3.06 (log 10 poise)

System mass = 100.01 (gm) density = 2.76 (gm/cc)
G = -1597473.52 (J) H = -1206096.46 (J) S = 267.49 (J/K) V = 36.28 (cc) Cp = 137.99 (J/K)

Oxygen delta moles = 0.000312269 delta grams = 0.00999224
G = -105.23 (J) H = 12.25 (J) S = 0.08 (J/K) V = 37.99 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 77.89 (gm) density = 2.65 (gm/cc) viscosity = 2.81 (log 10 poise) (analysis in wt %)
G = -1248676.38 (J) H = -937767.55 (J) S = 213.96 (J/K) V = 29.41 (cc) Cp = 110.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.98 | 1.31 | 18.45 | 1.60 | 0.00 | 8.15 | 0.23 | 3.22 | 0.00 | 0.00 | 7.72 | 3.60 | 1.14 | 0.31 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 22.12 (gm) density = 3.30 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.70Fe"0.27Mg0.80Fe'"0.07Ti0.02Al0.30Si1.81O6
G = -346177.73 (J) H = -270961.56 (J) S = 51.76 (J/K) V = 6.71 (cc) Cp = 26.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.19 | 26.86 | 26.88 | 11.75 | -8.13 | 15.34 | 3.10 |

Total solids mass = 22.12 (gm) density = 3.30 (gm/cc)
G = -346177.73 (J) H = -270961.56 (J) S = 51.76 (J/K) V = 6.71 (cc) Cp = 26.01 (J/K)

Viscosity of the System: 3.21 (log 10 poise)

System mass = 100.01 (gm) density = 2.77 (gm/cc)
G = -1594854.10 (J) H = -1208729.12 (J) S = 265.72 (J/K) V = 36.12 (cc) Cp = 136.96 (J/K)

Oxygen delta moles = 0.000396794 delta grams = 0.0126969
G = -132.69 (J) H = 15.43 (J) S = 0.10 (J/K) V = 47.94 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 75.18 (gm) density = 2.64 (gm/cc) viscosity = 2.91 (log 10 poise) (analysis in wt %)
G = -1205276.52 (J) H = -907819.63 (J) S = 206.12 (J/K) V = 28.46 (cc) Cp = 106.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.23 | 1.31 | 18.77 | 1.57 | 0.00 | 8.01 | 0.24 | 2.94 | 0.00 | 0.00 | 7.39 | 3.70 | 1.18 | 0.32 | 1.34 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 24.84 (gm) density = 3.31 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.70Fe"0.28Mg0.78Fe'"0.08Ti0.02Al0.32Si1.80O6
G = -386977.75 (J) H = -303451.68 (J) S = 57.88 (J/K) V = 7.51 (cc) Cp = 29.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.28 | 26.78 | 27.80 | 12.33 | -8.37 | 15.88 | 3.30 |

Total solids mass = 24.84 (gm) density = 3.31 (gm/cc)
G = -386977.75 (J) H = -303451.68 (J) S = 57.88 (J/K) V = 7.51 (cc) Cp = 29.12 (J/K)

Viscosity of the System: 3.38 (log 10 poise)

System mass = 100.02 (gm) density = 2.78 (gm/cc)
G = -1592254.27 (J) H = -1211271.31 (J) S = 263.99 (J/K) V = 35.97 (cc) Cp = 136.00 (J/K)

Oxygen delta moles = 0.00048526 delta grams = 0.0155278
G = -161.03 (J) H = 18.69 (J) S = 0.12 (J/K) V = 58.23 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1160.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.05 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 72.63 (gm) density = 2.63 (gm/cc) viscosity = 3.01 (log 10 poise) (analysis in wt %)
G = -1164676.56 (J) H = -879852.57 (J) S = 198.74 (J/K) V = 27.57 (cc) Cp = 103.06 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.52 | 1.31 | 19.07 | 1.53 | 0.00 | 7.83 | 0.25 | 2.68 | 0.00 | 0.00 | 7.06 | 3.81 | 1.22 | 0.33 | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 27.39 (gm) density = 3.31 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.70Fe"0.29Mg0.76Fe'"0.08Ti0.02Al0.33Si1.79O6
G = -424995.49 (J) H = -333876.49 (J) S = 63.58 (J/K) V = 8.27 (cc) Cp = 32.03 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
20.32 26.75 28.72 12.90 -8.58 16.37 3.51

Total solids mass = 27.39 (gm) density = 3.31 (gm/cc)
G = -424995.49 (J) H = -333876.49 (J) S = 63.58 (J/K) V = 8.27 (cc) Cp = 32.03 (J/K)

Viscosity of the System: 3.54 (log 10 poise)

System mass = 100.02 (gm) density = 2.79 (gm/cc)
G = -1589672.04 (J) H = -1213729.06 (J) S = 262.32 (J/K) V = 35.83 (cc) Cp = 135.09 (J/K)

Oxygen delta moles = 0.00057498 delta grams = 0.0183987
G = -189.33 (J) H = 21.93 (J) S = 0.15 (J/K) V = 68.51 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1150.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.03 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 70.23 (gm) density = 2.63 (gm/cc) viscosity = 3.11 (log 10 poise) (analysis in wt %)
G = -1126666.27 (J) H = -853715.77 (J) S = 191.79 (J/K) V = 26.73 (cc) Cp = 99.48 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
53.83 1.30 19.36 1.49 0.00 7.63 0.26 2.44 0.00 0.00 6.74 3.91 1.26 0.34 1.44 0.00 0.00 0.00 0.00

clinopyroxene mass = 29.80 (gm) density = 3.32 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.69Fe"0.30Mg0.74Fe'"0.08Ti0.02Al0.34Si1.79O6
G = -460439.25 (J) H = -362391.63 (J) S = 68.89 (J/K) V = 8.97 (cc) Cp = 34.76 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
18.36 26.78 29.65 13.44 -8.78 16.83 3.72

Total solids mass = 29.80 (gm) density = 3.32 (gm/cc)
G = -460439.25 (J) H = -362391.63 (J) S = 68.89 (J/K) V = 8.97 (cc) Cp = 34.76 (J/K)

Viscosity of the System: 3.71 (log 10 poise)

System mass = 100.02 (gm) density = 2.80 (gm/cc)
G = -1587105.51 (J) H = -1216107.40 (J) S = 260.69 (J/K) V = 35.70 (cc) Cp = 134.24 (J/K)

Oxygen delta moles = 0.000663315 delta grams = 0.0212253
G = -216.72 (J) H = 25.06 (J) S = 0.17 (J/K) V = 78.49 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1140.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.18 COH = 2.01 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 67.09 (gm) density = 2.62 (gm/cc) viscosity = 3.19 (log 10 poise) (analysis in wt %)
G = -1076190.79 (J) H = -817646.45 (J) S = 182.96 (J/K) V = 25.60 (cc) Cp = 94.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.13 | 1.31 | 19.47 | 1.47 | 0.00 | 7.49 | 0.27 | 2.25 | 0.00 | 0.00 | 6.43 | 4.00 | 1.32 | 0.36 | 1.50 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 31.86 (gm) density = 3.33 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.69Fe"0.31Mg0.73Fe'"0.08Ti0.02Al0.35Si1.78O6
G = -490115.98 (J) H = -386387.90 (J) S = 73.40 (J/K) V = 9.57 (cc) Cp = 37.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.72 | 27.50 | 30.94 | 13.74 | -8.78 | 17.00 | 3.89 |

feldspar mass = 1.07 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.36Ca0.64Al1.64Si2.36O8
G = -18223.29 (J) H = -14564.61 (J) S = 2.59 (J/K) V = 0.40 (cc) Cp = 1.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.68 | 63.51 | 0.81 |

Total solids mass = 32.93 (gm) density = 3.30 (gm/cc)
G = -508339.27 (J) H = -400952.51 (J) S = 75.99 (J/K) V = 9.97 (cc) Cp = 38.40 (J/K)

Viscosity of the System: 3.91 (log 10 poise)

System mass = 100.02 (gm) density = 2.81 (gm/cc)
G = -1584530.06 (J) H = -1218598.95 (J) S = 258.95 (J/K) V = 35.57 (cc) Cp = 133.28 (J/K)

Oxygen delta moles = 0.000705491 delta grams = 0.0225749
G = -228.69 (J) H = 26.40 (J) S = 0.18 (J/K) V = 82.89 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 1130.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.17 COH = 1.99 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 63.04 (gm) density = 2.61 (gm/cc) viscosity = 3.25 (log 10 poise) (analysis in wt %)
G = -1010311.17 (J) H = -769304.35 (J) S = 171.76 (J/K) V = 24.12 (cc) Cp = 88.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.42 | 1.34 | 19.39 | 1.46 | 0.00 | 7.40 | 0.29 | 2.07 | 0.00 | 0.00 | 6.16 | 4.07 | 1.40 | 0.38 | 1.60 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 32.75 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.68Fe"0.32Mg0.72Fe'"0.08Ti0.03Al0.35Si1.78O6
G = -501411.11 (J) H = -395948.70 (J) S = 75.16 (J/K) V = 9.81 (cc) Cp = 38.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 13.37 | 28.13 | 32.26 | 13.85 | -8.51 | 16.89 | 4.02 |

clinopyroxene mass = 0.81 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.27Fe"0.55Mg0.99Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -11973.01 (J) H = -9337.73 (J) S = 1.88 (J/K) V = 0.24 (cc) Cp = 0.95 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-44.75 71.15 54.65 10.98 -9.03 15.15 1.85

feldspar mass = 3.43 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.37Ca0.62Al1.62Si2.38O8
G = -58244.41 (J) H = -46646.48 (J) S = 8.27 (J/K) V = 1.29 (cc) Cp = 4.20 (J/K)
albite anorthite sanidine
37.10 62.02 0.88

Total solids mass = 36.98 (gm) density = 3.26 (gm/cc)
G = -571628.53 (J) H = -451932.91 (J) S = 85.30 (J/K) V = 11.34 (cc) Cp = 43.19 (J/K)

Viscosity of the System: 4.14 (log 10 poise)

System mass = 100.02 (gm) density = 2.82 (gm/cc)
G = -1581939.70 (J) H = -1221237.26 (J) S = 257.07 (J/K) V = 35.46 (cc) Cp = 132.19 (J/K)

Oxygen delta moles = 0.00068685 delta grams = 0.0219784
G = -220.89 (J) H = 25.45 (J) S = 0.18 (J/K) V = 80.13 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 59.05 (gm) density = 2.60 (gm/cc) viscosity = 3.31 (log 10 poise) (analysis in wt %)
G = -945922.42 (J) H = -721898.04 (J) S = 160.80 (J/K) V = 22.67 (cc) Cp = 83.24 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
54.74 1.37 19.29 1.44 0.00 7.27 0.31 1.90 0.00 0.00 5.93 4.15 1.49 0.41 1.71 0.00 0.00 0.00 0.00

clinopyroxene mass = 31.96 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.69Fe"0.33Mg0.70Fe'"0.09Ti0.03Al0.35Si1.77O6
G = -487627.59 (J) H = -385909.13 (J) S = 73.01 (J/K) V = 9.56 (cc) Cp = 37.01 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
13.32 27.00 32.66 14.18 -8.17 16.81 4.20

clinopyroxene mass = 3.17 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.26Fe"0.57Mg0.97Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -46713.15 (J) H = -36485.81 (J) S = 7.34 (J/K) V = 0.94 (cc) Cp = 3.73 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-47.71 71.93 56.76 10.96 -8.93 15.13 1.87

feldspar mass = 5.84 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.38Ca0.61Al1.61Si2.39O8
G = -99098.34 (J) H = -79530.83 (J) S = 14.05 (J/K) V = 2.19 (cc) Cp = 7.15 (J/K)
albite anorthite sanidine
38.36 60.69 0.95

Total solids mass = 40.97 (gm) density = 3.23 (gm/cc)

G = -633439.09 (J)  H = -501925.78 (J)  S = 94.40 (J/K)  V = 12.69 (cc)  Cp = 47.89 (J/K)

Viscosity of the System: 4.41 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.83 (gm/cc)
G = -1579361.51 (J)  H = -1223823.81 (J)  S = 255.20 (J/K)  V = 35.36 (cc)  Cp = 131.13 (J/K)

Oxygen  delta moles = 0.000656046  delta grams = 0.0209927
G = -209.31 (J)  H = 24.07 (J)  S = 0.17 (J/K)  V = 75.99 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1110.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.16  COH = 1.95  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 55.38 (gm)  density = 2.60 (gm/cc)  viscosity = 3.37 (log 10 poise)  (analysis in wt %)
G = -886982.60 (J)  H = -678484.50 (J)  S = 150.74 (J/K)  V = 21.33 (cc)  Cp = 77.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.06 | 1.39 | 19.21 | 1.42 | 0.00 | 7.09 | 0.33 | 1.74 | 0.00 | 0.00 | 5.72 | 4.21 | 1.58 | 0.44 | 1.82 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 31.29 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.70Fe"0.33Mg0.68Fe'"0.09Ti0.03Al0.36Si1.77O6
G = -475830.60 (J)  H = -377415.94 (J)  S = 71.15 (J/K)  V = 9.34 (cc)  Cp = 36.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 13.32 | 25.87 | 32.98 | 14.55 | -7.80 | 16.70 | 4.39 |

clinopyroxene  mass = 5.28 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.25Fe"0.59Mg0.96Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -77482.87 (J)  H = -60612.03 (J)  S = 12.20 (J/K)  V = 1.56 (cc)  Cp = 6.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.59 | 72.71 | 58.82 | 10.92 | -8.85 | 15.10 | 1.88 |

feldspar  mass = 8.06 (gm)  density = 2.66 (gm/cc)  (analysis in mole %)
K0.01Na0.40Ca0.59Al1.59Si2.41O8
G = -136502.45 (J)  H = -109778.58 (J)  S = 19.32 (J/K)  V = 3.03 (cc)  Cp = 9.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 39.58 | 59.40 | 1.02 |

Total solids  mass = 44.64 (gm)  density = 3.20 (gm/cc)
G = -689815.91 (J)  H = -547806.55 (J)  S = 102.67 (J/K)  V = 13.93 (cc)  Cp = 52.20 (J/K)

Viscosity of the System: 4.72 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.84 (gm/cc)
G = -1576798.51 (J)  H = -1226291.05 (J)  S = 253.41 (J/K)  V = 35.26 (cc)  Cp = 130.16 (J/K)

Oxygen  delta moles = 0.000619591  delta grams = 0.0198262
G = -196.10 (J)  H = 22.51 (J)  S = 0.16 (J/K)  V = 71.25 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1100.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.93  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 52.00 (gm)  density = 2.59 (gm/cc)  viscosity = 3.43 (log 10 poise)  (analysis in wt %)
G = -832868.23 (J)  H = -638600.20 (J)  S = 141.48 (J/K)  V = 20.10 (cc)  Cp = 73.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.38 | 1.39 | 19.13 | 1.39 | 0.00 | 6.89 | 0.35 | 1.60 | 0.00 | 0.00 | 5.53 | 4.26 | 1.67 | 0.47 | 1.94 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 30.73 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.71Fe"0.33Mg0.67Fe'"0.09Ti0.04Al0.36Si1.76O6
G = -465696.40 (J)  H = -370220.90 (J)  S = 69.53 (J/K)  V = 9.16 (cc)  Cp = 35.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 13.37 | 24.74 | 33.22 | 14.96 | -7.41 | 16.55 | 4.57 |

clinopyroxene  mass = 7.19 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.25Fe"0.61Mg0.95Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -104803.19 (J)  H = -82114.56 (J)  S = 16.52 (J/K)  V = 2.12 (cc)  Cp = 8.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.36 | 73.48 | 60.82 | 10.89 | -8.77 | 15.05 | 1.88 |

feldspar  mass = 10.11 (gm)  density = 2.66 (gm/cc)  (analysis in mole %)
K0.01Na0.41Ca0.58Al1.58Si2.42O8
G = -170881.59 (J)  H = -137715.89 (J)  S = 24.15 (J/K)  V = 3.80 (cc)  Cp = 12.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.73 | 58.17 | 1.10 |

Total solids  mass = 48.02 (gm)  density = 3.19 (gm/cc)
G = -741381.19 (J)  H = -590051.36 (J)  S = 110.21 (J/K)  V = 15.07 (cc)  Cp = 56.14 (J/K)

Viscosity of the System: 5.11 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.84 (gm/cc)
G = -1574249.42 (J)  H = -1228651.55 (J)  S = 251.68 (J/K)  V = 35.17 (cc)  Cp = 129.26 (J/K)

Oxygen  delta moles = 0.000576295  delta grams = 0.0184407
G = -180.93 (J)  H = 20.73 (J)  S = 0.15 (J/K)  V = 65.79 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1090.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.93  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.91  IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid  mass = 48.87 (gm)  density = 2.58 (gm/cc)  viscosity = 3.48 (log 10 poise)  (analysis in wt %)
G = -783077.38 (J)  H = -601872.65 (J)  S = 132.93 (J/K)  V = 18.97 (cc)  Cp = 68.66 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
55.71 1.39 19.07 1.36 0.00 6.66 0.37 1.47 0.00 0.00 5.34 4.31 1.77 0.50 2.07 0.00 0.00 0.00 0.00

clinopyroxene mass = 30.24 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.72Fe"0.33Mg0.65Fe'"0.09Ti0.04Al0.37Si1.75O6
G = -456940.35 (J) H = -364104.69 (J) S = 68.10 (J/K) V = 8.99 (cc) Cp = 34.71 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
13.47 23.62 33.39 15.43 -7.02 16.36 4.74

clinopyroxene mass = 8.91 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.24Fe"0.63Mg0.94Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -129103.26 (J) H = -101321.57 (J) S = 20.38 (J/K) V = 2.62 (cc) Cp = 10.40 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-56.02 74.24 62.75 10.84 -8.69 14.99 1.89

feldspar mass = 12.00 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.42Ca0.57Al1.57Si2.43O8
G = -202592.06 (J) H = -163616.21 (J) S = 28.59 (J/K) V = 4.51 (cc) Cp = 14.65 (J/K)
albite anorthite sanidine
41.83 56.99 1.17

Total solids mass = 51.15 (gm) density = 3.17 (gm/cc)
G = -788635.67 (J) H = -629042.47 (J) S = 117.08 (J/K) V = 16.12 (cc) Cp = 59.77 (J/K)

Viscosity of the System: 5.66 (log 10 poise)

System mass = 100.02 (gm) density = 2.85 (gm/cc)
G = -1571713.06 (J) H = -1230915.12 (J) S = 250.01 (J/K) V = 35.09 (cc) Cp = 128.43 (J/K)

Oxygen delta moles = 0.00052507 delta grams = 0.0168016
G = -163.51 (J) H = 18.70 (J) S = 0.13 (J/K) V = 59.51 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1080.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.14 COH = 1.89 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 45.98 (gm) density = 2.57 (gm/cc) viscosity = 3.54 (log 10 poise) (analysis in wt %)
G = -737200.16 (J) H = -567998.61 (J) S = 125.04 (J/K) V = 17.91 (cc) Cp = 64.56 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
56.04 1.37 19.01 1.32 0.00 6.40 0.40 1.35 0.00 0.00 5.17 4.34 1.87 0.53 2.20 0.00 0.00 0.00 0.00

clinopyroxene mass = 29.82 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.73Fe"0.34Mg0.63Fe'"0.10Ti0.05Al0.37Si1.75O6
G = -449320.77 (J) H = -358880.17 (J) S = 66.84 (J/K) V = 8.85 (cc) Cp = 34.14 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
13.61 22.52 33.50 15.93 -6.61 16.14 4.91

clinopyroxene mass = 10.46 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.23Fe"0.65Mg0.92Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -150734.51 (J) H = -118501.73 (J) S = 23.82 (J/K) V = 3.06 (cc) Cp = 12.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.53 | 74.97 | 64.60 | 10.78 | -8.63 | 14.92 | 1.88 |

feldspar mass = 13.76 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.43Ca0.56Al1.56Si2.44O8
G = -231932.98 (J) H = -187708.99 (J) S = 32.68 (J/K) V = 5.18 (cc) Cp = 16.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 42.88 | 55.87 | 1.25 |

Total solids mass = 54.03 (gm) density = 3.16 (gm/cc)
G = -831988.27 (J) H = -665090.89 (J) S = 123.34 (J/K) V = 17.09 (cc) Cp = 63.11 (J/K)

Viscosity of the System: 6.80 (log 10 poise)

System mass = 100.01 (gm) density = 2.86 (gm/cc)
G = -1569188.43 (J) H = -1233089.50 (J) S = 248.38 (J/K) V = 35.01 (cc) Cp = 127.66 (J/K)

Oxygen delta moles = 0.000465026 delta grams = 0.0148803
G = -143.63 (J) H = 16.39 (J) S = 0.12 (J/K) V = 52.32 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1070.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.87 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 43.31 (gm) density = 2.56 (gm/cc) viscosity = 3.59 (log 10 poise) (analysis in wt %)
G = -694895.40 (J) H = -536726.83 (J) S = 117.76 (J/K) V = 16.94 (cc) Cp = 60.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.37 | 1.35 | 18.97 | 1.28 | 0.00 | 6.13 | 0.42 | 1.25 | 0.00 | 0.00 | 5.01 | 4.37 | 1.97 | 0.56 | 2.33 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 29.45 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.73Fe"0.34Mg0.62Fe'"0.10Ti0.05Al0.37Si1.74O6
G = -442639.50 (J) H = -354393.21 (J) S = 65.70 (J/K) V = 8.73 (cc) Cp = 33.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 13.78 | 21.45 | 33.55 | 16.47 | -6.20 | 15.88 | 5.07 |

clinopyroxene mass = 11.86 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.22Fe"0.66Mg0.92Fe'"0.06Ti0.01Al0.27Si1.83O6
G = -169985.31 (J) H = -133875.12 (J) S = 26.88 (J/K) V = 3.47 (cc) Cp = 13.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.88 | 75.67 | 66.37 | 10.72 | -8.57 | 14.82 | 1.88 |

feldspar mass = 15.39 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.44Ca0.55Al1.55Si2.45O8
G = -259154.54 (J) H = -210185.84 (J) S = 36.46 (J/K) V = 5.79 (cc) Cp = 18.76 (J/K)

albite anorthite sanidine
43.86 54.81 1.33

Total solids mass = 56.70 (gm) density = 3.15 (gm/cc)
G = -871779.34 (J) H = -698454.17 (J) S = 129.04 (J/K) V = 17.99 (cc) Cp = 66.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.86 (gm/cc)
G = -1566674.75 (J) H = -1235181.00 (J) S = 246.80 (J/K) V = 34.93 (cc) Cp = 126.95 (J/K)

Oxygen delta moles = 0.000395566 delta grams = 0.0126576
G = -121.17 (J) H = 13.80 (J) S = 0.10 (J/K) V = 44.17 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1060.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.84 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 40.84 (gm) density = 2.55 (gm/cc) viscosity = 3.64 (log 10 poise) (analysis in wt %)
G = -655871.83 (J) H = -507844.08 (J) S = 111.04 (J/K) V = 16.04 (cc) Cp = 57.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.70 | 1.31 | 18.93 | 1.23 | 0.00 | 5.85 | 0.44 | 1.15 | 0.00 | 0.00 | 4.86 | 4.38 | 2.07 | 0.59 | 2.47 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 29.13 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.74Fe"0.34Mg0.60Fe'"0.10Ti0.06Al0.38Si1.73O6
G = -436739.50 (J) H = -350521.13 (J) S = 64.67 (J/K) V = 8.62 (cc) Cp = 33.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 13.98 | 20.42 | 33.55 | 17.03 | -5.79 | 15.60 | 5.21 |

clinopyroxene mass = 13.12 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.22Fe"0.68Mg0.91Fe'"0.06Ti0.01Al0.27Si1.83O6
G = -187095.36 (J) H = -147624.14 (J) S = 29.61 (J/K) V = 3.83 (cc) Cp = 15.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.08 | 76.33 | 68.04 | 10.64 | -8.53 | 14.72 | 1.87 |

feldspar mass = 16.92 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.45Ca0.54Al1.54Si2.46O8
G = -284464.78 (J) H = -231205.69 (J) S = 39.95 (J/K) V = 6.37 (cc) Cp = 20.61 (J/K)

albite anorthite sanidine
44.78 53.80 1.42

Total solids mass = 59.17 (gm) density = 3.14 (gm/cc)
G = -908299.63 (J) H = -729350.97 (J) S = 134.23 (J/K) V = 18.82 (cc) Cp = 69.00 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.87 (gm/cc)
G = -1564171.47 (J) H = -1237195.05 (J) S = 245.27 (J/K) V = 34.86 (cc) Cp = 126.29 (J/K)

Oxygen delta moles = 0.000316462 delta grams = 0.0101264
G = -96.13 (J) H = 10.93 (J) S = 0.08 (J/K) V = 35.08 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1050.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.12 COH = 1.82 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 38.51 (gm) density = 2.54 (gm/cc) viscosity = 3.70 (log 10 poise) (analysis in wt %)
G = -619068.36 (J) H = -480532.55 (J) S = 104.70 (J/K) V = 15.19 (cc) Cp = 53.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.07 | 1.27 | 18.91 | 1.18 | 0.00 | 5.56 | 0.47 | 1.06 | 0.00 | 0.00 | 4.68 | 4.39 | 2.18 | 0.59 | 2.62 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 28.82 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.75Fe"0.34Mg0.59Fe'"0.10Ti0.06Al0.38Si1.72O6
G = -431258.67 (J) H = -346975.43 (J) S = 63.70 (J/K) V = 8.52 (cc) Cp = 32.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 14.20 | 19.42 | 33.50 | 17.63 | -5.39 | 15.29 | 5.35 |

clinopyroxene mass = 14.27 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.70Mg0.90Fe'"0.06Ti0.01Al0.27Si1.83O6
G = -202564.31 (J) H = -160136.55 (J) S = 32.07 (J/K) V = 4.16 (cc) Cp = 16.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.12 | 76.97 | 69.62 | 10.56 | -8.48 | 14.60 | 1.86 |

feldspar mass = 18.37 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.46Ca0.53Al1.53Si2.47O8
G = -308285.74 (J) H = -251102.76 (J) S = 43.22 (J/K) V = 6.92 (cc) Cp = 22.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.65 | 52.85 | 1.50 |

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -499.24 (J) H = -399.52 (J) S = 0.08 (J/K) V = 0.01 (cc) Cp = 0.04 (J/K)

Total solids mass = 61.50 (gm) density = 3.14 (gm/cc)
G = -942607.97 (J) H = -758614.26 (J) S = 139.06 (J/K) V = 19.61 (cc) Cp = 71.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.01 (gm) density = 2.87 (gm/cc)
G = -1561676.33 (J) H = -1239146.81 (J) S = 243.76 (J/K) V = 34.80 (cc) Cp = 125.64 (J/K)

Oxygen delta moles = 0.000224215 delta grams = 0.0071746
G = -67.54 (J) H = 7.66 (J) S = 0.06 (J/K) V = 24.67 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1040.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.11  COH = 1.80  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 36.34 (gm)  density = 2.52 (gm/cc)  viscosity = 3.75 (log 10 poise)  (analysis in wt %)
G = -584874.84 (J)  H = -455108.01 (J)  S = 98.82 (J/K)  V = 14.39 (cc)  Cp = 50.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.46 | 1.22 | 18.91 | 1.13 | 0.00 | 5.27 | 0.50 | 0.98 | 0.00 | 0.00 | 4.49 | 4.40 | 2.29 | 0.58 | 2.77 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 28.55 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.76Fe"0.33Mg0.58Fe'"0.10Ti0.07Al0.39Si1.72O6
G = -426286.59 (J)  H = -343828.71 (J)  S = 62.79 (J/K)  V = 8.43 (cc)  Cp = 32.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 14.44 | 18.48 | 33.43 | 18.23 | -5.00 | 14.96 | 5.47 |

clinopyroxene  mass = 15.31 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.71Mg0.89Fe'"0.06Ti0.01Al0.27Si1.84O6
G = -216322.35 (J)  H = -171352.10 (J)  S = 34.25 (J/K)  V = 4.45 (cc)  Cp = 17.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.00 | 77.56 | 71.10 | 10.47 | -8.45 | 14.46 | 1.85 |

feldspar  mass = 19.72 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.46Ca0.52Al1.52Si2.48O8
G = -330552.34 (J)  H = -269817.37 (J)  S = 46.25 (J/K)  V = 7.43 (cc)  Cp = 24.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 46.45 | 51.96 | 1.59 |

apatite  mass = 0.08 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1154.61 (J)  H = -926.27 (J)  S = 0.17 (J/K)  V = 0.03 (cc)  Cp = 0.09 (J/K)

Total solids  mass = 63.66 (gm)  density = 3.13 (gm/cc)
G = -974315.90 (J)  H = -785924.45 (J)  S = 143.47 (J/K)  V = 20.34 (cc)  Cp = 74.26 (J/K)

Viscosity of the System cannot be computed.

System  mass = 100.00 (gm)  density = 2.88 (gm/cc)
G = -1559190.74 (J)  H = -1241032.46 (J)  S = 242.29 (J/K)  V = 34.73 (cc)  Cp = 125.17 (J/K)

Oxygen  delta moles = 0.000121935  delta grams = 0.00390178
G = -36.42 (J)  H = 4.12 (J)  S = 0.03 (J/K)  V = 13.31 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1030.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.10  COH = 1.78  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 34.35 (gm) density = 2.51 (gm/cc) viscosity = 3.80 (log 10 poise) (analysis in wt %)
G = -553408.93 (J) H = -431677.07 (J) S = 93.41 (J/K) V = 13.66 (cc) Cp = 48.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.82 | 1.17 | 18.91 | 1.08 | 0.00 | 4.98 | 0.53 | 0.91 | 0.00 | 0.00 | 4.31 | 4.39 | 2.41 | 0.56 | 2.93 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 28.25 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.33Mg0.57Fe'"0.10Ti0.07Al0.39Si1.71O6
G = -421064.79 (J) H = -340464.77 (J) S = 61.85 (J/K) V = 8.33 (cc) Cp = 31.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 14.68 | 17.63 | 33.36 | 18.77 | -4.66 | 14.63 | 5.58 |

clinopyroxene mass = 16.24 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.72Mg0.88Fe'"0.06Ti0.01Al0.27Si1.84O6
G = -228366.02 (J) H = -181262.00 (J) S = 36.15 (J/K) V = 4.71 (cc) Cp = 18.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -68.71 | 78.11 | 72.49 | 10.37 | -8.41 | 14.32 | 1.83 |

clinopyroxene mass = 0.06 (gm) density = 3.51 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.90Fe"0.25Mg0.40Fe'"0.10Ti0.32Al0.69Si1.31O6
G = -854.94 (J) H = -695.29 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.36 | 6.14 | 24.67 | 58.86 | 4.91 | 5.50 | 4.28 |

feldspar mass = 20.99 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.47Ca0.51Al1.51Si2.49O8
G = -351299.81 (J) H = -287371.44 (J) S = 49.06 (J/K) V = 7.91 (cc) Cp = 25.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 47.19 | 51.12 | 1.68 |

apatite mass = 0.11 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1720.10 (J) H = -1383.32 (J) S = 0.26 (J/K) V = 0.04 (cc) Cp = 0.13 (J/K)

Total solids mass = 65.65 (gm) density = 3.12 (gm/cc)
G = -1003305.65 (J) H = -811176.83 (J) S = 147.43 (J/K) V = 21.01 (cc) Cp = 76.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.00 (gm) density = 2.88 (gm/cc)
G = -1556714.59 (J) H = -1242853.90 (J) S = 240.85 (J/K) V = 34.67 (cc) Cp = 124.62 (J/K)

Oxygen delta moles = 1.00476e-05 delta grams = 0.00032151
G = -2.98 (J) H = 0.34 (J) S = 0.00 (J/K) V = 1.09 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1020.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.10 COH = 1.76 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 32.55 (gm) density = 2.50 (gm/cc) viscosity = 3.86 (log 10 poise) (analysis in wt %)
G = -525172.67 (J) H = -410671.69 (J) S = 88.54 (J/K) V = 13.01 (cc) Cp = 45.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.30 | 1.09 | 18.82 | 1.02 | 0.00 | 4.66 | 0.56 | 0.84 | 0.00 | 0.00 | 4.15 | 4.39 | 2.52 | 0.55 | 3.09 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.53 (gm) density = 3.84 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.48Mg0.35)3Al2Si3O12
G = -7661.03 (J) H = -6191.58 (J) S = 1.14 (J/K) V = 0.14 (cc) Cp = 0.60 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 47.84 | 16.96 | 35.20 |

clinopyroxene mass = 27.43 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.34Mg0.57Fe'"0.10Ti0.07Al0.38Si1.72O6
G = -408061.69 (J) H = -330734.63 (J) S = 59.80 (J/K) V = 8.09 (cc) Cp = 31.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.07 | 17.46 | 33.70 | 18.31 | -4.64 | 14.42 | 5.69 |

clinopyroxene mass = 16.51 (gm) density = 3.45 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.74Mg0.88Fe'"0.06Ti0.01Al0.26Si1.84O6
G = -231246.40 (J) H = -183946.49 (J) S = 36.58 (J/K) V = 4.78 (cc) Cp = 18.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.91 | 78.50 | 73.69 | 10.15 | -8.32 | 14.06 | 1.83 |

clinopyroxene mass = 0.88 (gm) density = 3.51 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.90Fe"0.25Mg0.39Fe'"0.10Ti0.32Al0.69Si1.30O6
G = -13178.11 (J) H = -10743.55 (J) S = 1.88 (J/K) V = 0.25 (cc) Cp = 0.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.81 | 5.88 | 24.84 | 59.56 | 5.05 | 5.14 | 4.34 |

feldspar mass = 21.94 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.48Ca0.50Al1.50Si2.50O8
G = -366684.42 (J) H = -300593.96 (J) S = 51.11 (J/K) V = 8.28 (cc) Cp = 26.79 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.12 | 50.10 | 1.79 |

apatite mass = 0.15 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2207.42 (J) H = -1779.60 (J) S = 0.33 (J/K) V = 0.05 (cc) Cp = 0.17 (J/K)

Total solids mass = 67.44 (gm) density = 3.12 (gm/cc)
G = -1029039.08 (J) H = -833989.81 (J) S = 150.83 (J/K) V = 21.59 (cc) Cp = 78.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.99 (gm) density = 2.89 (gm/cc)
G = -1554211.75 (J) H = -1244661.50 (J) S = 239.38 (J/K) V = 34.59 (cc) Cp = 124.08 (J/K)

Oxygen delta moles = -0.000178152 delta grams = -0.00570066
G = 52.31 (J) H = -5.89 (J) S = -0.05 (J/K) V = -19.15 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: mafic

T = 1010.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -10.07  delta HM = -4.96  NNO = 0.00  QFM = 0.09  COH = 1.73
IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid  mass = 31.24 (gm)  density = 2.49 (gm/cc)  viscosity = 3.95 (log 10 poise)  (analysis in wt %)
G = -504878.40 (J)  H = -395898.65 (J)  S = 84.93 (J/K)  V = 12.55 (cc)  Cp = 43.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.11 | 1.03 | 18.50 | 0.95 | 0.00 | 4.26 | 0.58 | 0.78 | 0.00 | 0.00 | 3.97 | 4.43 | 2.61 | 0.54 | 3.22 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 3.22 (gm)  density = 3.84 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.48Mg0.35)3Al2Si3O12
G = -46238.65 (J)  H = -37451.80 (J)  S = 6.85 (J/K)  V = 0.84 (cc)  Cp = 3.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 48.31 | 16.90 | 34.79 |

clinopyroxene  mass = 27.61 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.34Mg0.57Fe'"0.09Ti0.07Al0.37Si1.73O6
G = -410341.30 (J)  H = -333428.67 (J)  S = 59.94 (J/K)  V = 8.14 (cc)  Cp = 31.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.04 | 17.23 | 33.82 | 17.70 | -4.37 | 13.76 | 5.83 |

clinopyroxene  mass = 14.63 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.74Mg0.88Fe'"0.05Ti0.01Al0.25Si1.85O6
G = -204407.87 (J)  H = -162990.98 (J)  S = 32.28 (J/K)  V = 4.24 (cc)  Cp = 16.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.35 | 78.92 | 74.48 | 9.71 | -7.98 | 13.41 | 1.82 |

clinopyroxene  mass = 1.33 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.90Fe"0.25Mg0.39Fe'"0.10Ti0.33Al0.69Si1.30O6
G = -19783.40 (J)  H = -16169.36 (J)  S = 2.82 (J/K)  V = 0.38 (cc)  Cp = 1.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.96 | 5.64 | 24.89 | 60.12 | 5.32 | 4.52 | 4.48 |

feldspar  mass = 21.78 (gm)  density = 2.65 (gm/cc)  (analysis in mole %)
K0.02Na0.50Ca0.48Al1.48Si2.52O8
G = -363442.96 (J)  H = -298525.36 (J)  S = 50.59 (J/K)  V = 8.22 (cc)  Cp = 26.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.99 | 48.08 | 1.93 |

apatite  mass = 0.17 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2555.37 (J)  H = -2065.18 (J)  S = 0.38 (J/K)  V = 0.06 (cc)  Cp = 0.20 (J/K)

Total solids  mass = 68.74 (gm)  density = 3.14 (gm/cc)
G = -1046769.56 (J)  H = -850631.35 (J)  S = 152.86 (J/K)  V = 21.88 (cc)  Cp = 79.86 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.98 (gm)  density = 2.90 (gm/cc)
G = -1551647.95 (J)  H = -1246529.99 (J)  S = 237.79 (J/K)  V = 34.43 (cc)  Cp = 123.51 (J/K)

Oxygen delta moles = -0.000508429 delta grams = -0.0162691
G = 148.01 (J) H = -16.64 (J) S = -0.13 (J/K) V = -54.24 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: mafic

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 30.08 (gm) density = 2.48 (gm/cc) viscosity = 4.04 (log 10 poise) (analysis in wt %)
G = -486688.26 (J) H = -382667.40 (J) S = 81.70 (J/K) V = 12.14 (cc) Cp = 41.96 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.88 | 0.98 | 18.15 | 0.89 | 0.00 | 3.92 | 0.60 | 0.72 | 0.00 | 0.00 | 3.81 | 4.47 | 2.69 | 0.54 | 3.34 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.82 (gm) density = 3.85 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.49Mg0.34)3Al2Si3O12
G = -83227.03 (J) H = -67556.60 (J) S = 12.31 (J/K) V = 1.51 (cc) Cp = 6.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 48.85 | 16.86 | 34.29 |

orthopyroxene mass = 1.55 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.77Mg1.06Fe'"0.03Ti0.00Al0.18Si1.89O6
G = -21628.24 (J) H = -17316.44 (J) S = 3.39 (J/K) V = 0.45 (cc) Cp = 1.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.17 | 94.40 | 77.42 | 7.57 | -6.83 | 10.19 | 0.42 |

clinopyroxene mass = 28.23 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.34Mg0.57Fe'"0.09Ti0.07Al0.36Si1.74O6
G = -419046.44 (J) H = -341346.50 (J) S = 61.03 (J/K) V = 8.33 (cc) Cp = 31.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.86 | 16.99 | 34.02 | 17.11 | -4.07 | 13.13 | 5.97 |

clinopyroxene mass = 10.84 (gm) density = 3.46 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.19Fe"0.75Mg0.88Fe'"0.05Ti0.01Al0.24Si1.86O6
G = -150887.35 (J) H = -120593.39 (J) S = 23.79 (J/K) V = 3.14 (cc) Cp = 12.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.03 | 79.33 | 75.46 | 9.28 | -7.65 | 12.80 | 1.81 |

clinopyroxene mass = 1.65 (gm) density = 3.52 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.90Fe"0.25Mg0.39Fe'"0.10Ti0.33Al0.69Si1.30O6
G = -24530.74 (J) H = -20098.90 (J) S = 3.48 (J/K) V = 0.47 (cc) Cp = 1.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.18 | 5.41 | 25.01 | 60.60 | 5.60 | 3.94 | 4.63 |

feldspar mass = 21.62 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.52Ca0.46Al1.46Si2.54O8
G = -360253.56 (J) H = -296492.90 (J) S = 50.08 (J/K) V = 8.17 (cc) Cp = 26.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 51.81 | 46.11 | 2.08 |

apatite mass = 0.19 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2853.22 (J) H = -2311.52 (J) S = 0.43 (J/K) V = 0.06 (cc) Cp = 0.22 (J/K)

Total solids mass = 69.89 (gm) density = 3.16 (gm/cc)
G = -1062426.58 (J) H = -865716.26 (J) S = 154.51 (J/K) V = 22.13 (cc) Cp = 81.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.92 (gm/cc)
G = -1549114.84 (J) H = -1248383.66 (J) S = 236.21 (J/K) V = 34.26 (cc) Cp = 123.01 (J/K)

Oxygen delta moles = -0.00081121 delta grams = -0.0259577
G = 234.11 (J) H = -26.25 (J) S = -0.20 (J/K) V = -85.87 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: mafic

T = 990.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.68 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 29.07 (gm) density = 2.47 (gm/cc) viscosity = 4.12 (log 10 poise) (analysis in wt %)
G = -470420.92 (J) H = -370817.21 (J) S = 78.85 (J/K) V = 11.77 (cc) Cp = 40.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.60 | 0.93 | 17.74 | 0.85 | 0.00 | 3.68 | 0.63 | 0.65 | 0.00 | 0.00 | 3.66 | 4.49 | 2.77 | 0.53 | 3.46 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.42 (gm) density = 3.85 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.50Mg0.33)3Al2Si3O12
G = -119894.73 (J) H = -97512.32 (J) S = 17.72 (J/K) V = 2.18 (cc) Cp = 9.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 49.78 | 16.93 | 33.29 |

orthopyroxene mass = 8.82 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.80Mg1.04Fe'''0.03Ti0.00Al0.18Si1.89O6
G = -122489.12 (J) H = -98241.97 (J) S = 19.20 (J/K) V = 2.54 (cc) Cp = 10.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.08 | 94.50 | 79.56 | 7.33 | -6.65 | 9.93 | 0.42 |

clinopyroxene mass = 30.22 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.77Fe"0.35Mg0.57Fe'''0.09Ti0.06Al0.35Si1.74O6
G = -447315.20 (J) H = -365182.01 (J) S = 65.02 (J/K) V = 8.91 (cc) Cp = 34.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 17.16 | 16.51 | 34.63 | 16.61 | -3.68 | 12.63 | 6.14 |

clinopyroxene mass = 1.70 (gm) density = 3.52 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.90Fe"0.26Mg0.38Fe'''0.09Ti0.33Al0.69Si1.30O6
G = -25227.27 (J) H = -20715.04 (J) S = 3.57 (J/K) V = 0.48 (cc) Cp = 1.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.65 | 5.17 | 25.56 | 60.72 | 5.91 | 3.50 | 4.79 |

feldspar mass = 21.53 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.02Na0.54Ca0.44Al1.44Si2.56O8
G = -358163.03 (J) H = -295362.83 (J) S = 49.72 (J/K) V = 8.15 (cc) Cp = 26.25 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 53.52 | 44.25 | 2.23 |

apatite mass = 0.21 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3117.69 (J) H = -2531.96 (J) S = 0.46 (J/K) V = 0.07 (cc) Cp = 0.24 (J/K)

Total solids mass = 70.90 (gm) density = 3.18 (gm/cc)
G = -1076207.04 (J) H = -879546.12 (J) S = 155.69 (J/K) V = 22.33 (cc) Cp = 82.13 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.93 (gm/cc)
G = -1546627.96 (J) H = -1250363.33 (J) S = 234.54 (J/K) V = 34.10 (cc) Cp = 122.60 (J/K)

Oxygen delta moles = -0.00105992 delta grams = -0.0339163
G = 303.22 (J) H = -33.92 (J) S = -0.27 (J/K) V = -111.32 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: mafic

T = 980.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.66 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 27.88 (gm) density = 2.46 (gm/cc) viscosity = 4.18 (log 10 poise) (analysis in wt %)
G = -451765.06 (J) H = -357026.31 (J) S = 75.60 (J/K) V = 11.34 (cc) Cp = 38.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.20 | 0.88 | 17.49 | 0.79 | 0.00 | 3.36 | 0.65 | 0.61 | 0.00 | 0.00 | 3.54 | 4.49 | 2.86 | 0.52 | 3.61 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.83 (gm) density = 3.86 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.50Mg0.33)3Al2Si3O12
G = -139637.53 (J) H = -113826.89 (J) S = 20.60 (J/K) V = 2.55 (cc) Cp = 10.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.13 | 16.98 | 32.89 |

orthopyroxene mass = 8.40 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.80Mg1.04Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -116485.15 (J) H = -93661.53 (J) S = 18.21 (J/K) V = 2.42 (cc) Cp = 9.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.21 | 94.57 | 80.02 | 7.10 | -6.47 | 9.57 | 0.42 |

clinopyroxene mass = 29.69 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.78Fe"0.34Mg0.57Fe'"0.09Ti0.06Al0.35Si1.75O6
G = -439318.14 (J) H = -359617.39 (J) S = 63.60 (J/K) V = 8.76 (cc) Cp = 33.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.55 | 15.96 | 34.38 | 16.24 | -3.48 | 12.10 | 6.25 |

clinopyroxene mass = 2.10 (gm) density = 3.52 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.90Fe"0.26Mg0.38Fe'"0.09Ti0.34Al0.69Si1.30O6
G = -31062.51 (J) H = -25571.72 (J) S = 4.38 (J/K) V = 0.59 (cc) Cp = 2.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.70 | 4.91 | 25.50 | 61.32 | 6.05 | 3.01 | 4.90 |

feldspar mass = 21.82 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.02Na0.55Ca0.43Al1.43Si2.57O8
G = -362512.38 (J) H = -299568.60 (J) S = 50.23 (J/K) V = 8.26 (cc) Cp = 26.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 54.76 | 42.86 | 2.38 |

apatite mass = 0.23 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3376.47 (J) H = -2748.79 (J) S = 0.50 (J/K) V = 0.07 (cc) Cp = 0.26 (J/K)

Total solids mass = 72.08 (gm) density = 3.18 (gm/cc)
G = -1092392.19 (J) H = -894994.94 (J) S = 157.52 (J/K) V = 22.65 (cc) Cp = 83.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.94 (gm/cc)
G = -1544157.25 (J) H = -1252021.25 (J) S = 233.12 (J/K) V = 33.99 (cc) Cp = 122.15 (J/K)

Oxygen delta moles = -0.00130657 delta grams = -0.0418087
G = 370.49 (J) H = -41.35 (J) S = -0.33 (J/K) V = -136.13 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: mafic

T = 970.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.06 COH = 1.64 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 26.79 (gm) density = 2.45 (gm/cc) viscosity = 4.24 (log 10 poise) (analysis in wt %)
G = -434546.17 (J) H = -344288.63 (J) S = 72.60 (J/K) V = 10.94 (cc) Cp = 37.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.78 | 0.83 | 17.24 | 0.73 | 0.00 | 3.06 | 0.68 | 0.57 | 0.00 | 0.00 | 3.42 | 4.48 | 2.95 | 0.52 | 3.75 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.15 (gm) density = 3.86 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.50Mg0.33)3Al2Si3O12
G = -157909.52 (J) H = -129014.49 (J) S = 23.24 (J/K) V = 2.89 (cc) Cp = 12.39 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.46 | 17.02 | 32.52 |

orthopyroxene mass = 8.00 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.80Mg1.04Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -110590.18 (J) H = -89147.72 (J) S = 17.25 (J/K) V = 2.30 (cc) Cp = 9.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.28 | 94.63 | 80.41 | 6.89 | -6.30 | 9.22 | 0.42 |

clinopyroxene mass = 29.22 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.78Fe"0.34Mg0.57Fe'"0.08Ti0.06Al0.34Si1.76O6
G = -432169.65 (J) H = -354716.84 (J) S = 62.30 (J/K) V = 8.62 (cc) Cp = 32.92 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.95 | 15.44 | 34.11 | 15.88 | -3.30 | 11.57 | 6.35 |

clinopyroxene mass = 2.45 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.90Fe"0.25Mg0.38Fe'"0.09Ti0.34Al0.69Si1.29O6
G = -36285.46 (J) H = -29947.79 (J) S = 5.10 (J/K) V = 0.70 (cc) Cp = 2.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.75 | 4.67 | 25.43 | 61.93 | 6.18 | 2.53 | 5.00 |

feldspar mass = 22.10 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.56Ca0.42Al1.42Si2.58O8
G = -366607.18 (J) H = -303581.91 (J) S = 50.70 (J/K) V = 8.37 (cc) Cp = 26.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.95 | 41.53 | 2.52 |

apatite mass = 0.24 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3599.11 (J) H = -2937.16 (J) S = 0.53 (J/K) V = 0.08 (cc) Cp = 0.28 (J/K)

Total solids mass = 73.16 (gm) density = 3.19 (gm/cc)
G = -1107161.08 (J) H = -909345.92 (J) S = 159.12 (J/K) V = 22.95 (cc) Cp = 84.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.95 (gm/cc)
G = -1541707.25 (J) H = -1253634.54 (J) S = 231.73 (J/K) V = 33.90 (cc) Cp = 121.74 (J/K)

Oxygen delta moles = -0.00154116 delta grams = -0.0493153
G = 433.14 (J) H = -48.22 (J) S = -0.39 (J/K) V = -159.29 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: mafic

T = 960.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.05 COH = 1.61 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 25.79 (gm) density = 2.44 (gm/cc) viscosity = 4.30 (log 10 poise) (analysis in wt %)
G = -418603.90 (J) H = -332487.54 (J) S = 69.83 (J/K) V = 10.57 (cc) Cp = 35.78 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.32 | 0.78 | 17.00 | 0.67 | 0.00 | 2.78 | 0.70 | 0.53 | 0.00 | 0.00 | 3.30 | 4.46 | 3.04 | 0.52 | 3.90 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.38 (gm) density = 3.87 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.32)3Al2Si3O12
G = -174879.68 (J) H = -143205.64 (J) S = 25.69 (J/K) V = 3.20 (cc) Cp = 13.74 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.76 | 17.06 | 32.17 |

orthopyroxene mass = 7.59 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.81Mg1.04Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -104809.80 (J) H = -84704.82 (J) S = 16.30 (J/K) V = 2.18 (cc) Cp = 8.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.29 | 94.70 | 80.73 | 6.68 | -6.13 | 8.88 | 0.42 |

clinopyroxene mass = 28.79 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.79Fe"0.34Mg0.57Fe'"0.08Ti0.06Al0.33Si1.77O6
G = -425775.98 (J) H = -350408.00 (J) S = 61.12 (J/K) V = 8.50 (cc) Cp = 32.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.36 | 14.94 | 33.82 | 15.51 | -3.14 | 11.06 | 6.45 |

clinopyroxene mass = 2.77 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.90Fe"0.25Mg0.38Fe'"0.08Ti0.34Al0.70Si1.29O6
G = -40966.96 (J) H = -33898.02 (J) S = 5.73 (J/K) V = 0.78 (cc) Cp = 3.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.80 | 4.44 | 25.33 | 62.56 | 6.30 | 2.07 | 5.11 |

feldspar mass = 22.37 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.57Ca0.40Al1.40Si2.60O8
G = -370450.82 (J) H = -307404.08 (J) S = 51.13 (J/K) V = 8.48 (cc) Cp = 27.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 57.09 | 40.24 | 2.67 |

apatite mass = 0.26 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3790.36 (J) H = -3100.73 (J) S = 0.56 (J/K) V = 0.08 (cc) Cp = 0.29 (J/K)

Total solids mass = 74.15 (gm) density = 3.19 (gm/cc)
G = -1120673.60 (J) H = -922721.29 (J) S = 160.53 (J/K) V = 23.23 (cc) Cp = 85.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.96 (gm/cc)
G = -1539277.50 (J) H = -1255208.83 (J) S = 230.36 (J/K) V = 33.80 (cc) Cp = 121.35 (J/K)

Oxygen delta moles = -0.00176402 delta grams = -0.0564466
G = 491.35 (J) H = -54.56 (J) S = -0.44 (J/K) V = -180.86 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: mafic

T = 950.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.04 COH = 1.58 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 24.86 (gm) density = 2.43 (gm/cc) viscosity = 4.35 (log 10 poise) (analysis in wt %)
G = -403799.10 (J) H = -321521.67 (J) S = 67.27 (J/K) V = 10.23 (cc) Cp = 34.46 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.83 | 0.74 | 16.75 | 0.62 | 0.00 | 2.53 | 0.73 | 0.50 | 0.00 | 0.00 | 3.20 | 4.43 | 3.12 | 0.52 | 4.04 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.53 (gm) density = 3.87 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.32)3Al2Si3O12
G = -190689.84 (J) H = -156509.68 (J) S = 27.94 (J/K) V = 3.50 (cc) Cp = 15.00 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.05 | 17.10 | 31.85 |

orthopyroxene mass = 7.20 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.81Mg1.05Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -99149.00 (J) H = -80336.83 (J) S = 15.38 (J/K) V = 2.07 (cc) Cp = 8.37 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.25 | 94.78 | 80.99 | 6.48 | -5.96 | 8.55 | 0.42 |

clinopyroxene mass = 28.41 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.79Fe"0.33Mg0.58Fe'"0.08Ti0.06Al0.32Si1.77O6
G = -420054.39 (J) H = -346626.85 (J) S = 60.03 (J/K) V = 8.39 (cc) Cp = 31.98 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.77 | 14.47 | 33.50 | 15.14 | -2.99 | 10.57 | 6.55 |

clinopyroxene mass = 3.06 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.91Fe"0.25Mg0.37Fe'"0.08Ti0.35Al0.70Si1.29O6
G = -45169.39 (J) H = -37470.69 (J) S = 6.29 (J/K) V = 0.87 (cc) Cp = 3.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.85 | 4.22 | 25.21 | 63.20 | 6.41 | 1.61 | 5.21 |

feldspar mass = 22.62 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.03Na0.58Ca0.39Al1.39Si2.61O8
G = -374051.77 (J) H = -311040.67 (J) S = 51.52 (J/K) V = 8.58 (cc) Cp = 27.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.17 | 39.01 | 2.82 |

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3954.07 (J) H = -3242.48 (J) S = 0.58 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 75.07 (gm) density = 3.20 (gm/cc)
G = -1133068.45 (J) H = -935227.19 (J) S = 161.75 (J/K) V = 23.49 (cc) Cp = 86.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.96 (gm/cc)
G = -1536867.55 (J) H = -1256748.87 (J) S = 229.01 (J/K) V = 33.72 (cc) Cp = 120.98 (J/K)

Oxygen delta moles = -0.00197553 delta grams = -0.0632144
G = 545.30 (J) H = -60.40 (J) S = -0.50 (J/K) V = -200.90 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: mafic

T = 940.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.03 COH = 1.56 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 24.00 (gm) density = 2.42 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -390010.89 (J) H = -311302.87 (J) S = 64.88 (J/K) V = 9.91 (cc) Cp = 33.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.31 | 0.70 | 16.50 | 0.57 | 0.00 | 2.29 | 0.76 | 0.47 | 0.00 | 0.00 | 3.10 | 4.40 | 3.20 | 0.52 | 4.18 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.61 (gm) density = 3.87 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.32)3Al2Si3O12
G = -205460.04 (J) H = -169019.00 (J) S = 30.04 (J/K) V = 3.77 (cc) Cp = 16.17 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.33 | 17.13 | 31.54 |

orthopyroxene mass = 6.81 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.81Mg1.05Fe'"0.02Ti0.00Al0.15Si1.91O6
G = -93611.78 (J) H = -76047.13 (J) S = 14.48 (J/K) V = 1.95 (cc) Cp = 7.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.18 | 94.85 | 81.20 | 6.29 | -5.80 | 8.23 | 0.41 |

clinopyroxene mass = 28.06 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.79Fe"0.33Mg0.58Fe'"0.07Ti0.06Al0.31Si1.78O6
G = -414931.91 (J) H = -343316.89 (J) S = 59.03 (J/K) V = 8.29 (cc) Cp = 31.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 24.18 | 14.02 | 33.15 | 14.78 | -2.86 | 10.08 | 6.64 |

clinopyroxene mass = 3.31 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.91Fe"0.25Mg0.37Fe'"0.08Ti0.35Al0.70Si1.28O6
G = -48947.52 (J) H = -40708.26 (J) S = 6.79 (J/K) V = 0.94 (cc) Cp = 3.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.91 | 4.01 | 25.08 | 63.85 | 6.51 | 1.16 | 5.31 |

feldspar mass = 22.86 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.59Ca0.38Al1.38Si2.62O8
G = -377421.45 (J) H = -314499.74 (J) S = 51.87 (J/K) V = 8.68 (cc) Cp = 27.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.21 | 37.82 | 2.97 |

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4093.38 (J) H = -3364.81 (J) S = 0.60 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 75.93 (gm) density = 3.20 (gm/cc)
G = -1144466.08 (J) H = -946955.84 (J) S = 162.81 (J/K) V = 23.73 (cc) Cp = 87.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 2.97 (gm/cc)
G = -1534476.96 (J) H = -1258258.71 (J) S = 227.69 (J/K) V = 33.63 (cc) Cp = 120.63 (J/K)

Oxygen delta moles = -0.00217608 delta grams = -0.0696321
G = 595.21 (J) H = -65.76 (J) S = -0.54 (J/K) V = -219.49 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: mafic

T = 930.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.36  delta HM = -5.02  NNO = 0.00  QFM = 0.02  COH = 1.53  IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid  mass = 23.20 (gm)  density = 2.42 (gm/cc)  viscosity = 4.44 (log 10 poise)  (analysis in wt %)
G = -377134.17 (J)  H = -301754.37 (J)  S = 62.65 (J/K)  V = 9.61 (cc)  Cp = 32.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.77 | 0.66 | 16.26 | 0.53 | 0.00 | 2.08 | 0.78 | 0.44 | 0.00 | 0.00 | 3.00 | 4.35 | 3.28 | 0.52 | 4.33 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 15.64 (gm)  density = 3.88 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.52Mg0.31)3Al2Si3O12
G = -219292.80 (J)  H = -180812.35 (J)  S = 31.98 (J/K)  V = 4.03 (cc)  Cp = 17.28 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.59 | 17.15 | 31.26 |

orthopyroxene  mass = 6.42 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.05Fe"0.81Mg1.05Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -88201.01 (J)  H = -71838.34 (J)  S = 13.60 (J/K)  V = 1.84 (cc)  Cp = 7.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.08 | 94.93 | 81.36 | 6.10 | -5.64 | 7.92 | 0.41 |

clinopyroxene  mass = 27.75 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.33Mg0.59Fe'"0.07Ti0.06Al0.31Si1.79O6
G = -410344.29 (J)  H = -340428.26 (J)  S = 58.11 (J/K)  V = 8.21 (cc)  Cp = 31.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.60 | 13.59 | 32.79 | 14.41 | -2.73 | 9.61 | 6.73 |

clinopyroxene  mass = 3.55 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.91Fe"0.25Mg0.37Fe'"0.07Ti0.36Al0.71Si1.28O6
G = -52349.42 (J)  H = -43648.04 (J)  S = 7.23 (J/K)  V = 1.00 (cc)  Cp = 3.90 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.97 | 3.81 | 24.93 | 64.50 | 6.59 | 0.73 | 5.41 |

feldspar  mass = 23.08 (gm)  density = 2.63 (gm/cc)  (analysis in mole %)
K0.03Na0.60Ca0.37Al1.37Si2.63O8
G = -380572.80 (J)  H = -317790.75 (J)  S = 52.18 (J/K)  V = 8.77 (cc)  Cp = 28.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.20 | 36.67 | 3.13 |

apatite  mass = 0.28 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4210.83 (J)  H = -3469.68 (J)  S = 0.62 (J/K)  V = 0.09 (cc)  Cp = 0.32 (J/K)

Total solids  mass = 76.72 (gm)  density = 3.20 (gm/cc)
G = -1154971.15 (J)  H = -957987.43 (J)  S = 163.72 (J/K)  V = 23.95 (cc)  Cp = 88.21 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.98 (gm/cc)
G = -1532105.32 (J)  H = -1259741.80 (J)  S = 226.38 (J/K)  V = 33.55 (cc)  Cp = 120.30 (J/K)

Oxygen delta moles = -0.00236613 delta grams = -0.0757133
G = 641.27 (J) H = -70.66 (J) S = -0.59 (J/K) V = -236.69 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: mafic

T = 920.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.02 COH = 1.50 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 22.46 (gm) density = 2.41 (gm/cc) viscosity = 4.49 (log 10 poise) (analysis in wt %)
G = -365077.41 (J) H = -292809.24 (J) S = 60.57 (J/K) V = 9.32 (cc) Cp = 31.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.20 | 0.62 | 16.02 | 0.48 | 0.00 | 1.88 | 0.81 | 0.41 | 0.00 | 0.00 | 2.91 | 4.30 | 3.36 | 0.53 | 4.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 16.60 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.52Mg0.31)3Al2Si3O12
G = -232276.34 (J) H = -191957.37 (J) S = 33.79 (J/K) V = 4.28 (cc) Cp = 18.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.84 | 17.17 | 30.98 |

orthopyroxene mass = 6.05 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.05Fe"0.81Mg1.05Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -82918.43 (J) H = -67712.27 (J) S = 12.74 (J/K) V = 1.74 (cc) Cp = 7.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.94 | 95.02 | 81.47 | 5.91 | -5.48 | 7.61 | 0.41 |

clinopyroxene mass = 27.47 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.32Mg0.59Fe'"0.07Ti0.06Al0.30Si1.79O6
G = -406235.00 (J) H = -337917.03 (J) S = 57.26 (J/K) V = 8.13 (cc) Cp = 30.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.01 | 13.17 | 32.41 | 14.05 | -2.60 | 9.15 | 6.81 |

clinopyroxene mass = 3.75 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.25Mg0.37Fe'"0.07Ti0.36Al0.71Si1.28O6
G = -55417.24 (J) H = -46322.80 (J) S = 7.62 (J/K) V = 1.06 (cc) Cp = 4.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.04 | 3.62 | 24.77 | 65.16 | 6.68 | 0.31 | 5.51 |

feldspar mass = 23.29 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.61Ca0.36Al1.36Si2.64O8
G = -383519.32 (J) H = -320923.72 (J) S = 52.46 (J/K) V = 8.85 (cc) Cp = 28.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.15 | 35.56 | 3.29 |

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4308.47 (J) H = -3558.65 (J) S = 0.63 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 77.46 (gm) density = 3.21 (gm/cc)

G = -1164674.80 (J)  H = -968391.85 (J)  S = 164.51 (J/K)  V = 24.16 (cc)  Cp = 88.96 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.98 (gm/cc)
G = -1529752.22 (J)  H = -1261201.09 (J)  S = 225.08 (J/K)  V = 33.48 (cc)  Cp = 119.99 (J/K)

Oxygen  delta moles = -0.00254611  delta grams = -0.0814723
G = 683.69 (J)  H = -75.12 (J)  S = -0.64 (J/K)  V = -252.58 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: mafic

T = 910.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -11.71  delta HM = -5.03  NNO = 0.00  QFM = 0.01  COH = 1.48  IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid  mass = 21.76 (gm)  density = 2.40 (gm/cc)  viscosity = 4.53 (log 10 poise)  (analysis in wt %)
G = -353760.76 (J)  H = -284409.03 (J)  S = 58.62 (J/K)  V = 9.06 (cc)  Cp = 30.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.61 | 0.59 | 15.79 | 0.44 | 0.00 | 1.71 | 0.83 | 0.39 | 0.00 | 0.00 | 2.83 | 4.25 | 3.43 | 0.53 | 4.61 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 17.51 (gm)  density = 3.88 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.52Mg0.31)3Al2Si3O12
G = -244487.17 (J)  H = -202512.60 (J)  S = 35.48 (J/K)  V = 4.51 (cc)  Cp = 19.30 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.09 | 17.19 | 30.72 |

orthopyroxene  mass = 5.68 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.06Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -77764.68 (J)  H = -63669.95 (J)  S = 11.91 (J/K)  V = 1.63 (cc)  Cp = 6.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.79 | 95.10 | 81.55 | 5.74 | -5.33 | 7.32 | 0.41 |

clinopyroxene  mass = 27.22 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.80Fe"0.32Mg0.60Fe'"0.06Ti0.06Al0.29Si1.80O6
G = -402554.30 (J)  H = -335744.52 (J)  S = 56.47 (J/K)  V = 8.06 (cc)  Cp = 30.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.43 | 12.77 | 32.00 | 13.70 | -2.49 | 8.70 | 6.89 |

clinopyroxene  mass = 3.94 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.25Mg0.37Fe'"0.07Ti0.36Al0.71Si1.28O6
G = -58187.92 (J)  H = -48761.31 (J)  S = 7.97 (J/K)  V = 1.12 (cc)  Cp = 4.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.10 | 3.44 | 24.60 | 65.81 | 6.75 | -0.10 | 5.60 |

feldspar  mass = 23.50 (gm)  density = 2.63 (gm/cc)  (analysis in mole %)
K0.03Na0.62Ca0.34Al1.34Si2.66O8
G = -386274.50 (J)  H = -323908.73 (J)  S = 52.71 (J/K)  V = 8.93 (cc)  Cp = 28.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.06 | 34.49 | 3.46 |

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4387.96 (J) H = -3632.97 (J) S = 0.64 (J/K) V = 0.10 (cc) Cp = 0.34 (J/K)

Total solids mass = 78.15 (gm) density = 3.21 (gm/cc)
G = -1173656.52 (J) H = -978230.09 (J) S = 165.17 (J/K) V = 24.35 (cc) Cp = 89.65 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.99 (gm/cc)
G = -1527417.28 (J) H = -1262639.12 (J) S = 223.79 (J/K) V = 33.41 (cc) Cp = 119.69 (J/K)

Oxygen delta moles = -0.00271645 delta grams = -0.0869233
G = 722.65 (J) H = -79.18 (J) S = -0.68 (J/K) V = -267.22 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: mafic

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 21.11 (gm) density = 2.40 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -343114.38 (J) H = -276502.61 (J) S = 56.78 (J/K) V = 8.81 (cc) Cp = 29.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.99 | 0.55 | 15.55 | 0.41 | 0.00 | 1.54 | 0.86 | 0.36 | 0.00 | 0.00 | 2.75 | 4.18 | 3.49 | 0.54 | 4.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 18.38 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.52Mg0.30)3Al2Si3O12
G = -255992.03 (J) H = -212529.06 (J) S = 37.05 (J/K) V = 4.73 (cc) Cp = 20.22 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.32 | 17.20 | 30.47 |

orthopyroxene mass = 5.32 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.06Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -72739.47 (J) H = -59711.69 (J) S = 11.10 (J/K) V = 1.53 (cc) Cp = 6.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.61 | 95.19 | 81.60 | 5.56 | -5.19 | 7.04 | 0.40 |

clinopyroxene mass = 26.99 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.32Mg0.60Fe'"0.06Ti0.05Al0.29Si1.81O6
G = -399258.45 (J) H = -333876.65 (J) S = 55.73 (J/K) V = 8.00 (cc) Cp = 30.34 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 29.84 | 12.38 | 31.58 | 13.34 | -2.38 | 8.27 | 6.96 |

clinopyroxene mass = 4.12 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.24Mg0.37Fe'"0.06Ti0.37Al0.72Si1.27O6
G = -60693.90 (J) H = -50988.85 (J) S = 8.27 (J/K) V = 1.16 (cc) Cp = 4.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.17 | 3.26 | 24.42 | 66.46 | 6.82 | -0.49 | 5.70 |

feldspar mass = 23.69 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.63Ca0.33Al1.33Si2.67O8
G = -388851.36 (J) H = -326755.62 (J) S = 52.93 (J/K) V = 9.01 (cc) Cp = 28.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.93 | 33.44 | 3.62 |

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4450.58 (J) H = -3693.60 (J) S = 0.65 (J/K) V = 0.10 (cc) Cp = 0.34 (J/K)

Total solids mass = 78.80 (gm) density = 3.21 (gm/cc)
G = -1181985.78 (J) H = -987555.47 (J) S = 165.73 (J/K) V = 24.53 (cc) Cp = 90.30 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 3.00 (gm/cc)
G = -1525100.16 (J) H = -1264058.08 (J) S = 222.51 (J/K) V = 33.34 (cc) Cp = 119.41 (J/K)

Oxygen delta moles = -0.00287762 delta grams = -0.0920802
G = 758.35 (J) H = -82.86 (J) S = -0.72 (J/K) V = -280.68 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: mafic

T = 890.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.01 COH = 1.42 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 20.50 (gm) density = 2.39 (gm/cc) viscosity = 4.60 (log 10 poise) (analysis in wt %)
G = -333077.11 (J) H = -269045.15 (J) S = 55.05 (J/K) V = 8.57 (cc) Cp = 28.23 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.36 | 0.52 | 15.32 | 0.37 | 0.00 | 1.39 | 0.89 | 0.34 | 0.00 | 0.00 | 2.68 | 4.11 | 3.56 | 0.55 | 4.90 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.20 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -266849.57 (J) H = -222051.48 (J) S = 38.51 (J/K) V = 4.94 (cc) Cp = 21.10 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.55 | 17.21 | 30.24 |

orthopyroxene mass = 4.97 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.06Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -67841.66 (J) H = -55837.15 (J) S = 10.32 (J/K) V = 1.42 (cc) Cp = 5.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.42 | 95.28 | 81.62 | 5.39 | -5.04 | 6.77 | 0.40 |

clinopyroxene mass = 26.79 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.31Mg0.61Fe'"0.06Ti0.05Al0.28Si1.81O6
G = -396308.96 (J) H = -332283.42 (J) S = 55.04 (J/K) V = 7.94 (cc) Cp = 30.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.24 | 12.00 | 31.15 | 13.00 | -2.27 | 7.85 | 7.03 |

clinopyroxene mass = 4.27 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.24Mg0.37Fe'''0.06Ti0.37Al0.72Si1.27O6
G = -62963.62 (J) H = -53027.63 (J) S = 8.54 (J/K) V = 1.21 (cc) Cp = 4.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.24 | 3.10 | 24.23 | 67.10 | 6.89 | -0.88 | 5.80 |

feldspar mass = 23.87 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.64Ca0.32Al1.32Si2.68O8
G = -391262.28 (J) H = -329473.74 (J) S = 53.12 (J/K) V = 9.08 (cc) Cp = 28.92 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.77 | 32.43 | 3.80 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4497.34 (J) H = -3741.29 (J) S = 0.65 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 79.41 (gm) density = 3.21 (gm/cc)
G = -1189723.43 (J) H = -996414.71 (J) S = 166.19 (J/K) V = 24.70 (cc) Cp = 90.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 3.00 (gm/cc)
G = -1522800.54 (J) H = -1265459.85 (J) S = 221.24 (J/K) V = 33.27 (cc) Cp = 119.13 (J/K)

Oxygen delta moles = -0.00303002 delta grams = -0.0969569
G = 790.96 (J) H = -86.17 (J) S = -0.75 (J/K) V = -293.03 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 880.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.02 COH = 1.39 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 19.92 (gm) density = 2.39 (gm/cc) viscosity = 4.63 (log 10 poise) (analysis in wt %)
G = -323595.23 (J) H = -261997.26 (J) S = 53.42 (J/K) V = 8.35 (cc) Cp = 27.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.71 | 0.49 | 15.09 | 0.34 | 0.00 | 1.26 | 0.91 | 0.33 | 0.00 | 0.00 | 2.61 | 4.04 | 3.62 | 0.56 | 5.04 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.98 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -277111.60 (J) H = -231119.32 (J) S = 39.88 (J/K) V = 5.14 (cc) Cp = 21.93 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.77 | 17.22 | 30.01 |

orthopyroxene mass = 4.62 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.07Fe'''0.02Ti0.00Al0.12Si1.93O6
G = -63069.41 (J) H = -52045.48 (J) S = 9.56 (J/K) V = 1.33 (cc) Cp = 5.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.21 | 95.38 | 81.61 | 5.23 | -4.90 | 6.50 | 0.40 |

clinopyroxene mass = 26.60 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.81Fe"0.31Mg0.61Fe'"0.05Ti0.05Al0.27Si1.82O6
G = -393671.93 (J) H = -330938.38 (J) S = 54.40 (J/K) V = 7.90 (cc) Cp = 29.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.65 | 11.64 | 30.69 | 12.65 | -2.17 | 7.44 | 7.10 |

clinopyroxene mass = 4.41 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.24Mg0.37Fe'"0.06Ti0.37Al0.72Si1.27O6
G = -65022.10 (J) H = -54897.20 (J) S = 8.78 (J/K) V = 1.25 (cc) Cp = 4.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.31 | 2.94 | 24.03 | 67.74 | 6.95 | -1.25 | 5.90 |

feldspar mass = 24.05 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.65Ca0.31Al1.31Si2.69O8
G = -393518.86 (J) H = -332071.91 (J) S = 53.29 (J/K) V = 9.15 (cc) Cp = 29.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.58 | 31.45 | 3.97 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4528.97 (J) H = -3776.54 (J) S = 0.65 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 79.98 (gm) density = 3.22 (gm/cc)
G = -1196922.87 (J) H = -1004848.83 (J) S = 166.56 (J/K) V = 24.86 (cc) Cp = 91.46 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 3.01 (gm/cc)
G = -1520518.09 (J) H = -1266846.08 (J) S = 219.98 (J/K) V = 33.21 (cc) Cp = 118.87 (J/K)

Oxygen delta moles = -0.00317408 delta grams = -0.101567
G = 820.68 (J) H = -89.14 (J) S = -0.79 (J/K) V = -304.32 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 19.37 (gm) density = 2.38 (gm/cc) viscosity = 4.66 (log 10 poise) (analysis in wt %)
G = -314621.47 (J) H = -255324.29 (J) S = 51.87 (J/K) V = 8.13 (cc) Cp = 26.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.04 | 0.47 | 14.87 | 0.31 | 0.00 | 1.13 | 0.94 | 0.31 | 0.00 | 0.00 | 2.55 | 3.96 | 3.67 | 0.57 | 5.18 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 20.73 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -286824.11 (J) H = -239767.58 (J) S = 41.16 (J/K) V = 5.33 (cc) Cp = 22.71 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.99 | 17.22 | 29.79 |

orthopyroxene mass = 4.29 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.07Fe'"0.01Ti0.00Al0.12Si1.93O6
G = -58420.30 (J) H = -48335.34 (J) S = 8.82 (J/K) V = 1.23 (cc) Cp = 4.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.99 | 95.47 | 81.57 | 5.07 | -4.76 | 6.25 | 0.39 |

clinopyroxene mass = 26.44 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.82Fe"0.30Mg0.62Fe'"0.05Ti0.05Al0.27Si1.83O6
G = -391317.51 (J) H = -329818.21 (J) S = 53.80 (J/K) V = 7.85 (cc) Cp = 29.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 34.04 | 11.28 | 30.22 | 12.32 | -2.07 | 7.05 | 7.16 |

clinopyroxene mass = 4.54 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.24Mg0.37Fe'"0.05Ti0.38Al0.73Si1.26O6
G = -66891.35 (J) H = -56614.80 (J) S = 8.99 (J/K) V = 1.28 (cc) Cp = 4.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.38 | 2.79 | 23.83 | 68.36 | 7.01 | -1.61 | 6.00 |

feldspar mass = 24.21 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.65Ca0.30Al1.30Si2.70O8
G = -395631.84 (J) H = -334558.30 (J) S = 53.43 (J/K) V = 9.22 (cc) Cp = 29.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.35 | 30.50 | 4.15 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4545.97 (J) H = -3799.68 (J) S = 0.65 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 80.52 (gm) density = 3.22 (gm/cc)
G = -1203631.08 (J) H = -1012893.92 (J) S = 166.85 (J/K) V = 25.01 (cc) Cp = 91.99 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 3.01 (gm/cc)
G = -1518252.55 (J) H = -1268218.21 (J) S = 218.72 (J/K) V = 33.15 (cc) Cp = 118.61 (J/K)

Oxygen delta moles = -0.0033102 delta grams = -0.105922
G = 847.65 (J) H = -91.79 (J) S = -0.82 (J/K) V = -314.62 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 18.86 (gm) density = 2.38 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -306114.18 (J) H = -248995.69 (J) S = 50.41 (J/K) V = 7.93 (cc) Cp = 25.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.35 | 0.44 | 14.65 | 0.28 | 0.00 | 1.02 | 0.96 | 0.29 | 0.00 | 0.00 | 2.49 | 3.88 | 3.73 | 0.59 | 5.32 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 21.44 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -296028.14 (J) H = -248027.44 (J) S = 42.36 (J/K) V = 5.50 (cc) Cp = 23.46 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.21 | 17.22 | 29.58 |

orthopyroxene mass = 3.96 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.82Mg1.08Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -53891.45 (J) H = -44705.04 (J) S = 8.11 (J/K) V = 1.14 (cc) Cp = 4.58 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.76 | 95.57 | 81.51 | 4.91 | -4.62 | 6.01 | 0.39 |

clinopyroxene mass = 26.29 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.82Fe"0.30Mg0.62Fe'"0.05Ti0.05Al0.26Si1.83O6
G = -389219.34 (J) H = -328902.32 (J) S = 53.23 (J/K) V = 7.81 (cc) Cp = 29.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.43 | 10.93 | 29.74 | 11.98 | -1.97 | 6.67 | 7.22 |

clinopyroxene mass = 4.66 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.24Mg0.37Fe'"0.05Ti0.38Al0.73Si1.26O6
G = -68590.77 (J) H = -58195.65 (J) S = 9.17 (J/K) V = 1.32 (cc) Cp = 5.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.45 | 2.65 | 23.62 | 68.98 | 7.07 | -1.97 | 6.10 |

feldspar mass = 24.37 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.66Ca0.30Al1.30Si2.70O8
G = -397611.16 (J) H = -336940.48 (J) S = 53.54 (J/K) V = 9.28 (cc) Cp = 29.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.10 | 29.57 | 4.33 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4548.62 (J) H = -3810.86 (J) S = 0.65 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 81.03 (gm) density = 3.22 (gm/cc)
G = -1209889.48 (J) H = -1020581.79 (J) S = 167.06 (J/K) V = 25.15 (cc) Cp = 92.48 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 3.02 (gm/cc)
G = -1516003.66 (J) H = -1269577.48 (J) S = 217.47 (J/K) V = 33.09 (cc) Cp = 118.37 (J/K)

Oxygen delta moles = -0.00343877 delta grams = -0.110037
G = 872.04 (J) H = -94.14 (J) S = -0.85 (J/K) V = -323.98 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 850.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.05 COH = 1.30
IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 18.37 (gm) density = 2.37 (gm/cc) viscosity = 4.72 (log 10 poise) (analysis in wt %)
G = -298036.52 (J) H = -242984.48 (J) S = 49.02 (J/K) V = 7.74 (cc) Cp = 25.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.65 | 0.42 | 14.43 | 0.26 | 0.00 | 0.92 | 0.99 | 0.28 | 0.00 | 0.00 | 2.44 | 3.79 | 3.77 | 0.60 | 5.46 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.12 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.29)3Al2Si3O12
G = -304760.45 (J) H = -255926.79 (J) S = 43.48 (J/K) V = 5.68 (cc) Cp = 24.17 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.42 | 17.21 | 29.37 |

orthopyroxene mass = 3.64 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.81Mg1.08Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -49479.63 (J) H = -41152.58 (J) S = 7.41 (J/K) V = 1.04 (cc) Cp = 4.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.52 | 95.67 | 81.43 | 4.76 | -4.49 | 5.77 | 0.38 |

clinopyroxene mass = 26.16 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.82Fe"0.29Mg0.63Fe'"0.04Ti0.05Al0.25Si1.84O6
G = -387354.16 (J) H = -328172.51 (J) S = 52.69 (J/K) V = 7.78 (cc) Cp = 29.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.81 | 10.59 | 29.24 | 11.66 | -1.87 | 6.30 | 7.28 |

clinopyroxene mass = 4.77 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.23Mg0.37Fe'"0.05Ti0.38Al0.73Si1.26O6
G = -70137.50 (J) H = -59653.20 (J) S = 9.33 (J/K) V = 1.34 (cc) Cp = 5.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.51 | 2.52 | 23.40 | 69.58 | 7.12 | -2.31 | 6.20 |

feldspar mass = 24.52 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.67Ca0.29Al1.29Si2.71O8
G = -399465.93 (J) H = -339225.42 (J) S = 53.64 (J/K) V = 9.35 (cc) Cp = 29.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.82 | 28.67 | 4.51 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4536.97 (J) H = -3810.03 (J) S = 0.65 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 81.51 (gm) density = 3.22 (gm/cc)
G = -1215734.64 (J) H = -1027940.54 (J) S = 167.20 (J/K) V = 25.29 (cc) Cp = 92.94 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 3.02 (gm/cc)
G = -1513771.16 (J) H = -1270925.02 (J) S = 216.22 (J/K) V = 33.03 (cc) Cp = 118.14 (J/K)

Oxygen delta moles = -0.00356016 delta grams = -0.113921
G = 894.00 (J) H = -96.20 (J) S = -0.88 (J/K) V = -332.46 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 840.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.04  delta HM = -5.09  NNO = 0.00  QFM = -0.06  COH = 1.27
IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid  mass = 17.91 (gm)  density = 2.37 (gm/cc)  viscosity = 4.75 (log 10 poise)  (analysis in wt %)
G = -290355.92 (J)  H = -237266.80 (J)  S = 47.69 (J/K)  V = 7.56 (cc)  Cp = 24.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.92 | 0.39 | 14.21 | 0.23 | 0.00 | 0.82 | 1.01 | 0.26 | 0.00 | 0.00 | 2.40 | 3.70 | 3.82 | 0.62 | 5.60 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 22.77 (gm)  density = 3.90 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.54Mg0.29)3Al2Si3O12
G = -313054.12 (J)  H = -263490.70 (J)  S = 44.53 (J/K)  V = 5.84 (cc)  Cp = 24.84 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.63 | 17.20 | 29.17 |

orthopyroxene  mass = 3.33 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.81Mg1.08Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -45181.33 (J)  H = -37675.74 (J)  S = 6.74 (J/K)  V = 0.95 (cc)  Cp = 3.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.28 | 95.77 | 81.33 | 4.61 | -4.36 | 5.54 | 0.38 |

clinopyroxene  mass = 26.04 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.82Fe"0.29Mg0.63Fe'"0.04Ti0.05Al0.25Si1.85O6
G = -385701.38 (J)  H = -327612.68 (J)  S = 52.18 (J/K)  V = 7.75 (cc)  Cp = 29.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.18 | 10.26 | 28.73 | 11.34 | -1.78 | 5.94 | 7.34 |

clinopyroxene  mass = 4.87 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.23Mg0.37Fe'"0.05Ti0.39Al0.74Si1.25O6
G = -71546.69 (J)  H = -60999.37 (J)  S = 9.48 (J/K)  V = 1.37 (cc)  Cp = 5.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.58 | 2.39 | 23.18 | 70.17 | 7.18 | -2.64 | 6.31 |

feldspar  mass = 24.66 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.68Ca0.28Al1.28Si2.72O8
G = -401204.53 (J)  H = -341419.52 (J)  S = 53.71 (J/K)  V = 9.40 (cc)  Cp = 29.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.51 | 27.79 | 4.70 |

apatite  mass = 0.31 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4510.87 (J)  H = -3797.00 (J)  S = 0.64 (J/K)  V = 0.10 (cc)  Cp = 0.35 (J/K)

Total solids  mass = 81.97 (gm)  density = 3.23 (gm/cc)
G = -1221198.93 (J)  H = -1034995.00 (J)  S = 167.28 (J/K)  V = 25.42 (cc)  Cp = 93.37 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.88 (gm)  density = 3.03 (gm/cc)
G = -1511554.84 (J)  H = -1272261.80 (J)  S = 214.97 (J/K)  V = 32.97 (cc)  Cp = 117.92 (J/K)

Oxygen delta moles = -0.00367473 delta grams = -0.117587
G = 913.68 (J) H = -98.00 (J) S = -0.91 (J/K) V = -340.10 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 830.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.07 COH = 1.24 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 17.47 (gm) density = 2.37 (gm/cc) viscosity = 4.77 (log 10 poise) (analysis in wt %)
G = -283043.50 (J) H = -231821.54 (J) S = 46.43 (J/K) V = 7.38 (cc) Cp = 23.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.19 | 0.37 | 14.00 | 0.21 | 0.00 | 0.74 | 1.04 | 0.25 | 0.00 | 0.00 | 2.36 | 3.60 | 3.86 | 0.64 | 5.75 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.40 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.54Mg0.29)3Al2Si3O12
G = -320938.97 (J) H = -270741.74 (J) S = 45.50 (J/K) V = 5.99 (cc) Cp = 25.48 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.84 | 17.18 | 28.98 |

orthopyroxene mass = 3.02 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.81Mg1.09Fe'"0.01Ti0.00Al0.10Si1.94O6
G = -40992.86 (J) H = -34272.11 (J) S = 6.09 (J/K) V = 0.87 (cc) Cp = 3.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.02 | 95.88 | 81.22 | 4.47 | -4.23 | 5.32 | 0.37 |

clinopyroxene mass = 25.93 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.28Mg0.64Fe'"0.04Ti0.05Al0.24Si1.85O6
G = -384242.76 (J) H = -327208.55 (J) S = 51.70 (J/K) V = 7.72 (cc) Cp = 29.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 39.54 | 9.93 | 28.21 | 11.02 | -1.69 | 5.60 | 7.39 |

clinopyroxene mass = 4.95 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.91Fe"0.23Mg0.37Fe'"0.04Ti0.39Al0.74Si1.25O6
G = -72831.79 (J) H = -62244.75 (J) S = 9.60 (J/K) V = 1.40 (cc) Cp = 5.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.65 | 2.26 | 22.95 | 70.75 | 7.23 | -2.96 | 6.41 |

feldspar mass = 24.80 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.68Ca0.27Al1.27Si2.73O8
G = -402834.67 (J) H = -343528.69 (J) S = 53.76 (J/K) V = 9.46 (cc) Cp = 29.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.17 | 26.94 | 4.89 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4469.96 (J) H = -3771.35 (J) S = 0.63 (J/K) V = 0.10 (cc) Cp = 0.34 (J/K)

Total solids mass = 82.41 (gm) density = 3.23 (gm/cc)

G = -1226311.01 (J)  H = -1041767.19 (J)  S = 167.29 (J/K)  V = 25.54 (cc)  Cp = 93.79 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.88 (gm)  density = 3.03 (gm/cc)
G = -1509354.51 (J)  H = -1273588.73 (J)  S = 213.72 (J/K)  V = 32.92 (cc)  Cp = 117.70 (J/K)

Oxygen  delta moles = -0.00378282  delta grams = -0.121046
G = 931.20 (J)  H = -99.55 (J)  S = -0.93 (J/K)  V = -346.96 (cc)  Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 820.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = -0.08  COH = 1.21  IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 17.05 (gm)  density = 2.36 (gm/cc)  viscosity = 4.80 (log 10 poise)  (analysis in wt %)
G = -276073.63 (J)  H = -226629.98 (J)  S = 45.23 (J/K)  V = 7.21 (cc)  Cp = 23.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.44 | 0.35 | 13.78 | 0.19 | 0.00 | 0.66 | 1.07 | 0.24 | 0.00 | 0.00 | 2.32 | 3.50 | 3.90 | 0.67 | 5.89 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 24.00 (gm)  density = 3.91 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.54Mg0.29)3Al2Si3O12
G = -328441.99 (J)  H = -277700.32 (J)  S = 46.42 (J/K)  V = 6.14 (cc)  Cp = 26.10 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.04 | 17.17 | 28.79 |

orthopyroxene  mass = 2.72 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.81Mg1.09Fe'"0.01Ti0.00Al0.10Si1.95O6
G = -36910.43 (J)  H = -30939.19 (J)  S = 5.46 (J/K)  V = 0.78 (cc)  Cp = 3.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.76 | 95.98 | 81.09 | 4.33 | -4.11 | 5.11 | 0.37 |

clinopyroxene  mass = 25.83 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.28Mg0.65Fe'"0.04Ti0.05Al0.23Si1.86O6
G = -382962.11 (J)  H = -326947.44 (J)  S = 51.24 (J/K)  V = 7.70 (cc)  Cp = 28.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.89 | 9.61 | 27.68 | 10.71 | -1.60 | 5.27 | 7.44 |

clinopyroxene  mass = 5.04 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.23Mg0.37Fe'"0.04Ti0.39Al0.75Si1.25O6
G = -74004.75 (J)  H = -63398.77 (J)  S = 9.70 (J/K)  V = 1.42 (cc)  Cp = 5.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.72 | 2.15 | 22.73 | 71.31 | 7.29 | -3.27 | 6.51 |

feldspar  mass = 24.93 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.69Ca0.26Al1.26Si2.74O8
G = -404363.44 (J)  H = -345558.38 (J)  S = 53.79 (J/K)  V = 9.51 (cc)  Cp = 30.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.81 | 26.10 | 5.09 |

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4413.64 (J) H = -3732.50 (J) S = 0.62 (J/K) V = 0.10 (cc) Cp = 0.34 (J/K)

Total solids mass = 82.82 (gm) density = 3.23 (gm/cc)
G = -1231096.35 (J) H = -1048276.60 (J) S = 167.24 (J/K) V = 25.65 (cc) Cp = 94.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.04 (gm/cc)
G = -1507169.98 (J) H = -1274906.59 (J) S = 212.47 (J/K) V = 32.87 (cc) Cp = 117.50 (J/K)

Oxygen delta moles = -0.00388475 delta grams = -0.124307
G = 946.71 (J) H = -100.86 (J) S = -0.96 (J/K) V = -353.08 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 810.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.09 COH = 1.18 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 16.66 (gm) density = 2.36 (gm/cc) viscosity = 4.82 (log 10 poise) (analysis in wt %)
G = -269423.55 (J) H = -221675.56 (J) S = 44.08 (J/K) V = 7.05 (cc) Cp = 22.75 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.67 | 0.33 | 13.57 | 0.18 | 0.00 | 0.59 | 1.09 | 0.22 | 0.00 | 0.00 | 2.29 | 3.40 | 3.93 | 0.69 | 6.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.57 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.54Mg0.29)3Al2Si3O12
G = -335587.64 (J) H = -284384.91 (J) S = 47.27 (J/K) V = 6.29 (cc) Cp = 26.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.25 | 17.14 | 28.61 |

orthopyroxene mass = 2.43 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.81Mg1.10Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -32930.17 (J) H = -27674.40 (J) S = 4.85 (J/K) V = 0.70 (cc) Cp = 2.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.50 | 96.08 | 80.94 | 4.19 | -3.99 | 4.91 | 0.36 |

clinopyroxene mass = 25.75 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.83Fe"0.27Mg0.65Fe'"0.03Ti0.04Al0.23Si1.86O6
G = -381845.00 (J) H = -326818.06 (J) S = 50.80 (J/K) V = 7.68 (cc) Cp = 28.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 42.23 | 9.30 | 27.13 | 10.41 | -1.51 | 4.95 | 7.49 |

clinopyroxene mass = 5.11 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.22Mg0.37Fe'"0.04Ti0.40Al0.75Si1.24O6
G = -75076.22 (J) H = -64469.86 (J) S = 9.79 (J/K) V = 1.44 (cc) Cp = 5.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.78 | 2.04 | 22.49 | 71.87 | 7.34 | -3.57 | 6.61 |

feldspar mass = 25.05 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.69Ca0.25Al1.25Si2.75O8
G = -405797.44 (J) H = -347513.68 (J) S = 53.81 (J/K) V = 9.56 (cc) Cp = 30.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.42 | 25.29 | 5.29 |

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4341.06 (J) H = -3679.65 (J) S = 0.61 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 83.22 (gm) density = 3.23 (gm/cc)
G = -1235577.52 (J) H = -1054540.56 (J) S = 167.14 (J/K) V = 25.76 (cc) Cp = 94.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.04 (gm/cc)
G = -1505001.07 (J) H = -1276216.13 (J) S = 211.22 (J/K) V = 32.82 (cc) Cp = 117.31 (J/K)

Oxygen delta moles = -0.00398084 delta grams = -0.127382
G = 960.31 (J) H = -101.95 (J) S = -0.98 (J/K) V = -358.50 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 15.91 (gm) density = 2.36 (gm/cc) viscosity = 4.74 (log 10 poise) (analysis in wt %)
G = -257124.34 (J) H = -211851.96 (J) S = 42.19 (J/K) V = 6.75 (cc) Cp = 21.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.44 | 0.30 | 13.46 | 0.16 | 0.00 | 0.54 | 1.14 | 0.21 | 0.00 | 0.00 | 2.27 | 3.42 | 4.00 | 0.74 | 6.31 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.49 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.54Mg0.29)3Al2Si3O12
G = -347625.85 (J) H = -295266.31 (J) S = 48.79 (J/K) V = 6.52 (cc) Cp = 27.65 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.33 | 17.08 | 28.59 |

orthopyroxene mass = 1.86 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.03Fe"0.80Mg1.11Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -25249.60 (J) H = -21277.51 (J) S = 3.70 (J/K) V = 0.53 (cc) Cp = 2.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.80 | 96.18 | 80.36 | 4.06 | -3.86 | 4.71 | 0.36 |

clinopyroxene mass = 25.76 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.83Fe"0.26Mg0.66Fe'"0.03Ti0.04Al0.22Si1.87O6
G = -382227.48 (J) H = -327981.41 (J) S = 50.55 (J/K) V = 7.69 (cc) Cp = 28.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 43.65 | 8.99 | 26.39 | 10.11 | -1.42 | 4.67 | 7.62 |

clinopyroxene mass = 5.19 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.22Mg0.37Fe'"0.04Ti0.40Al0.75Si1.24O6
G = -76195.29 (J) H = -65587.20 (J) S = 9.89 (J/K) V = 1.46 (cc) Cp = 5.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.73 | 1.93 | 22.12 | 72.35 | 7.44 | -3.89 | 6.77 |

feldspar mass = 25.00 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.70Ca0.24Al1.24Si2.76O8
G = -404227.67 (J) H = -346881.99 (J) S = 53.44 (J/K) V = 9.55 (cc) Cp = 30.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.10 | 24.20 | 5.70 |

quartz mass = 0.36 (gm) density = 2.56 (gm/cc)
SiO2
G = -5921.62 (J) H = -5131.86 (J) S = 0.74 (J/K) V = 0.14 (cc) Cp = 0.43 (J/K)

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4281.58 (J) H = -3637.64 (J) S = 0.60 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 83.96 (gm) density = 3.23 (gm/cc)
G = -1245729.09 (J) H = -1065763.91 (J) S = 167.70 (J/K) V = 25.99 (cc) Cp = 95.33 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.05 (gm/cc)
G = -1502853.43 (J) H = -1277615.88 (J) S = 209.88 (J/K) V = 32.74 (cc) Cp = 117.09 (J/K)

Oxygen delta moles = -0.00406094 delta grams = -0.129945
G = 969.63 (J) H = -102.58 (J) S = -1.00 (J/K) V = -362.34 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 790.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.11 COH = 1.11 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 15.04 (gm) density = 2.35 (gm/cc) viscosity = 4.61 (log 10 poise) (analysis in wt %)
G = -242930.42 (J) H = -200353.15 (J) S = 40.05 (J/K) V = 6.40 (cc) Cp = 20.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.99 | 0.27 | 13.39 | 0.15 | 0.00 | 0.49 | 1.21 | 0.21 | 0.00 | 0.00 | 2.26 | 3.48 | 4.08 | 0.79 | 6.67 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 26.50 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.54Mg0.29)3Al2Si3O12
G = -360757.17 (J) H = -307129.80 (J) S = 50.44 (J/K) V = 6.77 (cc) Cp = 28.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.37 | 17.00 | 28.64 |

orthopyroxene mass = 1.23 (gm) density = 3.49 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.03Fe"0.80Mg1.12Fe'"0.01Ti0.00Al0.09Si1.95O6
G = -16619.92 (J) H = -14044.05 (J) S = 2.42 (J/K) V = 0.35 (cc) Cp = 1.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.96 | 96.27 | 79.62 | 3.93 | -3.74 | 4.53 | 0.36 |

clinopyroxene mass = 25.80 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.26Mg0.67Fe'"0.03Ti0.04Al0.22Si1.87O6
G = -383159.84 (J) H = -329619.97 (J) S = 50.36 (J/K) V = 7.71 (cc) Cp = 28.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 45.07 | 8.68 | 25.59 | 9.82 | -1.33 | 4.41 | 7.78 |

clinopyroxene mass = 5.26 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.22Mg0.37Fe'"0.03Ti0.40Al0.76Si1.24O6
G = -77252.91 (J) H = -66655.97 (J) S = 9.97 (J/K) V = 1.48 (cc) Cp = 5.72 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.64 | 1.84 | 21.71 | 72.80 | 7.56 | -4.21 | 6.94 |

feldspar mass = 24.91 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.71Ca0.23Al1.23Si2.77O8
G = -402072.26 (J) H = -345736.36 (J) S = 52.99 (J/K) V = 9.52 (cc) Cp = 30.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.74 | 23.02 | 6.24 |

quartz mass = 0.85 (gm) density = 2.56 (gm/cc)
SiO2
G = -13725.54 (J) H = -11919.61 (J) S = 1.70 (J/K) V = 0.33 (cc) Cp = 0.99 (J/K)

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4205.63 (J) H = -3581.36 (J) S = 0.59 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 84.82 (gm) density = 3.23 (gm/cc)
G = -1257793.29 (J) H = -1078687.11 (J) S = 168.47 (J/K) V = 26.26 (cc) Cp = 96.25 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.06 (gm/cc)
G = -1500723.71 (J) H = -1279040.27 (J) S = 208.52 (J/K) V = 32.66 (cc) Cp = 116.87 (J/K)

Oxygen delta moles = -0.00413298 delta grams = -0.13225
G = 976.67 (J) H = -102.95 (J) S = -1.02 (J/K) V = -365.33 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 780.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.12 COH = 1.07 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 13.24 (gm) density = 2.34 (gm/cc) viscosity = 4.32 (log 10 poise) (analysis in wt %)
G = -213789.32 (J) H = -176255.35 (J) S = 35.64 (J/K) V = 5.66 (cc) Cp = 18.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

66.27 0.23 13.15 0.15 0.00 0.48 1.37 0.19 0.00 0.00 2.32 3.74 3.90 0.88 7.31 0.00 0.00 0.00 0.00

garnet mass = 27.64 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.55Mg0.28)3Al2Si3O12
G = -375178.92 (J) H = -320095.22 (J) S = 52.30 (J/K) V = 7.06 (cc) Cp = 29.87 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.85 | 17.16 | 27.99 |

clinopyroxene mass = 25.63 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.25Mg0.66Fe'"0.03Ti0.04Al0.22Si1.87O6
G = -380313.64 (J) H = -327924.01 (J) S = 49.75 (J/K) V = 7.66 (cc) Cp = 28.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 45.78 | 8.26 | 25.39 | 9.55 | -1.21 | 4.21 | 8.01 |

clinopyroxene mass = 5.37 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.22Mg0.37Fe'"0.03Ti0.40Al0.76Si1.24O6
G = -78802.28 (J) H = -68140.76 (J) S = 10.12 (J/K) V = 1.51 (cc) Cp = 5.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.94 | 1.72 | 21.81 | 73.04 | 7.73 | -4.49 | 7.13 |

biotite mass = 0.84 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -13318.95 (J) H = -11399.77 (J) S = 1.82 (J/K) V = 0.30 (cc) Cp = 1.06 (J/K)

| annite | phlogopite |
|---|---|
| 2.12 | 97.88 |

feldspar mass = 24.86 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.72Ca0.22Al1.22Si2.78O8
G = -400830.13 (J) H = -345392.04 (J) S = 52.64 (J/K) V = 9.51 (cc) Cp = 30.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.56 | 22.12 | 6.32 |

quartz mass = 1.98 (gm) density = 2.56 (gm/cc)
SiO2
G = -32087.30 (J) H = -27922.91 (J) S = 3.95 (J/K) V = 0.78 (cc) Cp = 2.30 (J/K)

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4302.24 (J) H = -3672.05 (J) S = 0.60 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 86.62 (gm) density = 3.22 (gm/cc)
G = -1284833.47 (J) H = -1104546.75 (J) S = 171.19 (J/K) V = 26.91 (cc) Cp = 98.29 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.07 (gm/cc)
G = -1498622.79 (J) H = -1280802.11 (J) S = 206.83 (J/K) V = 32.57 (cc) Cp = 116.54 (J/K)

Oxygen delta moles = -0.00417796 delta grams = -0.13369
G = 977.04 (J) H = -102.60 (J) S = -1.03 (J/K) V = -365.83 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 770.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.54  delta HM = -5.16  NNO = 0.00  QFM = -0.14  COH = 1.04
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid  mass = 11.34 (gm)  density = 2.33 (gm/cc)  viscosity = 3.95 (log 10 poise)  (analysis in wt %)
G = -183099.85 (J)  H = -150784.88 (J)  S = 30.98 (J/K)  V = 4.87 (cc)  Cp = 15.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.17 | 0.18 | 13.01 | 0.15 | 0.00 | 0.48 | 1.60 | 0.17 | 0.00 | 0.00 | 2.47 | 3.96 | 3.64 | 1.00 | 8.16 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 27.65 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.18Fe"0.55Mg0.26)3Al2Si3O12
G = -373819.96 (J)  H = -319629.48 (J)  S = 51.95 (J/K)  V = 7.05 (cc)  Cp = 29.78 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.41 | 18.13 | 26.46 |

clinopyroxene  mass = 24.67 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.84Fe"0.25Mg0.65Fe'"0.03Ti0.04Al0.22Si1.87O6
G = -365461.48 (J)  H = -315819.27 (J)  S = 47.59 (J/K)  V = 7.37 (cc)  Cp = 27.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 46.42 | 7.46 | 25.46 | 9.50 | -1.35 | 4.36 | 8.15 |

clinopyroxene  mass = 5.59 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.91Fe"0.22Mg0.36Fe'"0.03Ti0.41Al0.76Si1.23O6
G = -81710.50 (J)  H = -70803.00 (J)  S = 10.46 (J/K)  V = 1.57 (cc)  Cp = 6.05 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.64 | 1.53 | 22.32 | 73.57 | 7.60 | -4.44 | 7.05 |

biotite  mass = 1.83 (gm)  density = 2.76 (gm/cc)  (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -29118.94 (J)  H = -24978.01 (J)  S = 3.97 (J/K)  V = 0.66 (cc)  Cp = 2.31 (J/K)

| annite | phlogopite |
|---|---|
| 2.29 | 97.71 |

feldspar  mass = 25.45 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.06Na0.72Ca0.22Al1.22Si2.78O8
G = -409844.74 (J)  H = -353950.18 (J)  S = 53.58 (J/K)  V = 9.72 (cc)  Cp = 31.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.59 | 22.41 | 6.00 |

quartz  mass = 3.04 (gm)  density = 2.56 (gm/cc)
SiO2
G = -49079.11 (J)  H = -42797.29 (J)  S = 6.02 (J/K)  V = 1.19 (cc)  Cp = 3.52 (J/K)

apatite  mass = 0.31 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4407.40 (J)  H = -3770.43 (J)  S = 0.61 (J/K)  V = 0.10 (cc)  Cp = 0.34 (J/K)

Total solids  mass = 88.52 (gm)  density = 3.20 (gm/cc)
G = -1313442.13 (J)  H = -1131747.65 (J)  S = 174.18 (J/K)  V = 27.66 (cc)  Cp = 100.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.07 (gm/cc)
G = -1496541.98 (J) H = -1282532.53 (J) S = 205.16 (J/K) V = 32.53 (cc) Cp = 116.29 (J/K)

Oxygen delta moles = -0.00421801 delta grams = -0.134971
G = 976.06 (J) H = -102.11 (J) S = -1.03 (J/K) V = -365.83 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 9.58 (gm) density = 2.31 (gm/cc) viscosity = 3.51 (log 10 poise) (analysis in wt %)
G = -154773.78 (J) H = -127192.73 (J) S = 26.70 (J/K) V = 4.15 (cc) Cp = 13.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.64 | 0.14 | 12.84 | 0.16 | 0.00 | 0.47 | 1.90 | 0.15 | 0.00 | 0.00 | 2.69 | 4.25 | 3.34 | 1.17 | 9.25 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 27.68 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.19Fe"0.56Mg0.25)3Al2Si3O12
G = -372937.50 (J) H = -319582.34 (J) S = 51.64 (J/K) V = 7.05 (cc) Cp = 29.72 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.87 | 19.10 | 25.02 |

clinopyroxene mass = 23.78 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.85Fe"0.26Mg0.64Fe'"0.03Ti0.04Al0.22Si1.88O6
G = -351832.30 (J) H = -304714.93 (J) S = 45.61 (J/K) V = 7.10 (cc) Cp = 26.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 46.98 | 6.77 | 25.54 | 9.43 | -1.51 | 4.50 | 8.30 |

clinopyroxene mass = 5.77 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.23Mg0.35Fe'"0.03Ti0.41Al0.77Si1.23O6
G = -84264.79 (J) H = -73169.17 (J) S = 10.74 (J/K) V = 1.62 (cc) Cp = 6.24 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.35 | 1.36 | 22.80 | 74.12 | 7.48 | -4.41 | 6.99 |

biotite mass = 2.73 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -43327.82 (J) H = -37248.13 (J) S = 5.88 (J/K) V = 0.99 (cc) Cp = 3.44 (J/K)

| annite | phlogopite |
|---|---|
| 2.46 | 97.54 |

feldspar mass = 25.99 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.72Ca0.23Al1.23Si2.77O8
G = -417992.90 (J) H = -361790.56 (J) S = 54.40 (J/K) V = 9.92 (cc) Cp = 31.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.64 | 22.64 | 5.72 |

quartz mass = 4.02 (gm) density = 2.56 (gm/cc)

SiO2
G = -64927.97 (J)  H = -56733.60 (J)  S = 7.93 (J/K)  V = 1.57 (cc)  Cp = 4.66 (J/K)

apatite  mass = 0.31 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4420.02 (J)  H = -3789.86 (J)  S = 0.61 (J/K)  V = 0.10 (cc)  Cp = 0.34 (J/K)

Total solids  mass = 90.28 (gm)  density = 3.18 (gm/cc)
G = -1339703.30 (J)  H = -1157028.59 (J)  S = 176.81 (J/K)  V = 28.35 (cc)  Cp = 102.68 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.86 (gm)  density = 3.07 (gm/cc)
G = -1494477.08 (J)  H = -1284221.32 (J)  S = 203.51 (J/K)  V = 32.50 (cc)  Cp = 116.10 (J/K)

Oxygen  delta moles = -0.00425938  delta grams = -0.136295
G = 975.21 (J)  H = -101.62 (J)  S = -1.04 (J/K)  V = -365.88 (cc)  Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 750.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -15.01  delta HM = -5.18  NNO = 0.00  QFM = -0.16  COH = 0.97
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid  mass = 7.88 (gm)  density = 2.29 (gm/cc)  viscosity = 2.92 (log 10 poise)  (analysis in wt %)
G = -127452.78 (J)  H = -104340.16 (J)  S = 22.59 (J/K)  V = 3.44 (cc)  Cp = 11.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.30 | 0.11 | 12.60 | 0.16 | 0.00 | 0.48 | 2.30 | 0.14 | 0.00 | 0.00 | 3.04 | 4.64 | 2.96 | 1.47 | 10.80 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 27.74 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.20Fe"0.56Mg0.24)3Al2Si3O12
G = -372547.36 (J)  H = -319968.23 (J)  S = 51.39 (J/K)  V = 7.06 (cc)  Cp = 29.70 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.24 | 20.09 | 23.67 |

clinopyroxene  mass = 22.95 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.85Fe"0.26Mg0.64Fe'"0.03Ti0.04Al0.22Si1.88O6
G = -339045.12 (J)  H = -294287.76 (J)  S = 43.74 (J/K)  V = 6.85 (cc)  Cp = 25.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 47.48 | 6.16 | 25.61 | 9.34 | -1.67 | 4.63 | 8.45 |

clinopyroxene  mass = 5.94 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.23Mg0.34Fe'"0.03Ti0.41Al0.77Si1.22O6
G = -86532.95 (J)  H = -75296.09 (J)  S = 10.98 (J/K)  V = 1.67 (cc)  Cp = 6.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.06 | 1.21 | 23.26 | 74.68 | 7.37 | -4.39 | 6.92 |

biotite  mass = 3.55 (gm)  density = 2.76 (gm/cc)  (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -56350.44 (J)  H = -48549.98 (J)  S = 7.62 (J/K)  V = 1.29 (cc)  Cp = 4.47 (J/K)

annite phlogopite
2.62 97.38

feldspar mass = 26.51 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.72Ca0.23Al1.23Si2.77O8
G = -425878.85 (J) H = -369432.57 (J) S = 55.17 (J/K) V = 10.12 (cc) Cp = 32.57 (J/K)
albite anorthite sanidine
71.70 22.82 5.47

quartz mass = 4.98 (gm) density = 2.56 (gm/cc)
SiO2
G = -80318.97 (J) H = -70325.44 (J) S = 9.77 (J/K) V = 1.95 (cc) Cp = 5.77 (J/K)

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4301.68 (J) H = -3696.78 (J) S = 0.59 (J/K) V = 0.10 (cc) Cp = 0.33 (J/K)

Total solids mass = 91.98 (gm) density = 3.17 (gm/cc)
G = -1364975.36 (J) H = -1181556.86 (J) S = 179.27 (J/K) V = 29.02 (cc) Cp = 104.78 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.08 (gm/cc)
G = -1492428.14 (J) H = -1285897.02 (J) S = 201.86 (J/K) V = 32.47 (cc) Cp = 115.98 (J/K)

Oxygen delta moles = -0.00430177 delta grams = -0.137651
G = 974.39 (J) H = -101.13 (J) S = -1.05 (J/K) V = -365.94 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 740.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.17 COH = 0.93
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 6.20 (gm) density = 2.25 (gm/cc) viscosity = 2.11 (log 10 poise) (analysis in wt %)
G = -100391.33 (J) H = -81607.08 (J) S = 18.54 (J/K) V = 2.75 (cc) Cp = 9.02 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O
CO2 SO3 Cl2O-1 F2O-1
57.39 0.07 12.21 0.18 0.00 0.49 2.93 0.12 0.00 0.00 3.71 5.18 2.46 2.04 13.22 0.00 0.00 0.00
0.00

garnet mass = 27.83 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.21Fe"0.57Mg0.22)3Al2Si3O12
G = -372664.95 (J) H = -320800.75 (J) S = 51.19 (J/K) V = 7.08 (cc) Cp = 29.70 (J/K)
almandine grossular pyrope
56.52 21.06 22.42

clinopyroxene mass = 22.18 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.86Fe"0.26Mg0.63Fe'"0.03Ti0.04Al0.23Si1.88O6
G = -327112.15 (J) H = -284554.95 (J) S = 42.00 (J/K) V = 6.61 (cc) Cp = 24.63 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
47.95 5.63 25.68 9.23 -1.83 4.74 8.60

clinopyroxene mass = 6.09 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.24Mg0.34Fe'"0.03Ti0.41Al0.78Si1.22O6
G = -88513.66 (J) H = -77181.25 (J) S = 11.19 (J/K) V = 1.71 (cc) Cp = 6.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.75 | 1.08 | 23.68 | 75.25 | 7.26 | -4.39 | 6.87 |

biotite mass = 4.31 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -68138.91 (J) H = -58835.64 (J) S = 9.18 (J/K) V = 1.56 (cc) Cp = 5.41 (J/K)

| annite | phlogopite |
|---|---|
| 2.78 | 97.22 |

feldspar mass = 27.06 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.72Ca0.23Al1.23Si2.77O8
G = -434257.56 (J) H = -377530.78 (J) S = 55.99 (J/K) V = 10.32 (cc) Cp = 33.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.77 | 22.94 | 5.29 |

quartz mass = 5.92 (gm) density = 2.59 (gm/cc)
SiO2
G = -95386.23 (J) H = -83825.70 (J) S = 11.41 (J/K) V = 2.28 (cc) Cp = 7.98 (J/K)

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3928.67 (J) H = -3383.88 (J) S = 0.54 (J/K) V = 0.09 (cc) Cp = 0.30 (J/K)

Total solids mass = 93.66 (gm) density = 3.16 (gm/cc)
G = -1390002.14 (J) H = -1206112.96 (J) S = 181.50 (J/K) V = 29.65 (cc) Cp = 108.08 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.08 (gm/cc)
G = -1490393.47 (J) H = -1287720.04 (J) S = 200.04 (J/K) V = 32.40 (cc) Cp = 117.10 (J/K)

Oxygen delta moles = -0.0043468 delta grams = -0.139092
G = 973.98 (J) H = -100.67 (J) S = -1.06 (J/K) V = -366.16 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 730.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.18 COH = 0.89 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 4.57 (gm) density = 2.20 (gm/cc) viscosity = 0.96 (log 10 poise) (analysis in wt %)
G = -74139.17 (J) H = -59496.11 (J) S = 14.60 (J/K) V = 2.08 (cc) Cp = 6.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 50.14 | 0.04 | 11.38 | 0.20 | 0.00 | 0.51 | 3.98 | 0.10 | 0.00 | 0.00 | 5.22 | 5.97 | 1.79 | 3.36 | 17.32 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 27.96 (gm) density = 3.93 (gm/cc) (analysis in mole %)

(Ca0.22Fe"0.57Mg0.21)3Al2Si3O12
G = -373559.08 (J) H = -322317.08 (J) S = 51.08 (J/K) V = 7.11 (cc) Cp = 29.77 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.70 | 22.05 | 21.24 |

clinopyroxene mass = 21.45 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.86Fe"0.26Mg0.62Fe'"0.03Ti0.04Al0.23Si1.88O6
G = -315940.12 (J) H = -275440.70 (J) S = 40.37 (J/K) V = 6.39 (cc) Cp = 23.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 48.39 | 5.15 | 25.69 | 9.11 | -1.99 | 4.87 | 8.79 |

clinopyroxene mass = 6.22 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.24Mg0.33Fe'"0.03Ti0.41Al0.78Si1.21O6
G = -90242.13 (J) H = -78853.66 (J) S = 11.35 (J/K) V = 1.74 (cc) Cp = 6.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.43 | 0.96 | 24.06 | 75.80 | 7.18 | -4.40 | 6.83 |

biotite mass = 4.99 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -78874.95 (J) H = -68255.75 (J) S = 10.59 (J/K) V = 1.80 (cc) Cp = 6.27 (J/K)

| annite | phlogopite |
|---|---|
| 2.91 | 97.09 |

feldspar mass = 27.60 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.72Ca0.23Al1.23Si2.77O8
G = -442452.82 (J) H = -385502.97 (J) S = 56.77 (J/K) V = 10.53 (cc) Cp = 34.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.93 | 23.02 | 5.05 |

quartz mass = 6.85 (gm) density = 2.60 (gm/cc)
SiO2
G = -110167.67 (J) H = -97023.14 (J) S = 13.10 (J/K) V = 2.64 (cc) Cp = 9.15 (J/K)

apatite mass = 0.21 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3003.85 (J) H = -2593.15 (J) S = 0.41 (J/K) V = 0.07 (cc) Cp = 0.23 (J/K)

Total solids mass = 95.29 (gm) density = 3.15 (gm/cc)
G = -1414240.62 (J) H = -1229986.44 (J) S = 183.68 (J/K) V = 30.28 (cc) Cp = 110.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.09 (gm/cc)
G = -1488379.79 (J) H = -1289482.55 (J) S = 198.27 (J/K) V = 32.36 (cc) Cp = 117.32 (J/K)

Oxygen delta moles = -0.00438953 delta grams = -0.14046
G = 972.85 (J) H = -100.13 (J) S = -1.07 (J/K) V = -366.11 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 720.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = -0.20 COH = 0.85
IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 3.78 (gm) density = 2.16 (gm/cc) viscosity = 0.23 (log 10 poise) (analysis in wt %)
G = -61256.80 (J) H = -48758.18 (J) S = 12.58 (J/K) V = 1.75 (cc) Cp = 5.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43.75 | 0.02 | 10.38 | 0.20 | 0.00 | 0.48 | 4.81 | 0.08 | 0.00 | 0.00 | 7.03 | 6.40 | 1.35 | 4.98 | 20.51 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 28.17 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.23Fe"0.57Mg0.20)3Al2Si3O12
G = -375518.91 (J) H = -324762.87 (J) S = 51.11 (J/K) V = 7.16 (cc) Cp = 29.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.79 | 22.81 | 20.40 |

clinopyroxene mass = 20.95 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.86Fe"0.25Mg0.62Fe'"0.03Ti0.03Al0.23Si1.88O6
G = -308423.22 (J) H = -269495.76 (J) S = 39.20 (J/K) V = 6.25 (cc) Cp = 23.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 49.03 | 4.77 | 25.46 | 8.94 | -2.11 | 4.91 | 9.00 |

clinopyroxene mass = 6.31 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.24Mg0.33Fe'"0.03Ti0.42Al0.79Si1.21O6
G = -91387.59 (J) H = -80026.26 (J) S = 11.44 (J/K) V = 1.76 (cc) Cp = 6.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.91 | 0.87 | 24.22 | 76.32 | 7.15 | -4.50 | 6.85 |

biotite mass = 5.42 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -85413.78 (J) H = -74080.59 (J) S = 11.41 (J/K) V = 1.96 (cc) Cp = 6.79 (J/K)

| annite | phlogopite |
|---|---|
| 2.93 | 97.07 |

feldspar mass = 27.78 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.72Ca0.23Al1.23Si2.77O8
G = -444762.58 (J) H = -388369.17 (J) S = 56.78 (J/K) V = 10.59 (cc) Cp = 35.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.38 | 22.93 | 4.69 |

quartz mass = 7.33 (gm) density = 2.60 (gm/cc)
SiO2
G = -117788.85 (J) H = -103955.65 (J) S = 13.93 (J/K) V = 2.82 (cc) Cp = 9.71 (J/K)

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1830.65 (J) H = -1583.92 (J) S = 0.25 (J/K) V = 0.04 (cc) Cp = 0.14 (J/K)

Total solids mass = 96.08 (gm) density = 3.14 (gm/cc)
G = -1425125.58 (J) H = -1242274.23 (J) S = 184.11 (J/K) V = 30.57 (cc) Cp = 111.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.09 (gm/cc)
G = -1486382.38 (J) H = -1291032.41 (J) S = 196.70 (J/K) V = 32.32 (cc) Cp = 117.67 (J/K)

Oxygen delta moles = -0.00443326 delta grams = -0.141859
G = 971.75 (J) H = -99.58 (J) S = -1.08 (J/K) V = -366.07 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 710.00 (C) P = 7.000 (kbars) log(10) f O2 = -16.00 delta HM = -5.22 NNO = 0.00 QFM = -0.21 COH = 0.81 IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid mass = 3.40 (gm) density = 2.15 (gm/cc) viscosity = -0.22 (log 10 poise) (analysis in wt %)
G = -54980.06 (J) H = -43634.33 (J) S = 11.54 (J/K) V = 1.58 (cc) Cp = 5.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 38.91 | 0.02 | 9.43 | 0.18 | 0.00 | 0.42 | 5.35 | 0.07 | 0.00 | 0.00 | 8.92 | 6.51 | 1.08 | 6.66 | 22.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 28.41 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.23Fe"0.57Mg0.20)3Al2Si3O12
G = -378004.37 (J) H = -327674.09 (J) S = 51.19 (J/K) V = 7.21 (cc) Cp = 30.11 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.82 | 23.47 | 19.71 |

clinopyroxene mass = 20.56 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.86Fe"0.25Mg0.62Fe'"0.03Ti0.03Al0.23Si1.89O6
G = -302634.37 (J) H = -265042.73 (J) S = 38.24 (J/K) V = 6.13 (cc) Cp = 22.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 49.75 | 4.44 | 25.10 | 8.76 | -2.20 | 4.91 | 9.24 |

clinopyroxene mass = 6.38 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.24Mg0.32Fe'"0.03Ti0.42Al0.79Si1.21O6
G = -92275.45 (J) H = -80979.01 (J) S = 11.49 (J/K) V = 1.78 (cc) Cp = 6.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.29 | 0.78 | 24.26 | 76.83 | 7.15 | -4.64 | 6.90 |

biotite mass = 5.71 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -89963.35 (J) H = -78203.75 (J) S = 11.96 (J/K) V = 2.06 (cc) Cp = 7.15 (J/K)

| annite | phlogopite |
|---|---|
| 2.88 | 97.12 |

feldspar mass = 27.76 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.73Ca0.23Al1.23Si2.77O8
G = -443978.62 (J) H = -388539.12 (J) S = 56.39 (J/K) V = 10.58 (cc) Cp = 35.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.95 | 22.75 | 4.31 |

quartz mass = 7.60 (gm) density = 2.60 (gm/cc)
SiO2
G = -122025.35 (J) H = -107921.98 (J) S = 14.35 (J/K) V = 2.92 (cc) Cp = 9.99 (J/K)

apatite mass = 0.04 (gm) density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -538.89 (J)  H = -467.30 (J)  S = 0.07 (J/K)  V = 0.01 (cc)  Cp = 0.04 (J/K)

Total solids  mass = 96.46 (gm)  density = 3.14 (gm/cc)
G = -1429420.41 (J)  H = -1248827.99 (J)  S = 183.69 (J/K)  V = 30.70 (cc)  Cp = 112.66 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.86 (gm)  density = 3.09 (gm/cc)
G = -1484400.47 (J)  H = -1292462.32 (J)  S = 195.23 (J/K)  V = 32.28 (cc)  Cp = 118.13 (J/K)

Oxygen  delta moles = -0.00447635  delta grams = -0.143238
G = 970.31 (J)  H = -98.99 (J)  S = -1.09 (J/K)  V = -365.91 (cc)  Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 700.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -16.26  delta HM = -5.23  NNO = 0.00  QFM = -0.22  COH = 0.77
IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid  mass = 3.15 (gm)  density = 2.14 (gm/cc)  viscosity = -0.49 (log 10 poise)  (analysis in wt %)
G = -50853.49 (J)  H = -40311.73 (J)  S = 10.83 (J/K)  V = 1.47 (cc)  Cp = 5.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35.71 | 0.01 | 8.75 | 0.17 | 0.00 | 0.37 | 5.77 | 0.06 | 0.00 | 0.00 | 10.06 | 6.59 | 0.90 | 7.69 | 23.93 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 28.67 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.24Fe"0.57Mg0.19)3Al2Si3O12
G = -380886.04 (J)  H = -330941.50 (J)  S = 51.32 (J/K)  V = 7.28 (cc)  Cp = 30.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.82 | 24.08 | 19.10 |

clinopyroxene  mass = 20.20 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.09Ca0.86Fe"0.25Mg0.62Fe'"0.03Ti0.03Al0.23Si1.89O6
G = -297339.31 (J)  H = -261002.85 (J)  S = 37.34 (J/K)  V = 6.03 (cc)  Cp = 22.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 50.52 | 4.14 | 24.68 | 8.56 | -2.29 | 4.91 | 9.48 |

clinopyroxene  mass = 6.44 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.92Fe"0.24Mg0.32Fe'"0.02Ti0.42Al0.80Si1.20O6
G = -93062.96 (J)  H = -81847.50 (J)  S = 11.52 (J/K)  V = 1.80 (cc)  Cp = 6.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -11.63 | 0.71 | 24.25 | 77.32 | 7.17 | -4.78 | 6.96 |

biotite  mass = 5.95 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.03Mg0.97)3AlSi3O10(OH)2
G = -93703.02 (J)  H = -81640.04 (J)  S = 12.40 (J/K)  V = 2.15 (cc)  Cp = 7.44 (J/K)

| annite | phlogopite |
|---|---|
| 2.81 | 97.19 |

feldspar  mass = 27.64 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)

K0.04Na0.74Ca0.23Al1.23Si2.77O8
G = -441534.35 (J)  H = -387253.51 (J)  S = 55.78 (J/K)  V = 10.53 (cc)  Cp = 36.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.56 | 22.51 | 3.93 |

quartz mass = 7.80 (gm)  density = 2.61 (gm/cc)
SiO2
G = -125054.08 (J)  H = -110832.45 (J)  S = 14.61 (J/K)  V = 2.99 (cc)  Cp = 10.17 (J/K)

Total solids mass = 96.70 (gm)  density = 3.14 (gm/cc)
G = -1431579.75 (J)  H = -1253517.85 (J)  S = 182.97 (J/K)  V = 30.77 (cc)  Cp = 113.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm)  density = 3.10 (gm/cc)
G = -1482433.25 (J)  H = -1293829.58 (J)  S = 193.81 (J/K)  V = 32.25 (cc)  Cp = 118.53 (J/K)

Oxygen delta moles = -0.00451903  delta grams = -0.144604
G = 968.59 (J)  H = -98.37 (J)  S = -1.10 (J/K)  V = -365.64 (cc)  Cp = -0.16 (J/K)

**********----------**********
Title: mafic

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.68 (gm/cc)  viscosity = 2.02 (log 10 poise)  (analysis in wt %)
G = -1624020.50 (J)  H = -1178268.93 (J)  S = 283.35 (J/K)  V = 37.27 (cc)  Cp = 148.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.63 | 0.00 | 8.43 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.02 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.68 (gm/cc)
G = -1624020.50 (J)  H = -1178268.93 (J)  S = 283.35 (J/K)  V = 37.27 (cc)  Cp = 148.82 (J/K)

Oxygen  delta moles = -2.08167e-16  delta grams = -6.66109e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: mafic

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.69 (gm/cc)  viscosity = 2.06 (log 10 poise)  (analysis in wt %)
G = -1621194.31 (J)  H = -1179759.23 (J)  S = 282.40 (J/K)  V = 37.23 (cc)  Cp = 148.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.63 | 0.00 | 8.43 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.06 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.69 (gm/cc)
G = -1621194.31 (J)  H = -1179759.23 (J)  S = 282.40 (J/K)  V = 37.23 (cc)  Cp = 148.81 (J/K)

Oxygen  delta moles = 4.67985e-06  delta grams = 0.00014975
G = -1.70 (J)  H = 0.20 (J)  S = 0.00 (J/K)  V = 0.61 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.69 (gm/cc)  viscosity = 2.10 (log 10 poise)  (analysis in wt %)
G = -1618378.01 (J)  H = -1181249.75 (J)  S = 281.45 (J/K)  V = 37.20 (cc)  Cp = 148.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.64 | 0.00 | 8.43 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.10 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.69 (gm/cc)
G = -1618378.01 (J)  H = -1181249.75 (J)  S = 281.45 (J/K)  V = 37.20 (cc)  Cp = 148.80 (J/K)

Oxygen  delta moles = 1.00279e-05  delta grams = 0.000320882
G = -3.61 (J)  H = 0.43 (J)  S = 0.00 (J/K)  V = 1.29 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.69 (gm/cc)  viscosity = 2.14 (log 10 poise)  (analysis in wt %)
G = -1615571.66 (J)  H = -1182740.50 (J)  S = 280.49 (J/K)  V = 37.17 (cc)  Cp = 148.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.64 | 0.00 | 8.43 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.14 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.69 (gm/cc)
G = -1615571.66 (J)  H = -1182740.50 (J)  S = 280.49 (J/K)  V = 37.17 (cc)  Cp = 148.80 (J/K)

Oxygen  delta moles = 1.60629e-05  delta grams = 0.000513992
G = -5.74 (J)  H = 0.68 (J)  S = 0.00 (J/K)  V = 2.06 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1260.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.18  COH = 2.11  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.69 (gm/cc)  viscosity = 2.19 (log 10 poise)  (analysis in wt %)
G = -1612775.33 (J)  H = -1184231.50 (J)  S = 279.52 (J/K)  V = 37.14 (cc)  Cp = 148.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.05 | 1.16 | 15.90 | 1.64 | 0.00 | 8.42 | 0.18 | 5.69 | 0.00 | 0.00 | 9.91 | 2.90 | 0.89 | 0.24 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 2.19 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.69 (gm/cc)
G = -1612775.33 (J)  H = -1184231.50 (J)  S = 279.52 (J/K)  V = 37.14 (cc)  Cp = 148.79 (J/K)

Oxygen  delta moles = 2.2804e-05  delta grams = 0.000729699
G = -8.10 (J)  H = 0.95 (J)  S = 0.01 (J/K)  V = 2.91 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1250.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.17  COH = 2.10  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 96.23 (gm)  density = 2.69 (gm/cc)  viscosity = 2.26 (log 10 poise)  (analysis in wt %)
G = -1549646.46 (J)  H = -1140858.76 (J)  S = 268.38 (J/K)  V = 35.78 (cc)  Cp = 142.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.10 | 1.19 | 16.32 | 1.64 | 0.00 | 8.45 | 0.19 | 5.24 | 0.00 | 0.00 | 9.65 | 3.00 | 0.92 | 0.25 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 3.77 (gm)  density = 3.25 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.65Fe"0.24Mg0.94Fe'"0.05Ti0.01Al0.22Si1.87O6
G = -60348.91 (J)  H = -46524.38 (J)  S = 9.08 (J/K)  V = 1.16 (cc)  Cp = 4.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.48 | 32.40 | 23.50 | 8.36 | -6.66 | 11.71 | 2.20 |

Total solids  mass = 3.77 (gm)  density = 3.25 (gm/cc)
G = -60348.91 (J)  H = -46524.38 (J)  S = 9.08 (J/K)  V = 1.16 (cc)  Cp = 4.52 (J/K)

Viscosity of the System: 2.32 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.71 (gm/cc)
G = -1609995.36 (J)  H = -1187383.14 (J)  S = 277.46 (J/K)  V = 36.94 (cc)  Cp = 147.37 (J/K)

Oxygen  delta moles = 3.25874e-05  delta grams = 0.00104276

G = -11.49 (J)  H = 1.35 (J)  S = 0.01 (J/K)  V = 4.13 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1240.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.17  COH = 2.08  IW = 4.15

Constraint Flags: fO2 path = NNO

Liquid  mass = 92.35 (gm)  density = 2.69 (gm/cc)  viscosity = 2.35 (log 10 poise)  (analysis in wt %)
G = -1485177.71 (J)  H = -1096270.03 (J)  S = 257.02 (J/K)  V = 34.39 (cc)  Cp = 136.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.18 | 1.23 | 16.76 | 1.63 | 0.00 | 8.47 | 0.20 | 4.79 | 0.00 | 0.00 | 9.32 | 3.11 | 0.96 | 0.26 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 7.66 (gm)  density = 3.26 (gm/cc)  (analysis in mole %)
cpx Na0.02Ca0.67Fe"0.24Mg0.91Fe'''0.05Ti0.01Al0.24Si1.86O6
G = -122070.82 (J)  H = -94317.26 (J)  S = 18.34 (J/K)  V = 2.35 (cc)  Cp = 9.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.69 | 30.56 | 23.87 | 9.03 | -7.04 | 12.48 | 2.41 |

Total solids  mass = 7.66 (gm)  density = 3.26 (gm/cc)
G = -122070.82 (J)  H = -94317.26 (J)  S = 18.34 (J/K)  V = 2.35 (cc)  Cp = 9.14 (J/K)

Viscosity of the System: 2.46 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.72 (gm/cc)
G = -1607248.53 (J)  H = -1190587.29 (J)  S = 275.36 (J/K)  V = 36.74 (cc)  Cp = 145.91 (J/K)

Oxygen  delta moles = 6.36238e-05  delta grams = 0.00203588
G = -22.26 (J)  H = 2.61 (J)  S = 0.02 (J/K)  V = 8.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1230.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.23  delta HM = -4.84  NNO = 0.00  QFM = 0.16  COH = 2.06  IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid  mass = 88.73 (gm)  density = 2.68 (gm/cc)  viscosity = 2.43 (log 10 poise)  (analysis in wt %)
G = -1425435.39 (J)  H = -1055001.51 (J)  S = 246.44 (J/K)  V = 33.10 (cc)  Cp = 131.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.30 | 1.26 | 17.17 | 1.61 | 0.00 | 8.46 | 0.20 | 4.38 | 0.00 | 0.00 | 8.98 | 3.22 | 1.00 | 0.27 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 11.28 (gm)  density = 3.27 (gm/cc)  (analysis in mole %)
cpx Na0.03Ca0.68Fe"0.24Mg0.88Fe'''0.06Ti0.01Al0.25Si1.85O6
G = -179095.98 (J)  H = -138660.66 (J)  S = 26.90 (J/K)  V = 3.45 (cc)  Cp = 13.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.98 | 29.46 | 24.48 | 9.68 | -7.39 | 13.19 | 2.60 |

Total solids mass = 11.28 (gm) density = 3.27 (gm/cc)
G = -179095.98 (J) H = -138660.66 (J) S = 26.90 (J/K) V = 3.45 (cc) Cp = 13.41 (J/K)

Viscosity of the System: 2.61 (log 10 poise)

System mass = 100.00 (gm) density = 2.74 (gm/cc)
G = -1604531.37 (J) H = -1193662.17 (J) S = 273.34 (J/K) V = 36.54 (cc) Cp = 144.55 (J/K)

Oxygen delta moles = 0.000111039 delta grams = 0.0035531
G = -38.56 (J) H = 4.52 (J) S = 0.03 (J/K) V = 13.88 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 85.35 (gm) density = 2.68 (gm/cc) viscosity = 2.51 (log 10 poise) (analysis in wt %)
G = -1369997.79 (J) H = -1016763.71 (J) S = 236.57 (J/K) V = 31.89 (cc) Cp = 125.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 52.45 | 1.28 | 17.56 | 1.60 | 0.00 | 8.42 | 0.21 | 4.00 | 0.00 | 0.00 | 8.64 | 3.33 | 1.04 | 0.28 | 1.18 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 14.66 (gm) density = 3.28 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.68Fe"0.25Mg0.86Fe'"0.06Ti0.01Al0.27Si1.84O6
G = -231843.51 (J) H = -179850.71 (J) S = 34.82 (J/K) V = 4.47 (cc) Cp = 17.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.81 | 28.73 | 25.21 | 10.31 | -7.72 | 13.87 | 2.80 |

Total solids mass = 14.66 (gm) density = 3.28 (gm/cc)
G = -231843.51 (J) H = -179850.71 (J) S = 34.82 (J/K) V = 4.47 (cc) Cp = 17.38 (J/K)

Viscosity of the System: 2.76 (log 10 poise)

System mass = 100.01 (gm) density = 2.75 (gm/cc)
G = -1601841.30 (J) H = -1196614.42 (J) S = 271.39 (J/K) V = 36.36 (cc) Cp = 143.29 (J/K)

Oxygen delta moles = 0.000171563 delta grams = 0.00548982
G = -59.14 (J) H = 6.92 (J) S = 0.04 (J/K) V = 21.30 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1210.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.15 COH = 2.02 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 82.18 (gm) density = 2.67 (gm/cc) viscosity = 2.60 (log 10 poise) (analysis in wt %)
G = -1318439.29 (J) H = -981258.39 (J) S = 227.34 (J/K) V = 30.77 (cc) Cp = 121.04 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
52.63 1.30 17.93 1.58 0.00 8.35 0.22 3.65 0.00 0.00 8.30 3.43 1.08 0.29 1.23 0.00 0.00 0.00 0.00

clinopyroxene mass = 17.82 (gm) density = 3.29 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.69Fe"0.26Mg0.83Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -280736.78 (J) H = -218195.24 (J) S = 42.17 (J/K) V = 5.42 (cc) Cp = 21.07 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
25.36 28.22 26.01 10.93 -8.02 14.50 3.00

Total solids mass = 17.82 (gm) density = 3.29 (gm/cc)
G = -280736.78 (J) H = -218195.24 (J) S = 42.17 (J/K) V = 5.42 (cc) Cp = 21.07 (J/K)

Viscosity of the System: 2.91 (log 10 poise)

System mass = 100.01 (gm) density = 2.76 (gm/cc)
G = -1599176.08 (J) H = -1199453.63 (J) S = 269.51 (J/K) V = 36.20 (cc) Cp = 142.12 (J/K)

Oxygen delta moles = 0.000242486 delta grams = 0.00775927
G = -82.96 (J) H = 9.69 (J) S = 0.06 (J/K) V = 29.90 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1200.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.14 COH = 2.01 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 79.22 (gm) density = 2.67 (gm/cc) viscosity = 2.69 (log 10 poise) (analysis in wt %)
G = -1270377.44 (J) H = -948191.15 (J) S = 218.71 (J/K) V = 29.72 (cc) Cp = 112.94 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
52.85 1.31 18.28 1.55 0.00 8.25 0.23 3.33 0.00 0.00 7.96 3.54 1.12 0.31 1.27 0.00 0.00 0.00 0.00

clinopyroxene mass = 20.79 (gm) density = 3.29 (gm/cc) (analysis in mole %)
cpx Na0.03Ca0.69Fe"0.27Mg0.81Fe'"0.07Ti0.02Al0.30Si1.82O6
G = -326156.14 (J) H = -253973.62 (J) S = 49.00 (J/K) V = 6.31 (cc) Cp = 24.52 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
23.74 27.88 26.85 11.53 -8.30 15.10 3.20

Total solids mass = 20.79 (gm) density = 3.29 (gm/cc)
G = -326156.14 (J) H = -253973.62 (J) S = 49.00 (J/K) V = 6.31 (cc) Cp = 24.52 (J/K)

Viscosity of the System: 3.07 (log 10 poise)

System mass = 100.01 (gm) density = 2.78 (gm/cc)
G = -1596533.58 (J) H = -1202164.77 (J) S = 267.70 (J/K) V = 36.04 (cc) Cp = 137.46 (J/K)

Oxygen delta moles = 0.000321231 delta grams = 0.010279
G = -109.08 (J) H = 12.72 (J) S = 0.08 (J/K) V = 39.35 (cc) Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1190.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.68  delta HM = -4.86  NNO = 0.00  QFM = 0.14  COH = 1.99  IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid  mass = 76.43 (gm)  density = 2.66 (gm/cc)  viscosity = 2.78 (log 10 poise)  (analysis in wt %)
G = -1225475.80 (J)  H = -917337.31 (J)  S = 210.60 (J/K)  V = 28.74 (cc)  Cp = 108.74 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.09 | 1.32 | 18.60 | 1.52 | 0.00 | 8.12 | 0.24 | 3.04 | 0.00 | 0.00 | 7.62 | 3.64 | 1.16 | 0.32 | 1.32 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 23.59 (gm)  density = 3.30 (gm/cc)  (analysis in mole %)
cpx Na0.03Ca0.69Fe"0.28Mg0.79Fe'"0.07Ti0.02Al0.31Si1.81O6
G = -368435.84 (J)  H = -287432.94 (J)  S = 55.36 (J/K)  V = 7.14 (cc)  Cp = 27.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.99 | 27.65 | 27.73 | 12.12 | -8.56 | 15.66 | 3.42 |

Total solids  mass = 23.59 (gm)  density = 3.30 (gm/cc)
G = -368435.84 (J)  H = -287432.94 (J)  S = 55.36 (J/K)  V = 7.14 (cc)  Cp = 27.73 (J/K)

Viscosity of the System: 3.23 (log 10 poise)

System  mass = 100.01 (gm)  density = 2.79 (gm/cc)
G = -1593911.63 (J)  H = -1204770.26 (J)  S = 265.96 (J/K)  V = 35.88 (cc)  Cp = 136.47 (J/K)

Oxygen  delta moles = 0.00040522  delta grams = 0.0129666
G = -136.55 (J)  H = 15.90 (J)  S = 0.10 (J/K)  V = 49.30 (cc)  Cp = 0.01 (J/K)

**********----------**********
Title: mafic

T = 1180.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.80  delta HM = -4.86  NNO = 0.00  QFM = 0.13  COH = 1.97  IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid  mass = 73.80 (gm)  density = 2.65 (gm/cc)  viscosity = 2.88 (log 10 poise)  (analysis in wt %)
G = -1183463.01 (J)  H = -888515.48 (J)  S = 202.97 (J/K)  V = 27.82 (cc)  Cp = 104.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.35 | 1.33 | 18.91 | 1.49 | 0.00 | 7.96 | 0.25 | 2.77 | 0.00 | 0.00 | 7.29 | 3.75 | 1.20 | 0.33 | 1.37 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 26.22 (gm)  density = 3.31 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.69Fe"0.29Mg0.77Fe'"0.07Ti0.02Al0.32Si1.80O6
G = -407845.27 (J)  H = -318772.68 (J)  S = 61.30 (J/K)  V = 7.92 (cc)  Cp = 30.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 20.17 | 27.51 | 28.62 | 12.69 | -8.80 | 16.18 | 3.64 |

Total solids  mass = 26.22 (gm)  density = 3.31 (gm/cc)

G = -407845.27 (J)  H = -318772.68 (J)  S = 61.30 (J/K)  V = 7.92 (cc)  Cp = 30.75 (J/K)

Viscosity of the System: 3.39 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.80 (gm/cc)
G = -1591308.28 (J)  H = -1207288.16 (J)  S = 264.27 (J/K)  V = 35.74 (cc)  Cp = 135.54 (J/K)

Oxygen  delta moles = 0.000491884  delta grams = 0.0157397
G = -164.49 (J)  H = 19.12 (J)  S = 0.13 (J/K)  V = 59.43 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1170.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.91  delta HM = -4.87  NNO = 0.00  QFM = 0.12  COH = 1.95  IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid  mass = 71.32 (gm)  density = 2.65 (gm/cc)  viscosity = 2.98 (log 10 poise)  (analysis in wt %)
G = -1144110.14 (J)  H = -861562.62 (J)  S = 195.79 (J/K)  V = 26.96 (cc)  Cp = 101.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 53.64 | 1.32 | 19.20 | 1.45 | 0.00 | 7.78 | 0.25 | 2.53 | 0.00 | 0.00 | 6.97 | 3.85 | 1.25 | 0.34 | 1.42 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 28.69 (gm)  density = 3.32 (gm/cc)  (analysis in mole %)
cpx Na0.04Ca0.69Fe"0.30Mg0.75Fe'"0.08Ti0.02Al0.34Si1.79O6
G = -444611.50 (J)  H = -348161.47 (J)  S = 66.83 (J/K)  V = 8.65 (cc)  Cp = 33.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.32 | 27.44 | 29.51 | 13.24 | -9.02 | 16.66 | 3.86 |

Total solids  mass = 28.69 (gm)  density = 3.32 (gm/cc)
G = -444611.50 (J)  H = -348161.47 (J)  S = 66.83 (J/K)  V = 8.65 (cc)  Cp = 33.57 (J/K)

Viscosity of the System: 3.55 (log 10 poise)

System  mass = 100.02 (gm)  density = 2.81 (gm/cc)
G = -1588721.64 (J)  H = -1209724.09 (J)  S = 262.62 (J/K)  V = 35.60 (cc)  Cp = 134.67 (J/K)

Oxygen  delta moles = 0.000578682  delta grams = 0.0185171
G = -192.03 (J)  H = 22.29 (J)  S = 0.15 (J/K)  V = 69.43 (cc)  Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1160.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.12  COH = 1.93  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 68.99 (gm)  density = 2.64 (gm/cc)  viscosity = 3.08 (log 10 poise)  (analysis in wt %)
G = -1107221.82 (J)  H = -836339.33 (J)  S = 189.01 (J/K)  V = 26.14 (cc)  Cp = 97.63 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

53.96 1.32 19.47 1.41 0.00 7.56 0.26 2.31 0.00 0.00 6.66 3.94 1.29 0.35 1.46 0.00 0.00 0.00 0.00

clinopyroxene mass = 31.03 (gm) density = 3.33 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.68Fe"0.30Mg0.74Fe'"0.08Ti0.02Al0.35Si1.78O6
G = -478928.13 (J) H = -375743.43 (J) S = 72.00 (J/K) V = 9.33 (cc) Cp = 36.22 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
16.45 27.42 30.40 13.77 -9.23 17.10 4.09

Total solids mass = 31.03 (gm) density = 3.33 (gm/cc)
G = -478928.13 (J) H = -375743.43 (J) S = 72.00 (J/K) V = 9.33 (cc) Cp = 36.22 (J/K)

Viscosity of the System: 3.72 (log 10 poise)

System mass = 100.02 (gm) density = 2.82 (gm/cc)
G = -1586149.95 (J) H = -1212082.76 (J) S = 261.01 (J/K) V = 35.47 (cc) Cp = 133.85 (J/K)

Oxygen delta moles = 0.000663164 delta grams = 0.0212204
G = -218.37 (J) H = 25.30 (J) S = 0.17 (J/K) V = 79.02 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1150.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.11 COH = 1.91 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 66.79 (gm) density = 2.63 (gm/cc) viscosity = 3.18 (log 10 poise) (analysis in wt %)
G = -1072628.77 (J) H = -812724.56 (J) S = 182.63 (J/K) V = 25.38 (cc) Cp = 94.37 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
54.29 1.31 19.72 1.37 0.00 7.32 0.27 2.10 0.00 0.00 6.36 4.04 1.33 0.36 1.51 0.00 0.00 0.00 0.00

clinopyroxene mass = 33.24 (gm) density = 3.33 (gm/cc) (analysis in mole %)
cpx Na0.04Ca0.68Fe"0.31Mg0.72Fe'"0.08Ti0.02Al0.36Si1.78O6
G = -510962.77 (J) H = -401643.67 (J) S = 76.81 (J/K) V = 9.97 (cc) Cp = 38.70 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
14.60 27.44 31.27 14.28 -9.42 17.51 4.33

Total solids mass = 33.24 (gm) density = 3.33 (gm/cc)
G = -510962.77 (J) H = -401643.67 (J) S = 76.81 (J/K) V = 9.97 (cc) Cp = 38.70 (J/K)

Viscosity of the System: 3.90 (log 10 poise)

System mass = 100.02 (gm) density = 2.83 (gm/cc)
G = -1583591.54 (J) H = -1214368.22 (J) S = 259.44 (J/K) V = 35.35 (cc) Cp = 133.07 (J/K)

Oxygen delta moles = 0.00074304 delta grams = 0.0237764
G = -242.77 (J) H = 28.07 (J) S = 0.19 (J/K) V = 87.92 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 1140.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.89  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 64.59 (gm)  density = 2.62 (gm/cc)  viscosity = 3.28 (log 10 poise)  (analysis in wt %)
G = -1038029.11 (J)  H = -788929.34 (J)  S = 176.27 (J/K)  V = 24.61 (cc)  Cp = 91.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.64 | 1.30 | 19.94 | 1.33 | 0.00 | 7.08 | 0.28 | 1.92 | 0.00 | 0.00 | 6.07 | 4.13 | 1.38 | 0.38 | 1.56 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 35.28 (gm)  density = 3.34 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.68Fe"0.32Mg0.70Fe'"0.08Ti0.03Al0.37Si1.77O6
G = -540330.33 (J)  H = -425539.35 (J)  S = 81.23 (J/K)  V = 10.56 (cc)  Cp = 40.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 12.69 | 27.57 | 32.17 | 14.73 | -9.58 | 17.84 | 4.57 |

feldspar  mass = 0.16 (gm)  density = 2.67 (gm/cc)  (analysis in mole %)
K0.01Na0.38Ca0.61Al1.61Si2.39O8
G = -2682.09 (J)  H = -2141.67 (J)  S = 0.38 (J/K)  V = 0.06 (cc)  Cp = 0.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.12 | 60.99 | 0.89 |

Total solids  mass = 35.44 (gm)  density = 3.34 (gm/cc)
G = -543012.42 (J)  H = -427681.03 (J)  S = 81.61 (J/K)  V = 10.62 (cc)  Cp = 41.18 (J/K)

Viscosity of the System: 4.08 (log 10 poise)

System  mass = 100.03 (gm)  density = 2.84 (gm/cc)
G = -1581041.53 (J)  H = -1216610.37 (J)  S = 257.89 (J/K)  V = 35.23 (cc)  Cp = 132.32 (J/K)

Oxygen  delta moles = 0.000810024  delta grams = 0.0259198
G = -262.58 (J)  H = 30.31 (J)  S = 0.21 (J/K)  V = 95.17 (cc)  Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 1130.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.87  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 60.81 (gm)  density = 2.62 (gm/cc)  viscosity = 3.34 (log 10 poise)  (analysis in wt %)
G = -976788.45 (J)  H = -744104.91 (J)  S = 165.83 (J/K)  V = 23.24 (cc)  Cp = 85.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 54.93 | 1.33 | 19.87 | 1.31 | 0.00 | 6.97 | 0.30 | 1.78 | 0.00 | 0.00 | 5.81 | 4.19 | 1.45 | 0.40 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene  mass = 36.42 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.05Ca0.67Fe"0.34Mg0.70Fe'"0.08Ti0.03Al0.37Si1.77O6
G = -555162.89 (J)  H = -437925.49 (J)  S = 83.55 (J/K)  V = 10.88 (cc)  Cp = 42.23 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
10.00 28.55 33.62 14.79 -9.33 17.68 4.70

clinopyroxene mass = 0.35 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.27Fe"0.56Mg0.95Fe'"0.06Ti0.01Al0.30Si1.82O6
G = -5214.14 (J) H = -4061.51 (J) S = 0.82 (J/K) V = 0.10 (cc) Cp = 0.42 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-47.25 70.47 56.40 11.97 -9.95 16.11 2.23

feldspar mass = 2.44 (gm) density = 2.67 (gm/cc) (analysis in mole %)
K0.01Na0.40Ca0.59Al1.59Si2.41O8
G = -41291.09 (J) H = -33039.34 (J) S = 5.88 (J/K) V = 0.91 (cc) Cp = 2.99 (J/K)
albite anorthite sanidine
39.56 59.48 0.96

Total solids mass = 39.21 (gm) density = 3.30 (gm/cc)
G = -601668.12 (J) H = -475026.34 (J) S = 90.26 (J/K) V = 11.90 (cc) Cp = 45.63 (J/K)

Viscosity of the System: 4.32 (log 10 poise)

System mass = 100.03 (gm) density = 2.85 (gm/cc)
G = -1578456.57 (J) H = -1219131.24 (J) S = 256.08 (J/K) V = 35.14 (cc) Cp = 131.32 (J/K)

Oxygen delta moles = 0.000782556 delta grams = 0.0250409
G = -251.67 (J) H = 29.00 (J) S = 0.20 (J/K) V = 91.29 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 57.03 (gm) density = 2.61 (gm/cc) viscosity = 3.40 (log 10 poise) (analysis in wt %)
G = -915752.31 (J) H = -699228.65 (J) S = 155.42 (J/K) V = 21.86 (cc) Cp = 80.25 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
55.25 1.35 19.76 1.29 0.00 6.80 0.32 1.63 0.00 0.00 5.61 4.25 1.54 0.42 1.77 0.00 0.00 0.00 0.00

clinopyroxene mass = 35.34 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.68Fe"0.34Mg0.68Fe'"0.09Ti0.03Al0.38Si1.76O6
G = -536856.50 (J) H = -424449.34 (J) S = 80.69 (J/K) V = 10.54 (cc) Cp = 40.86 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
10.12 27.41 33.92 15.08 -8.98 17.55 4.90

clinopyroxene mass = 2.82 (gm) density = 3.39 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.26Fe"0.58Mg0.94Fe'"0.06Ti0.01Al0.30Si1.82O6
G = -41314.36 (J) H = -32231.41 (J) S = 6.52 (J/K) V = 0.83 (cc) Cp = 3.31 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-50.13 71.31 58.44 11.93 -9.85 16.05 2.25

feldspar mass = 4.84 (gm) density = 2.66 (gm/cc) (analysis in mole %)

K0.01Na0.41Ca0.58Al1.58Si2.42O8
G = -81958.03 (J) H = -65716.86 (J) S = 11.66 (J/K) V = 1.82 (cc) Cp = 5.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.80 | 58.17 | 1.04 |

Total solids mass = 43.00 (gm) density = 3.26 (gm/cc)
G = -660128.89 (J) H = -522397.60 (J) S = 98.86 (J/K) V = 13.19 (cc) Cp = 50.09 (J/K)

Viscosity of the System: 4.61 (log 10 poise)

System mass = 100.02 (gm) density = 2.85 (gm/cc)
G = -1575881.20 (J) H = -1221626.25 (J) S = 254.28 (J/K) V = 35.05 (cc) Cp = 130.34 (J/K)

Oxygen delta moles = 0.000739546 delta grams = 0.0236646
G = -235.95 (J) H = 27.14 (J) S = 0.19 (J/K) V = 85.66 (cc) Cp = 0.03 (J/K)

**********----------**********
Title: mafic

T = 1110.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.08 COH = 1.83 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 53.54 (gm) density = 2.60 (gm/cc) viscosity = 3.45 (log 10 poise) (analysis in wt %)
G = -859808.43 (J) H = -658070.12 (J) S = 145.85 (J/K) V = 20.59 (cc) Cp = 75.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.56 | 1.36 | 19.68 | 1.27 | 0.00 | 6.60 | 0.34 | 1.50 | 0.00 | 0.00 | 5.42 | 4.30 | 1.63 | 0.45 | 1.89 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 34.42 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.69Fe"0.34Mg0.66Fe'"0.09Ti0.03Al0.38Si1.76O6
G = -521334.52 (J) H = -413133.74 (J) S = 78.23 (J/K) V = 10.25 (cc) Cp = 39.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 10.30 | 26.27 | 34.15 | 15.42 | -8.62 | 17.39 | 5.10 |

clinopyroxene mass = 5.00 (gm) density = 3.40 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.26Fe"0.60Mg0.92Fe'"0.06Ti0.01Al0.30Si1.82O6
G = -72930.95 (J) H = -56988.57 (J) S = 11.53 (J/K) V = 1.47 (cc) Cp = 5.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.90 | 72.13 | 60.41 | 11.89 | -9.76 | 15.98 | 2.25 |

feldspar mass = 7.06 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.42Ca0.57Al1.57Si2.43O8
G = -119246.10 (J) H = -95817.31 (J) S = 16.94 (J/K) V = 2.65 (cc) Cp = 8.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.97 | 56.91 | 1.11 |

Total solids mass = 46.48 (gm) density = 3.23 (gm/cc)
G = -713511.57 (J) H = -565939.62 (J) S = 106.69 (J/K) V = 14.37 (cc) Cp = 54.17 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 100.02 (gm) density = 2.86 (gm/cc)
G = -1573320.01 (J) H = -1224009.74 (J) S = 252.55 (J/K) V = 34.96 (cc) Cp = 129.44 (J/K)

Oxygen delta moles = 0.000690058 delta grams = 0.022081
G = -218.40 (J) H = 25.07 (J) S = 0.18 (J/K) V = 79.36 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1100.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.81 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 50.33 (gm) density = 2.59 (gm/cc) viscosity = 3.51 (log 10 poise) (analysis in wt %)
G = -808421.71 (J) H = -620234.11 (J) S = 137.05 (J/K) V = 19.42 (cc) Cp = 70.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.88 | 1.36 | 19.60 | 1.24 | 0.00 | 6.38 | 0.36 | 1.38 | 0.00 | 0.00 | 5.24 | 4.34 | 1.73 | 0.48 | 2.01 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 33.64 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.70Fe"0.34Mg0.65Fe'"0.09Ti0.04Al0.38Si1.75O6
G = -508100.92 (J) H = -403597.65 (J) S = 76.10 (J/K) V = 10.00 (cc) Cp = 38.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 10.52 | 25.15 | 34.30 | 15.80 | -8.25 | 17.20 | 5.29 |

clinopyroxene mass = 6.95 (gm) density = 3.41 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.25Fe"0.62Mg0.91Fe'"0.06Ti0.01Al0.30Si1.82O6
G = -100707.36 (J) H = -78824.45 (J) S = 15.94 (J/K) V = 2.04 (cc) Cp = 8.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.56 | 72.93 | 62.31 | 11.84 | -9.68 | 15.90 | 2.25 |

feldspar mass = 9.10 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.43Ca0.56Al1.56Si2.44O8
G = -153541.96 (J) H = -123636.18 (J) S = 21.78 (J/K) V = 3.42 (cc) Cp = 11.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 43.08 | 55.72 | 1.19 |

Total solids mass = 49.69 (gm) density = 3.21 (gm/cc)
G = -762350.24 (J) H = -606058.29 (J) S = 113.82 (J/K) V = 15.46 (cc) Cp = 57.92 (J/K)

Viscosity of the System: 5.40 (log 10 poise)

System mass = 100.02 (gm) density = 2.87 (gm/cc)
G = -1570771.96 (J) H = -1226292.39 (J) S = 250.87 (J/K) V = 34.88 (cc) Cp = 128.61 (J/K)

Oxygen delta moles = 0.000633299 delta grams = 0.0202648
G = -198.82 (J) H = 22.78 (J) S = 0.16 (J/K) V = 72.30 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW

= 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 47.37 (gm) density = 2.58 (gm/cc) viscosity = 3.56 (log 10 poise) (analysis in wt %)
G = -761148.13 (J) H = -585393.62 (J) S = 128.93 (J/K) V = 18.35 (cc) Cp = 66.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.20 | 1.36 | 19.53 | 1.20 | 0.00 | 6.14 | 0.38 | 1.27 | 0.00 | 0.00 | 5.07 | 4.37 | 1.82 | 0.51 | 2.13 | 0.00 | 0.00 | 0.00 | 0.00 |

clinopyroxene mass = 32.98 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.05Ca0.70Fe"0.34Mg0.63Fe'"0.09Ti0.04Al0.39Si1.75O6
G = -496744.11 (J) H = -395523.86 (J) S = 74.25 (J/K) V = 9.79 (cc) Cp = 37.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 10.79 | 24.04 | 34.39 | 16.21 | -7.88 | 16.98 | 5.47 |

clinopyroxene mass = 8.68 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.24Fe"0.64Mg0.90Fe'"0.06Ti0.01Al0.30Si1.82O6
G = -125169.70 (J) H = -98140.98 (J) S = 19.83 (J/K) V = 2.54 (cc) Cp = 10.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.08 | 73.71 | 64.14 | 11.78 | -9.61 | 15.81 | 2.25 |

feldspar mass = 10.99 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.44Ca0.55Al1.55Si2.45O8
G = -185174.23 (J) H = -149424.45 (J) S = 26.23 (J/K) V = 4.13 (cc) Cp = 13.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 44.13 | 54.59 | 1.27 |

Total solids mass = 52.65 (gm) density = 3.20 (gm/cc)
G = -807088.04 (J) H = -643089.30 (J) S = 120.31 (J/K) V = 16.46 (cc) Cp = 61.36 (J/K)

Viscosity of the System: 6.10 (log 10 poise)

System mass = 100.02 (gm) density = 2.87 (gm/cc)
G = -1568236.18 (J) H = -1228482.92 (J) S = 249.24 (J/K) V = 34.81 (cc) Cp = 127.84 (J/K)

Oxygen delta moles = 0.00056865 delta grams = 0.0181961
G = -177.08 (J) H = 20.25 (J) S = 0.14 (J/K) V = 64.45 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1080.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.06 COH = 1.76 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 44.80 (gm) density = 2.57 (gm/cc) viscosity = 3.63 (log 10 poise) (analysis in wt %)
G = -720445.83 (J) H = -555525.05 (J) S = 121.88 (J/K) V = 17.42 (cc) Cp = 62.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 56.67 | 1.34 | 19.39 | 1.16 | 0.00 | 5.84 | 0.41 | 1.17 | 0.00 | 0.00 | 4.90 | 4.41 | 1.92 | 0.54 | 2.25 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.02 (gm) density = 3.81 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.44Mg0.38)3Al2Si3O12
G = -15036.17 (J) H = -11993.59 (J) S = 2.25 (J/K) V = 0.27 (cc) Cp = 1.16 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 44.30 | 17.21 | 38.49 |

clinopyroxene mass = 32.76 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.71Fe"0.34Mg0.62Fe'"0.09Ti0.05Al0.39Si1.74O6
G = -492319.79 (J) H = -392970.19 (J) S = 73.42 (J/K) V = 9.71 (cc) Cp = 37.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 11.28 | 23.02 | 34.40 | 16.50 | -7.41 | 16.56 | 5.66 |

clinopyroxene mass = 9.19 (gm) density = 3.42 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.23Fe"0.66Mg0.90Fe'"0.06Ti0.01Al0.29Si1.82O6
G = -131900.23 (J) H = -103612.49 (J) S = 20.91 (J/K) V = 2.69 (cc) Cp = 10.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.15 | 74.44 | 65.76 | 11.60 | -9.44 | 15.54 | 2.25 |

feldspar mass = 12.25 (gm) density = 2.66 (gm/cc) (analysis in mole %)
K0.01Na0.46Ca0.53Al1.53Si2.47O8
G = -205971.21 (J) H = -166549.68 (J) S = 29.13 (J/K) V = 4.61 (cc) Cp = 14.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.54 | 53.10 | 1.37 |

Total solids mass = 55.22 (gm) density = 3.20 (gm/cc)
G = -845227.41 (J) H = -675125.96 (J) S = 125.71 (J/K) V = 17.27 (cc) Cp = 64.28 (J/K)

Viscosity of the System: 8.37 (log 10 poise)

System mass = 100.01 (gm) density = 2.88 (gm/cc)
G = -1565673.24 (J) H = -1230651.01 (J) S = 247.59 (J/K) V = 34.69 (cc) Cp = 127.09 (J/K)

Oxygen delta moles = 0.000424287 delta grams = 0.0135767
G = -131.04 (J) H = 14.95 (J) S = 0.11 (J/K) V = 47.73 (cc) Cp = 0.02 (J/K)

**********----------**********
Title: mafic

T = 1070.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.05 COH = 1.74 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 42.75 (gm) density = 2.56 (gm/cc) viscosity = 3.73 (log 10 poise) (analysis in wt %)
G = -688559.70 (J) H = -532442.92 (J) S = 116.23 (J/K) V = 16.71 (cc) Cp = 59.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 57.46 | 1.32 | 19.04 | 1.09 | 0.00 | 5.42 | 0.43 | 1.08 | 0.00 | 0.00 | 4.72 | 4.51 | 2.00 | 0.57 | 2.36 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.02 (gm) density = 3.81 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.45Mg0.38)3Al2Si3O12
G = -58821.78 (J) H = -47017.10 (J) S = 8.79 (J/K) V = 1.05 (cc) Cp = 4.55 (J/K)

almandine grossular pyrope
44.96 17.11 37.93

clinopyroxene mass = 33.21 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.72Fe"0.34Mg0.61Fe'"0.09Ti0.05Al0.38Si1.75O6
G = -498396.41 (J) H = -398847.06 (J) S = 74.12 (J/K) V = 9.84 (cc) Cp = 37.96 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
12.21 22.14 34.33 16.46 -6.77 15.77 5.86

clinopyroxene mass = 7.59 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.23Fe"0.67Mg0.90Fe'"0.06Ti0.01Al0.28Si1.83O6
G = -108559.06 (J) H = -85458.36 (J) S = 17.20 (J/K) V = 2.22 (cc) Cp = 8.81 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-61.42 75.12 67.01 11.17 -9.05 14.91 2.25

feldspar mass = 12.43 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.01Na0.48Ca0.51Al1.51Si2.49O8
G = -208710.71 (J) H = -169091.12 (J) S = 29.50 (J/K) V = 4.68 (cc) Cp = 15.15 (J/K)
albite anorthite sanidine
47.74 50.76 1.49

Total solids mass = 57.26 (gm) density = 3.22 (gm/cc)
G = -874487.96 (J) H = -700413.64 (J) S = 129.60 (J/K) V = 17.79 (cc) Cp = 66.48 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.00 (gm) density = 2.90 (gm/cc)
G = -1563047.66 (J) H = -1232856.56 (J) S = 245.83 (J/K) V = 34.50 (cc) Cp = 126.32 (J/K)

Oxygen delta moles = 0.00013259 delta grams = 0.00424273
G = -40.61 (J) H = 4.63 (J) S = 0.03 (J/K) V = 14.81 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: mafic

T = 1060.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.04 COH = 1.72 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 40.80 (gm) density = 2.55 (gm/cc) viscosity = 3.83 (log 10 poise) (analysis in wt %)
G = -658072.71 (J) H = -510285.31 (J) S = 110.86 (J/K) V = 16.03 (cc) Cp = 57.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 58.25 | 1.30 | 18.71 | 1.03 | 0.00 | 5.03 | 0.45 | 0.99 | 0.00 | 0.00 | 4.51 | 4.60 | 2.09 | 0.56 | 2.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.68 (gm) density = 3.82 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.46Mg0.37)3Al2Si3O12
G = -97308.50 (J) H = -77944.66 (J) S = 14.52 (J/K) V = 1.75 (cc) Cp = 7.55 (J/K)
almandine grossular pyrope
45.57 17.01 37.42

clinopyroxene mass = 33.52 (gm) density = 3.38 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.73Fe"0.34Mg0.61Fe'"0.09Ti0.05Al0.37Si1.75O6
G = -502266.47 (J) H = -402990.75 (J) S = 74.47 (J/K) V = 9.93 (cc) Cp = 38.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 13.17 | 21.29 | 34.21 | 16.44 | -6.15 | 14.99 | 6.06 |

clinopyroxene mass = 6.28 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.22Fe"0.68Mg0.90Fe'"0.06Ti0.01Al0.27Si1.84O6
G = -89377.77 (J) H = -70512.52 (J) S = 14.15 (J/K) V = 1.83 (cc) Cp = 7.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.55 | 75.77 | 68.16 | 10.75 | -8.67 | 14.29 | 2.25 |

feldspar mass = 12.70 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.50Ca0.49Al1.49Si2.51O8
G = -213005.41 (J) H = -172908.22 (J) S = 30.08 (J/K) V = 4.79 (cc) Cp = 15.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 49.82 | 48.56 | 1.62 |

apatite mass = 0.03 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -415.75 (J) H = -331.70 (J) S = 0.06 (J/K) V = 0.01 (cc) Cp = 0.03 (J/K)

Total solids mass = 59.20 (gm) density = 3.23 (gm/cc)
G = -902373.90 (J) H = -724687.85 (J) S = 133.28 (J/K) V = 18.31 (cc) Cp = 68.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 100.00 (gm) density = 2.91 (gm/cc)
G = -1560446.61 (J) H = -1234973.17 (J) S = 244.14 (J/K) V = 34.33 (cc) Cp = 125.60 (J/K)

Oxygen delta moles = -0.000146064 delta grams = -0.00467389
G = 44.37 (J) H = -5.04 (J) S = -0.04 (J/K) V = -16.19 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: mafic

T = 1050.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.04 COH = 1.70 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 38.96 (gm) density = 2.53 (gm/cc) viscosity = 3.92 (log 10 poise) (analysis in wt %)
G = -629373.12 (J) H = -489369.32 (J) S = 105.81 (J/K) V = 15.38 (cc) Cp = 54.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.03 | 1.28 | 18.40 | 0.97 | 0.00 | 4.65 | 0.47 | 0.92 | 0.00 | 0.00 | 4.30 | 4.67 | 2.18 | 0.55 | 2.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 9.05 (gm) density = 3.82 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.46Mg0.37)3Al2Si3O12
G = -131457.51 (J) H = -105523.74 (J) S = 19.60 (J/K) V = 2.37 (cc) Cp = 10.21 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 46.14 | 16.91 | 36.95 |

clinopyroxene mass = 33.73 (gm) density = 3.38 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.73Fe"0.34Mg0.61Fe'"0.09Ti0.05Al0.37Si1.75O6
G = -504759.88 (J) H = -406053.55 (J) S = 74.60 (J/K) V = 9.98 (cc) Cp = 38.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 14.15 | 20.48 | 34.04 | 16.43 | -5.56 | 14.21 | 6.24 |

clinopyroxene mass = 5.15 (gm) density = 3.43 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.69Mg0.90Fe'"0.05Ti0.01Al0.26Si1.84O6
G = -73089.54 (J) H = -57791.69 (J) S = 11.56 (J/K) V = 1.50 (cc) Cp = 5.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.55 | 76.39 | 69.20 | 10.34 | -8.31 | 13.68 | 2.25 |

feldspar mass = 13.03 (gm) density = 2.65 (gm/cc) (analysis in mole %)
K0.02Na0.52Ca0.46Al1.46Si2.54O8
G = -218200.35 (J) H = -177475.66 (J) S = 30.78 (J/K) V = 4.92 (cc) Cp = 15.87 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 51.77 | 46.47 | 1.76 |

apatite mass = 0.07 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -989.29 (J) H = -791.26 (J) S = 0.15 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

Total solids mass = 61.02 (gm) density = 3.25 (gm/cc)
G = -928496.56 (J) H = -747635.89 (J) S = 136.69 (J/K) V = 18.80 (cc) Cp = 70.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.99 (gm) density = 2.93 (gm/cc)
G = -1557869.69 (J) H = -1237005.20 (J) S = 242.50 (J/K) V = 34.18 (cc) Cp = 124.92 (J/K)

Oxygen delta moles = -0.000411318 delta grams = -0.0131617
G = 123.90 (J) H = -14.05 (J) S = -0.10 (J/K) V = -45.25 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: mafic

T = 1040.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.03 COH = 1.67 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 37.27 (gm) density = 2.52 (gm/cc) viscosity = 4.01 (log 10 poise) (analysis in wt %)
G = -602734.16 (J) H = -469924.88 (J) S = 101.14 (J/K) V = 14.78 (cc) Cp = 51.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 59.78 | 1.25 | 18.08 | 0.91 | 0.00 | 4.30 | 0.49 | 0.85 | 0.00 | 0.00 | 4.11 | 4.73 | 2.26 | 0.54 | 2.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.19 (gm) density = 3.83 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.47Mg0.37)3Al2Si3O12
G = -162048.09 (J) H = -130361.14 (J) S = 24.13 (J/K) V = 2.92 (cc) Cp = 12.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 46.66 | 16.80 | 36.54 |

clinopyroxene mass = 33.88 (gm) density = 3.38 (gm/cc) (analysis in mole %)

cpx Na0.06Ca0.74Fe"0.34Mg0.60Fe'"0.08Ti0.06Al0.36Si1.75O6
G = -506470.34 (J) H = -408503.93 (J) S = 74.60 (J/K) V = 10.02 (cc) Cp = 38.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 15.14 | 19.72 | 33.84 | 16.43 | -5.00 | 13.45 | 6.42 |

clinopyroxene mass = 4.15 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.21Fe"0.70Mg0.91Fe'"0.05Ti0.01Al0.25Si1.85O6
G = -58772.22 (J) H = -46577.85 (J) S = 9.29 (J/K) V = 1.21 (cc) Cp = 4.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.43 | 77.00 | 70.14 | 9.94 | -7.97 | 13.08 | 2.24 |

feldspar mass = 13.39 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.02Na0.54Ca0.44Al1.44Si2.56O8
G = -223801.16 (J) H = -182395.62 (J) S = 31.53 (J/K) V = 5.06 (cc) Cp = 16.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 53.60 | 44.49 | 1.90 |

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1490.53 (J) H = -1195.12 (J) S = 0.22 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

Total solids mass = 62.71 (gm) density = 3.26 (gm/cc)
G = -952582.34 (J) H = -769033.65 (J) S = 139.78 (J/K) V = 19.25 (cc) Cp = 72.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.98 (gm) density = 2.94 (gm/cc)
G = -1555316.51 (J) H = -1238958.53 (J) S = 240.92 (J/K) V = 34.03 (cc) Cp = 124.40 (J/K)

Oxygen delta moles = -0.000662835 delta grams = -0.0212099
G = 197.99 (J) H = -22.41 (J) S = -0.17 (J/K) V = -72.37 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: mafic

T = 1030.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.02 COH = 1.65 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 35.70 (gm) density = 2.51 (gm/cc) viscosity = 4.10 (log 10 poise) (analysis in wt %)
G = -577989.53 (J) H = -451836.99 (J) S = 96.81 (J/K) V = 14.22 (cc) Cp = 49.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.49 | 1.22 | 17.77 | 0.86 | 0.00 | 3.97 | 0.51 | 0.79 | 0.00 | 0.00 | 3.93 | 4.78 | 2.35 | 0.53 | 2.82 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.14 (gm) density = 3.83 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.47Mg0.36)3Al2Si3O12
G = -189589.90 (J) H = -152850.82 (J) S = 28.19 (J/K) V = 3.43 (cc) Cp = 14.77 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 47.15 | 16.69 | 36.16 |

clinopyroxene mass = 33.99 (gm) density = 3.38 (gm/cc) (analysis in mole %)

cpx Na0.07Ca0.74Fe"0.34Mg0.60Fe'"0.08Ti0.06Al0.36Si1.75O6
G = -507674.81 (J) H = -410559.33 (J) S = 74.52 (J/K) V = 10.06 (cc) Cp = 38.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.14 | 18.99 | 33.61 | 16.43 | -4.46 | 12.70 | 6.59 |

clinopyroxene mass = 3.26 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.71Mg0.91Fe'"0.05Ti0.01Al0.24Si1.86O6
G = -45983.50 (J) H = -36528.14 (J) S = 7.26 (J/K) V = 0.95 (cc) Cp = 3.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.19 | 77.57 | 70.99 | 9.55 | -7.64 | 12.49 | 2.23 |

feldspar mass = 13.76 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.02Na0.55Ca0.43Al1.43Si2.57O8
G = -229619.24 (J) H = -187515.69 (J) S = 32.31 (J/K) V = 5.21 (cc) Cp = 16.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 55.33 | 42.63 | 2.05 |

apatite mass = 0.13 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1929.25 (J) H = -1550.71 (J) S = 0.29 (J/K) V = 0.04 (cc) Cp = 0.15 (J/K)

Total solids mass = 64.27 (gm) density = 3.27 (gm/cc)
G = -974796.70 (J) H = -789004.69 (J) S = 142.57 (J/K) V = 19.68 (cc) Cp = 74.19 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.97 (gm) density = 2.95 (gm/cc)
G = -1552786.23 (J) H = -1240841.68 (J) S = 239.38 (J/K) V = 33.90 (cc) Cp = 123.83 (J/K)

Oxygen delta moles = -0.000901199 delta grams = -0.0288373
G = 266.91 (J) H = -30.14 (J) S = -0.23 (J/K) V = -97.64 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: mafic

T = 1020.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.01 COH = 1.63 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 34.29 (gm) density = 2.50 (gm/cc) viscosity = 4.18 (log 10 poise) (analysis in wt %)
G = -555598.26 (J) H = -435466.26 (J) S = 92.90 (J/K) V = 13.71 (cc) Cp = 47.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.19 | 1.18 | 17.43 | 0.81 | 0.00 | 3.68 | 0.53 | 0.73 | 0.00 | 0.00 | 3.75 | 4.82 | 2.43 | 0.52 | 2.94 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 15.06 (gm) density = 3.84 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.48Mg0.36)3Al2Si3O12
G = -216664.50 (J) H = -175052.77 (J) S = 32.18 (J/K) V = 3.92 (cc) Cp = 16.91 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 47.72 | 16.60 | 35.67 |

orthopyroxene mass = 1.60 (gm) density = 3.45 (gm/cc) (analysis in mole %)

opx Na0.01Ca0.05Fe"0.74Mg1.09Fe'''0.03Ti0.00Al0.17Si1.90O6
G = -22555.39 (J) H = -17986.03 (J) S = 3.53 (J/K) V = 0.46 (cc) Cp = 1.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.03 | 94.02 | 74.16 | 7.35 | -6.52 | 9.50 | 0.53 |

clinopyroxene mass = 34.53 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.75Fe"0.34Mg0.60Fe'''0.08Ti0.06Al0.35Si1.76O6
G = -515053.26 (J) H = -417587.64 (J) S = 75.37 (J/K) V = 10.21 (cc) Cp = 39.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 16.94 | 18.36 | 33.55 | 16.34 | -3.95 | 12.00 | 6.77 |

clinopyroxene mass = 0.23 (gm) density = 3.44 (gm/cc) (analysis in mole %)
cpx Na0.02Ca0.20Fe"0.72Mg0.91Fe'''0.05Ti0.01Al0.23Si1.86O6
G = -3291.20 (J) H = -2620.32 (J) S = 0.52 (J/K) V = 0.07 (cc) Cp = 0.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.15 | 78.11 | 72.03 | 9.15 | -7.32 | 11.95 | 2.22 |

feldspar mass = 14.09 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.02Na0.57Ca0.41Al1.41Si2.59O8
G = -234806.78 (J) H = -192141.63 (J) S = 32.99 (J/K) V = 5.34 (cc) Cp = 17.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 56.99 | 40.81 | 2.20 |

apatite mass = 0.15 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2310.60 (J) H = -1861.80 (J) S = 0.35 (J/K) V = 0.05 (cc) Cp = 0.18 (J/K)

Total solids mass = 65.67 (gm) density = 3.27 (gm/cc)
G = -994681.73 (J) H = -807250.19 (J) S = 144.94 (J/K) V = 20.06 (cc) Cp = 75.71 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.96 (gm/cc)
G = -1550279.99 (J) H = -1242716.45 (J) S = 237.84 (J/K) V = 33.77 (cc) Cp = 123.32 (J/K)

Oxygen delta moles = -0.0011235 delta grams = -0.0359505
G = 329.91 (J) H = -37.17 (J) S = -0.28 (J/K) V = -120.79 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: mafic

T = 1010.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.00 COH = 1.60 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 32.80 (gm) density = 2.49 (gm/cc) viscosity = 4.24 (log 10 poise) (analysis in wt %)
G = -531866.80 (J) H = -417927.67 (J) S = 88.80 (J/K) V = 13.17 (cc) Cp = 45.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61.78 | 1.14 | 17.17 | 0.75 | 0.00 | 3.38 | 0.55 | 0.68 | 0.00 | 0.00 | 3.61 | 4.83 | 2.52 | 0.51 | 3.07 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 16.24 (gm) density = 3.84 (gm/cc) (analysis in mole %)

(Ca0.17Fe"0.48Mg0.35)3Al2Si3O12
G = -232873.37 (J) H = -188566.14 (J) S = 34.53 (J/K) V = 4.23 (cc) Cp = 18.20 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 48.17 | 16.61 | 35.22 |

orthopyroxene mass = 1.79 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.75Mg1.09Fe'"0.03Ti0.00Al0.17Si1.90O6
G = -25147.71 (J) H = -20101.35 (J) S = 3.93 (J/K) V = 0.52 (cc) Cp = 2.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.43 | 94.10 | 74.83 | 7.14 | -6.35 | 9.18 | 0.53 |

clinopyroxene mass = 34.20 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.76Fe"0.33Mg0.59Fe'"0.08Ti0.07Al0.35Si1.76O6
G = -509740.94 (J) H = -414411.40 (J) S = 74.29 (J/K) V = 10.11 (cc) Cp = 38.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 18.25 | 17.34 | 33.10 | 16.52 | -3.48 | 11.36 | 6.92 |

feldspar mass = 14.75 (gm) density = 2.64 (gm/cc) (analysis in mole %)
K0.02Na0.58Ca0.39Al1.39Si2.61O8
G = -245476.64 (J) H = -201293.85 (J) S = 34.43 (J/K) V = 5.59 (cc) Cp = 18.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 58.21 | 39.44 | 2.35 |

rhm-oxide mass = 0.00 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.61Mg0.15Fe'"0.19Al0.20Ti0.80O3
G = -16.84 (J) H = -12.68 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.96 | 9.61 | 60.75 | 4.70 | 9.97 |

apatite mass = 0.18 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2681.22 (J) H = -2165.75 (J) S = 0.40 (J/K) V = 0.06 (cc) Cp = 0.21 (J/K)

Total solids mass = 67.16 (gm) density = 3.27 (gm/cc)
G = -1015936.72 (J) H = -826551.17 (J) S = 147.59 (J/K) V = 20.51 (cc) Cp = 77.35 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.96 (gm) density = 2.97 (gm/cc)
G = -1547803.52 (J) H = -1244478.84 (J) S = 236.39 (J/K) V = 33.68 (cc) Cp = 122.83 (J/K)

Oxygen delta moles = -0.00131894 delta grams = -0.0422044
G = 383.97 (J) H = -43.16 (J) S = -0.33 (J/K) V = -140.71 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: mafic

T = 1000.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = -0.00 COH = 1.58
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 31.36 (gm) density = 2.48 (gm/cc) viscosity = 4.31 (log 10 poise) (analysis in wt %)
G = -508935.63 (J) H = -400922.86 (J) S = 84.84 (J/K) V = 12.64 (cc) Cp = 43.42 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
62.37 1.08 16.93 0.70 0.00 3.09 0.57 0.64 0.00 0.00 3.48 4.83 2.62 0.50 3.21 0.00 0.00 0.00 0.00

garnet mass = 17.35 (gm) density = 3.85 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.49Mg0.35)3Al2Si3O12
G = -248084.72 (J) H = -201340.26 (J) S = 36.72 (J/K) V = 4.51 (cc) Cp = 19.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 48.50 | 16.65 | 34.85 |

orthopyroxene mass = 1.57 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.75Mg1.09Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -21996.32 (J) H = -17626.72 (J) S = 3.43 (J/K) V = 0.45 (cc) Cp = 1.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.52 | 94.16 | 75.23 | 6.92 | -6.18 | 8.86 | 0.53 |

clinopyroxene mass = 33.93 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.76Fe"0.33Mg0.60Fe'"0.08Ti0.06Al0.34Si1.76O6
G = -505488.99 (J) H = -412067.60 (J) S = 73.38 (J/K) V = 10.03 (cc) Cp = 38.47 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 19.64 | 16.69 | 32.78 | 16.24 | -3.25 | 10.86 | 7.05 |

feldspar mass = 15.45 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.02Na0.59Ca0.38Al1.38Si2.62O8
G = -256762.54 (J) H = -210993.84 (J) S = 35.95 (J/K) V = 5.86 (cc) Cp = 18.89 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 59.29 | 38.21 | 2.49 |

rhm-oxide mass = 0.10 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.61Mg0.15Fe'"0.19Al0.19Ti0.81O3
G = -1054.77 (J) H = -797.10 (J) S = 0.20 (J/K) V = 0.02 (cc) Cp = 0.10 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.98 | 9.34 | 61.12 | 4.95 | 9.61 |

apatite mass = 0.20 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3021.75 (J) H = -2446.81 (J) S = 0.45 (J/K) V = 0.07 (cc) Cp = 0.23 (J/K)

Total solids mass = 68.60 (gm) density = 3.27 (gm/cc)
G = -1036409.09 (J) H = -845272.33 (J) S = 150.13 (J/K) V = 20.95 (cc) Cp = 78.94 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.98 (gm/cc)
G = -1545344.72 (J) H = -1246195.20 (J) S = 234.97 (J/K) V = 33.59 (cc) Cp = 122.36 (J/K)

Oxygen delta moles = -0.00150844 delta grams = -0.0482683
G = 435.34 (J) H = -48.82 (J) S = -0.38 (J/K) V = -159.67 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: mafic

T = 990.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = -0.01 COH = 1.55

IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 30.04 (gm) density = 2.47 (gm/cc) viscosity = 4.37 (log 10 poise) (analysis in wt %)
G = -487896.74 (J) H = -385312.78 (J) S = 81.21 (J/K) V = 12.16 (cc) Cp = 41.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.92 | 1.02 | 16.69 | 0.65 | 0.00 | 2.82 | 0.59 | 0.59 | 0.00 | 0.00 | 3.35 | 4.81 | 2.71 | 0.49 | 3.35 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 18.39 (gm) density = 3.85 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.49Mg0.35)3Al2Si3O12
G = -262318.52 (J) H = -213378.49 (J) S = 38.74 (J/K) V = 4.78 (cc) Cp = 20.55 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 48.82 | 16.67 | 34.51 |

orthopyroxene mass = 1.33 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.76Mg1.09Fe'"0.03Ti0.00Al0.16Si1.91O6
G = -18651.94 (J) H = -14984.83 (J) S = 2.90 (J/K) V = 0.38 (cc) Cp = 1.56 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.55 | 94.23 | 75.55 | 6.71 | -6.01 | 8.54 | 0.53 |

clinopyroxene mass = 33.68 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.77Fe"0.32Mg0.60Fe'"0.07Ti0.06Al0.34Si1.77O6
G = -501660.48 (J) H = -410053.37 (J) S = 72.52 (J/K) V = 9.96 (cc) Cp = 38.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 21.03 | 16.08 | 32.43 | 15.98 | -3.04 | 10.36 | 7.16 |

feldspar mass = 16.10 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.60Ca0.37Al1.37Si2.63O8
G = -267088.77 (J) H = -219944.90 (J) S = 37.32 (J/K) V = 6.11 (cc) Cp = 19.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 60.32 | 37.03 | 2.65 |

rhm-oxide mass = 0.19 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.05Fe"0.61Mg0.15Fe'"0.18Al0.19Ti0.82O3
G = -1971.57 (J) H = -1494.64 (J) S = 0.38 (J/K) V = 0.04 (cc) Cp = 0.18 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.99 | 9.07 | 61.47 | 5.19 | 9.28 |

apatite mass = 0.22 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3315.64 (J) H = -2691.35 (J) S = 0.49 (J/K) V = 0.07 (cc) Cp = 0.26 (J/K)

Total solids mass = 69.91 (gm) density = 3.27 (gm/cc)
G = -1055006.92 (J) H = -862547.59 (J) S = 152.36 (J/K) V = 21.35 (cc) Cp = 80.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.95 (gm) density = 2.98 (gm/cc)
G = -1542903.66 (J) H = -1247860.37 (J) S = 233.58 (J/K) V = 33.51 (cc) Cp = 121.93 (J/K)

Oxygen delta moles = -0.00169139 delta grams = -0.0541224

G = 483.87 (J)  H = -54.13 (J)  S = -0.43 (J/K)  V = -177.63 (cc)  Cp = -0.06 (J/K)

**********_____**********
Title: mafic

T = 980.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = -0.02  COH = 1.53
IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 28.83 (gm)  density = 2.46 (gm/cc)  viscosity = 4.42 (log 10 poise)  (analysis in wt %)
G = -468523.74 (J)  H = -370931.13 (J)  S = 77.88 (J/K)  V = 11.71 (cc)  Cp = 39.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.44 | 0.97 | 16.46 | 0.60 | 0.00 | 2.58 | 0.61 | 0.56 | 0.00 | 0.00 | 3.23 | 4.79 | 2.80 | 0.49 | 3.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.37 (gm)  density = 3.85 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.49Mg0.34)3Al2Si3O12
G = -275673.81 (J)  H = -224756.20 (J)  S = 40.63 (J/K)  V = 5.03 (cc)  Cp = 21.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 49.11 | 16.69 | 34.20 |

orthopyroxene mass = 1.08 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.01Ca0.05Fe"0.76Mg1.09Fe'"0.02Ti0.00Al0.15Si1.91O6
G = -15156.11 (J)  H = -12207.65 (J)  S = 2.35 (J/K)  V = 0.31 (cc)  Cp = 1.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.53 | 94.30 | 75.80 | 6.51 | -5.85 | 8.23 | 0.53 |

clinopyroxene mass = 33.46 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.77Fe"0.32Mg0.60Fe'"0.07Ti0.06Al0.33Si1.77O6
G = -498210.75 (J)  H = -408334.05 (J)  S = 71.72 (J/K)  V = 9.90 (cc)  Cp = 37.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 22.41 | 15.50 | 32.06 | 15.71 | -2.84 | 9.88 | 7.28 |

feldspar mass = 16.69 (gm)  density = 2.63 (gm/cc)  (analysis in mole %)
K0.03Na0.61Ca0.36Al1.36Si2.64O8
G = -276558.74 (J)  H = -228227.42 (J)  S = 38.57 (J/K)  V = 6.34 (cc)  Cp = 20.38 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 61.30 | 35.90 | 2.80 |

rhm-oxide mass = 0.27 (gm)  density = 4.56 (gm/cc)  (analysis in mole %)
Mn0.05Fe"0.62Mg0.15Fe'"0.18Al0.18Ti0.82O3
G = -2787.31 (J)  H = -2119.77 (J)  S = 0.53 (J/K)  V = 0.06 (cc)  Cp = 0.26 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.02 | 8.80 | 61.81 | 5.42 | 8.96 |

apatite mass = 0.24 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3569.69 (J)  H = -2904.64 (J)  S = 0.53 (J/K)  V = 0.08 (cc)  Cp = 0.28 (J/K)

Total solids mass = 71.11 (gm)  density = 3.27 (gm/cc)
G = -1071956.42 (J)  H = -878549.73 (J)  S = 154.34 (J/K)  V = 21.72 (cc)  Cp = 81.69 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.94 (gm) density = 2.99 (gm/cc)
G = -1540480.16 (J) H = -1249480.86 (J) S = 232.21 (J/K) V = 33.43 (cc) Cp = 121.52 (J/K)

Oxygen delta moles = -0.00186751 delta grams = -0.059758
G = 529.56 (J) H = -59.10 (J) S = -0.47 (J/K) V = -194.58 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: mafic

T = 970.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = -0.03 COH = 1.50 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 27.71 (gm) density = 2.45 (gm/cc) viscosity = 4.47 (log 10 poise) (analysis in wt %)
G = -450623.51 (J) H = -357636.01 (J) S = 74.80 (J/K) V = 11.29 (cc) Cp = 38.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.94 | 0.92 | 16.23 | 0.55 | 0.00 | 2.35 | 0.62 | 0.52 | 0.00 | 0.00 | 3.12 | 4.77 | 2.88 | 0.48 | 3.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 20.31 (gm) density = 3.86 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.49Mg0.34)3Al2Si3O12
G = -288235.02 (J) H = -235537.46 (J) S = 42.39 (J/K) V = 5.27 (cc) Cp = 22.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 49.38 | 16.71 | 33.91 |

orthopyroxene mass = 0.83 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.76Mg1.10Fe'''0.02Ti0.00Al0.15Si1.91O6
G = -11544.93 (J) H = -9323.10 (J) S = 1.79 (J/K) V = 0.24 (cc) Cp = 0.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.45 | 94.37 | 76.00 | 6.31 | -5.69 | 7.93 | 0.53 |

clinopyroxene mass = 33.25 (gm) density = 3.38 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.78Fe"0.32Mg0.60Fe'''0.07Ti0.06Al0.32Si1.78O6
G = -495100.35 (J) H = -406879.04 (J) S = 70.97 (J/K) V = 9.85 (cc) Cp = 37.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 23.79 | 14.95 | 31.67 | 15.45 | -2.65 | 9.41 | 7.38 |

feldspar mass = 17.24 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.62Ca0.35Al1.35Si2.65O8
G = -285262.84 (J) H = -235911.67 (J) S = 39.70 (J/K) V = 6.56 (cc) Cp = 21.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 62.24 | 34.81 | 2.95 |

rhm-oxide mass = 0.34 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.62Mg0.15Fe'''0.17Al0.17Ti0.83O3
G = -3517.98 (J) H = -2683.98 (J) S = 0.67 (J/K) V = 0.07 (cc) Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.04 | 8.52 | 62.13 | 5.65 | 8.66 |

apatite mass = 0.26 (gm) density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -3789.39 (J)  H = -3090.92 (J)  S = 0.56 (J/K)  V = 0.08 (cc)  Cp = 0.29 (J/K)

Total solids  mass = 72.22 (gm)  density = 3.27 (gm/cc)
G = -1087450.52 (J)  H = -893426.16 (J)  S = 156.07 (J/K)  V = 22.06 (cc)  Cp = 82.89 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.93 (gm)  density = 3.00 (gm/cc)
G = -1538074.03 (J)  H = -1251062.16 (J)  S = 230.87 (J/K)  V = 33.36 (cc)  Cp = 121.14 (J/K)

Oxygen  delta moles = -0.00203667  delta grams = -0.0651711
G = 572.40 (J)  H = -63.73 (J)  S = -0.51 (J/K)  V = -210.51 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: mafic

T = 960.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.86  delta HM = -5.00  NNO = 0.00  QFM = -0.04  COH = 1.47
IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid  mass = 26.69 (gm)  density = 2.45 (gm/cc)  viscosity = 4.52 (log 10 poise)  (analysis in wt %)
G = -434198.50 (J)  H = -345436.00 (J)  S = 71.98 (J/K)  V = 10.91 (cc)  Cp = 36.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.41 | 0.87 | 15.99 | 0.51 | 0.00 | 2.14 | 0.64 | 0.49 | 0.00 | 0.00 | 3.02 | 4.73 | 2.96 | 0.48 | 3.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 21.13 (gm)  density = 3.86 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.50Mg0.34)3Al2Si3O12
G = -299110.00 (J)  H = -244982.82 (J)  S = 43.89 (J/K)  V = 5.47 (cc)  Cp = 23.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 49.68 | 16.73 | 33.59 |

orthopyroxene  mass = 0.68 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.01Ca0.05Fe"0.76Mg1.10Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -9458.21 (J)  H = -7657.54 (J)  S = 1.46 (J/K)  V = 0.20 (cc)  Cp = 0.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.45 | 94.45 | 76.24 | 6.12 | -5.53 | 7.65 | 0.52 |

clinopyroxene  mass = 32.80 (gm)  density = 3.38 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.78Fe"0.31Mg0.60Fe'"0.06Ti0.06Al0.32Si1.78O6
G = -488220.70 (J)  H = -402291.83 (J)  S = 69.68 (J/K)  V = 9.72 (cc)  Cp = 37.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 25.10 | 14.46 | 31.34 | 15.14 | -2.48 | 8.96 | 7.49 |

clinopyroxene  mass = 0.27 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
cpx Na0.06Ca0.89Fe"0.24Mg0.39Fe'"0.07Ti0.35Al0.69Si1.30O6
G = -4049.28 (J)  H = -3353.13 (J)  S = 0.56 (J/K)  V = 0.08 (cc)  Cp = 0.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.22 | 4.42 | 23.84 | 62.83 | 6.91 | 0.00 | 6.22 |

feldspar  mass = 17.74 (gm)  density = 2.63 (gm/cc)  (analysis in mole %)

K0.03Na0.63Ca0.34Al1.34Si2.66O8
G = -293017.18 (J) H = -242840.47 (J) S = 40.69 (J/K) V = 6.75 (cc) Cp = 21.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 63.16 | 33.73 | 3.12 |

rhm-oxide mass = 0.35 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.62Mg0.15Fe'"0.17Al0.17Ti0.83O3
G = -3650.97 (J) H = -2794.19 (J) S = 0.69 (J/K) V = 0.08 (cc) Cp = 0.34 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.04 | 8.26 | 62.42 | 5.90 | 8.37 |

apatite mass = 0.27 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3976.65 (J) H = -3251.54 (J) S = 0.59 (J/K) V = 0.09 (cc) Cp = 0.31 (J/K)

Total solids mass = 73.23 (gm) density = 3.27 (gm/cc)
G = -1101482.99 (J) H = -907171.51 (J) S = 157.57 (J/K) V = 22.37 (cc) Cp = 83.98 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.93 (gm) density = 3.00 (gm/cc)
G = -1535681.49 (J) H = -1252607.50 (J) S = 229.55 (J/K) V = 33.29 (cc) Cp = 120.78 (J/K)

Oxygen delta moles = -0.00220551 delta grams = -0.0705738
G = 614.32 (J) H = -68.22 (J) S = -0.55 (J/K) V = -226.13 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: mafic

T = 950.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = -0.05 COH = 1.45 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 25.76 (gm) density = 2.44 (gm/cc) viscosity = 4.56 (log 10 poise) (analysis in wt %)
G = -419092.68 (J) H = -334216.84 (J) S = 69.39 (J/K) V = 10.56 (cc) Cp = 35.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.86 | 0.82 | 15.74 | 0.47 | 0.00 | 1.95 | 0.67 | 0.46 | 0.00 | 0.00 | 2.92 | 4.69 | 3.04 | 0.48 | 3.90 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 21.82 (gm) density = 3.86 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.50Mg0.33)3Al2Si3O12
G = -308214.00 (J) H = -253012.36 (J) S = 45.13 (J/K) V = 5.65 (cc) Cp = 24.24 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.00 | 16.74 | 33.26 |

orthopyroxene mass = 0.65 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.77Mg1.10Fe'"0.02Ti0.00Al0.14Si1.92O6
G = -9060.74 (J) H = -7354.26 (J) S = 1.40 (J/K) V = 0.19 (cc) Cp = 0.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.53 | 94.54 | 76.55 | 5.93 | -5.38 | 7.37 | 0.52 |

clinopyroxene mass = 32.09 (gm) density = 3.37 (gm/cc) (analysis in mole %)

cpx Na0.08Ca0.78Fe"0.31Mg0.61Fe'"0.06Ti0.06Al0.31Si1.79O6
G = -477476.77 (J) H = -394468.96 (J) S = 67.86 (J/K) V = 9.51 (cc) Cp = 36.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 26.34 | 14.01 | 31.06 | 14.78 | -2.32 | 8.53 | 7.60 |

clinopyroxene mass = 0.83 (gm) density = 3.52 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.89Fe"0.24Mg0.39Fe'"0.07Ti0.35Al0.69Si1.30O6
G = -12263.77 (J) H = -10180.73 (J) S = 1.70 (J/K) V = 0.23 (cc) Cp = 0.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.29 | 4.21 | 23.75 | 63.36 | 7.04 | -0.41 | 6.34 |

feldspar mass = 18.18 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.64Ca0.33Al1.33Si2.67O8
G = -299895.02 (J) H = -249069.54 (J) S = 41.55 (J/K) V = 6.92 (cc) Cp = 22.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.06 | 32.66 | 3.28 |

rhm-oxide mass = 0.30 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.63Mg0.15Fe'"0.16Al0.16Ti0.84O3
G = -3164.48 (J) H = -2429.37 (J) S = 0.60 (J/K) V = 0.07 (cc) Cp = 0.29 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.01 | 8.02 | 62.68 | 6.19 | 8.09 |

apatite mass = 0.28 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4134.98 (J) H = -3389.19 (J) S = 0.61 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 74.16 (gm) density = 3.27 (gm/cc)
G = -1114209.77 (J) H = -919904.41 (J) S = 158.86 (J/K) V = 22.66 (cc) Cp = 84.97 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 3.01 (gm/cc)
G = -1533302.44 (J) H = -1254121.24 (J) S = 228.25 (J/K) V = 33.22 (cc) Cp = 120.45 (J/K)

Oxygen delta moles = -0.00237393 delta grams = -0.0759628
G = 655.27 (J) H = -72.58 (J) S = -0.60 (J/K) V = -241.42 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: mafic

T = 940.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = -0.06 COH = 1.42 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 24.90 (gm) density = 2.43 (gm/cc) viscosity = 4.60 (log 10 poise) (analysis in wt %)
G = -404998.89 (J) H = -323745.34 (J) S = 66.98 (J/K) V = 10.23 (cc) Cp = 34.25 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.28 | 0.78 | 15.50 | 0.43 | 0.00 | 1.78 | 0.70 | 0.43 | 0.00 | 0.00 | 2.82 | 4.64 | 3.11 | 0.48 | 4.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.48 (gm) density = 3.87 (gm/cc) (analysis in mole %)

(Ca0.17Fe"0.50Mg0.33)3Al2Si3O12
G = -316618.18 (J) H = -260501.76 (J) S = 46.26 (J/K) V = 5.81 (cc) Cp = 24.93 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.31 | 16.76 | 32.93 |

orthopyroxene mass = 0.62 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.77Mg1.10Fe'"0.02Ti0.00Al0.13Si1.92O6
G = -8649.28 (J) H = -7038.07 (J) S = 1.33 (J/K) V = 0.18 (cc) Cp = 0.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.59 | 94.63 | 76.83 | 5.75 | -5.23 | 7.10 | 0.52 |

clinopyroxene mass = 31.41 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.31Mg0.61Fe'"0.06Ti0.06Al0.30Si1.80O6
G = -467286.96 (J) H = -387058.70 (J) S = 66.13 (J/K) V = 9.31 (cc) Cp = 35.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 27.58 | 13.59 | 30.76 | 14.42 | -2.17 | 8.12 | 7.70 |

clinopyroxene mass = 1.36 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.06Ca0.90Fe"0.24Mg0.39Fe'"0.06Ti0.36Al0.70Si1.30O6
G = -20240.59 (J) H = -16844.48 (J) S = 2.80 (J/K) V = 0.39 (cc) Cp = 1.51 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.37 | 4.01 | 23.64 | 63.89 | 7.17 | -0.82 | 6.46 |

feldspar mass = 18.60 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.03Na0.65Ca0.32Al1.32Si2.68O8
G = -306243.77 (J) H = -254884.20 (J) S = 42.34 (J/K) V = 7.08 (cc) Cp = 22.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 64.92 | 31.63 | 3.45 |

rhm-oxide mass = 0.25 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.06Fe"0.63Mg0.15Fe'"0.16Al0.16Ti0.84O3
G = -2632.91 (J) H = -2027.53 (J) S = 0.50 (J/K) V = 0.06 (cc) Cp = 0.24 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.99 | 7.79 | 62.92 | 6.48 | 7.83 |

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4270.01 (J) H = -3508.32 (J) S = 0.63 (J/K) V = 0.09 (cc) Cp = 0.33 (J/K)

Total solids mass = 75.02 (gm) density = 3.27 (gm/cc)
G = -1125941.70 (J) H = -931863.07 (J) S = 159.98 (J/K) V = 22.92 (cc) Cp = 85.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 3.01 (gm/cc)
G = -1530940.59 (J) H = -1255608.41 (J) S = 226.96 (J/K) V = 33.16 (cc) Cp = 120.13 (J/K)

Oxygen delta moles = -0.00253469 delta grams = -0.0811069
G = 693.30 (J) H = -76.59 (J) S = -0.63 (J/K) V = -255.66 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: mafic

T = 930.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = -0.07 COH = 1.39

IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 24.09 (gm) density = 2.43 (gm/cc) viscosity = 4.64 (log 10 poise) (analysis in wt %)
G = -391814.12 (J) H = -313945.58 (J) S = 64.72 (J/K) V = 9.93 (cc) Cp = 33.10 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.69 | 0.74 | 15.26 | 0.40 | 0.00 | 1.62 | 0.73 | 0.41 | 0.00 | 0.00 | 2.74 | 4.59 | 3.18 | 0.48 | 4.17 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.09 (gm) density = 3.87 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.33)3Al2Si3O12
G = -324391.46 (J) H = -267503.88 (J) S = 47.28 (J/K) V = 5.96 (cc) Cp = 25.56 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.61 | 16.77 | 32.62 |

orthopyroxene mass = 0.59 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.77Mg1.10Fe'''0.02Ti0.00Al0.13Si1.93O6
G = -8217.41 (J) H = -6703.63 (J) S = 1.26 (J/K) V = 0.17 (cc) Cp = 0.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.63 | 94.72 | 77.07 | 5.57 | -5.09 | 6.84 | 0.52 |

clinopyroxene mass = 30.78 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.30Mg0.61Fe'''0.06Ti0.06Al0.30Si1.80O6
G = -457660.56 (J) H = -380072.08 (J) S = 64.49 (J/K) V = 9.13 (cc) Cp = 34.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 28.82 | 13.18 | 30.45 | 14.06 | -2.02 | 7.71 | 7.80 |

clinopyroxene mass = 1.89 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.24Mg0.39Fe'''0.06Ti0.36Al0.70Si1.29O6
G = -27943.32 (J) H = -23312.49 (J) S = 3.85 (J/K) V = 0.53 (cc) Cp = 2.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.45 | 3.82 | 23.53 | 64.43 | 7.30 | -1.22 | 6.59 |

feldspar mass = 18.98 (gm) density = 2.63 (gm/cc) (analysis in mole %)
K0.04Na0.66Ca0.31Al1.31Si2.69O8
G = -312115.79 (J) H = -260325.29 (J) S = 43.05 (J/K) V = 7.23 (cc) Cp = 23.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.75 | 30.62 | 3.63 |

rhm-oxide mass = 0.20 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.63Mg0.15Fe'''0.15Al0.15Ti0.85O3
G = -2068.94 (J) H = -1598.17 (J) S = 0.39 (J/K) V = 0.04 (cc) Cp = 0.19 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.96 | 7.55 | 63.15 | 6.77 | 7.57 |

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4384.09 (J) H = -3610.74 (J) S = 0.64 (J/K) V = 0.10 (cc) Cp = 0.34 (J/K)

Total solids mass = 75.82 (gm) density = 3.27 (gm/cc)
G = -1136781.57 (J) H = -943126.27 (J) S = 160.96 (J/K) V = 23.17 (cc) Cp = 86.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 3.02 (gm/cc)
G = -1528595.70 (J) H = -1257071.85 (J) S = 225.68 (J/K) V = 33.10 (cc) Cp = 119.83 (J/K)

Oxygen delta moles = -0.00268794 delta grams = -0.0860109
G = 728.49 (J) H = -80.27 (J) S = -0.67 (J/K) V = -268.88 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: mafic

T = 920.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = -0.08 COH = 1.36 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 23.34 (gm) density = 2.42 (gm/cc) viscosity = 4.68 (log 10 poise) (analysis in wt %)
G = -379449.33 (J) H = -304751.92 (J) S = 62.61 (J/K) V = 9.64 (cc) Cp = 32.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.07 | 0.70 | 15.02 | 0.37 | 0.00 | 1.48 | 0.76 | 0.38 | 0.00 | 0.00 | 2.65 | 4.53 | 3.25 | 0.49 | 4.30 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.66 (gm) density = 3.87 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.32)3Al2Si3O12
G = -331592.80 (J) H = -274063.82 (J) S = 48.22 (J/K) V = 6.11 (cc) Cp = 26.16 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.91 | 16.77 | 32.32 |

orthopyroxene mass = 0.56 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.77Mg1.10Fe'"0.02Ti0.00Al0.13Si1.93O6
G = -7763.66 (J) H = -6349.57 (J) S = 1.19 (J/K) V = 0.16 (cc) Cp = 0.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.65 | 94.81 | 77.28 | 5.40 | -4.95 | 6.59 | 0.51 |

clinopyroxene mass = 30.17 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.79Fe"0.30Mg0.62Fe'"0.05Ti0.06Al0.29Si1.81O6
G = -448589.13 (J) H = -373505.48 (J) S = 62.93 (J/K) V = 8.95 (cc) Cp = 34.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 30.06 | 12.78 | 30.12 | 13.71 | -1.89 | 7.32 | 7.90 |

clinopyroxene mass = 2.39 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.23Mg0.39Fe'"0.06Ti0.36Al0.70Si1.29O6
G = -35355.48 (J) H = -29569.21 (J) S = 4.85 (J/K) V = 0.68 (cc) Cp = 2.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.53 | 3.64 | 23.41 | 64.96 | 7.41 | -1.60 | 6.71 |

feldspar mass = 19.34 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.67Ca0.30Al1.30Si2.70O8
G = -317556.30 (J) H = -265428.05 (J) S = 43.69 (J/K) V = 7.37 (cc) Cp = 23.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.55 | 29.65 | 3.80 |

rhm-oxide mass = 0.14 (gm) density = 4.58 (gm/cc) (analysis in mole %)

Mn0.07Fe"0.63Mg0.15Fe'"0.15Al0.15Ti0.85O3
G = -1481.71 (J) H = -1148.09 (J) S = 0.28 (J/K) V = 0.03 (cc) Cp = 0.14 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.93 | 7.32 | 63.35 | 7.06 | 7.33 |

apatite mass = 0.30 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4479.13 (J) H = -3697.88 (J) S = 0.65 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 76.57 (gm) density = 3.27 (gm/cc)
G = -1146818.21 (J) H = -953762.11 (J) S = 161.80 (J/K) V = 23.40 (cc) Cp = 87.52 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 3.02 (gm/cc)
G = -1526267.54 (J) H = -1258514.02 (J) S = 224.41 (J/K) V = 33.04 (cc) Cp = 119.54 (J/K)

Oxygen delta moles = -0.00283389 delta grams = -0.0906812
G = 760.97 (J) H = -83.61 (J) S = -0.71 (J/K) V = -281.13 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: mafic

T = 910.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = -0.09 COH = 1.34 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 22.63 (gm) density = 2.42 (gm/cc) viscosity = 4.71 (log 10 poise) (analysis in wt %)
G = -367827.10 (J) H = -296107.29 (J) S = 60.62 (J/K) V = 9.37 (cc) Cp = 31.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.44 | 0.66 | 14.79 | 0.34 | 0.00 | 1.34 | 0.79 | 0.36 | 0.00 | 0.00 | 2.58 | 4.46 | 3.31 | 0.49 | 4.44 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.19 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.32)3Al2Si3O12
G = -338272.62 (J) H = -280220.04 (J) S = 49.07 (J/K) V = 6.24 (cc) Cp = 26.71 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.20 | 16.78 | 32.03 |

orthopyroxene mass = 0.53 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.01Ca0.05Fe"0.77Mg1.10Fe'"0.02Ti0.00Al0.12Si1.93O6
G = -7290.05 (J) H = -5977.40 (J) S = 1.11 (J/K) V = 0.15 (cc) Cp = 0.62 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.66 | 94.91 | 77.47 | 5.23 | -4.81 | 6.35 | 0.51 |

clinopyroxene mass = 29.60 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.30Mg0.62Fe'"0.05Ti0.06Al0.28Si1.81O6
G = -440052.41 (J) H = -367345.36 (J) S = 61.45 (J/K) V = 8.79 (cc) Cp = 33.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 31.29 | 12.39 | 29.78 | 13.36 | -1.76 | 6.94 | 7.99 |

clinopyroxene mass = 2.87 (gm) density = 3.53 (gm/cc) (analysis in mole %)

cpx Na0.07Ca0.90Fe"0.23Mg0.39Fe'"0.06Ti0.37Al0.70Si1.29O6
G = -42474.75 (J) H = -35610.81 (J) S = 5.80 (J/K) V = 0.81 (cc) Cp = 3.16 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.62 | 3.46 | 23.28 | 65.49 | 7.53 | -1.98 | 6.83 |

feldspar mass = 19.68 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.67Ca0.29Al1.29Si2.71O8
G = -322604.66 (J) H = -270223.11 (J) S = 44.27 (J/K) V = 7.50 (cc) Cp = 23.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.32 | 28.70 | 3.98 |

rhm-oxide mass = 0.09 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.07Fe"0.64Mg0.15Fe'"0.14Al0.14Ti0.86O3
G = -877.66 (J) H = -682.15 (J) S = 0.17 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.90 | 7.10 | 63.54 | 7.36 | 7.10 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4556.64 (J) H = -3770.89 (J) S = 0.66 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 77.27 (gm) density = 3.27 (gm/cc)
G = -1156128.79 (J) H = -963829.76 (J) S = 162.53 (J/K) V = 23.62 (cc) Cp = 88.25 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 3.03 (gm/cc)
G = -1523955.89 (J) H = -1259937.05 (J) S = 223.15 (J/K) V = 32.98 (cc) Cp = 119.27 (J/K)

Oxygen delta moles = -0.00297278 delta grams = -0.0951254
G = 790.84 (J) H = -86.65 (J) S = -0.74 (J/K) V = -292.43 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 900.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.10 COH = 1.31 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 21.97 (gm) density = 2.41 (gm/cc) viscosity = 4.74 (log 10 poise) (analysis in wt %)
G = -356879.88 (J) H = -287961.92 (J) S = 58.75 (J/K) V = 9.11 (cc) Cp = 30.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.79 | 0.63 | 14.55 | 0.31 | 0.00 | 1.22 | 0.82 | 0.34 | 0.00 | 0.00 | 2.50 | 4.39 | 3.37 | 0.50 | 4.57 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.70 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.51Mg0.32)3Al2Si3O12
G = -344474.22 (J) H = -286005.44 (J) S = 49.84 (J/K) V = 6.36 (cc) Cp = 27.22 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.48 | 16.78 | 31.74 |

orthopyroxene mass = 0.49 (gm) density = 3.47 (gm/cc) (analysis in mole %)

opx Na0.01Ca0.04Fe"0.78Mg1.11Fe'"0.01Ti0.00Al0.12Si1.93O6
G = -6800.90 (J) H = -5590.54 (J) S = 1.03 (J/K) V = 0.14 (cc) Cp = 0.57 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.65 | 95.01 | 77.63 | 5.07 | -4.67 | 6.11 | 0.50 |

clinopyroxene mass = 29.07 (gm) density = 3.37 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.29Mg0.62Fe'"0.05Ti0.06Al0.28Si1.82O6
G = -432022.67 (J) H = -361571.77 (J) S = 60.05 (J/K) V = 8.64 (cc) Cp = 32.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 32.51 | 12.02 | 29.43 | 13.02 | -1.63 | 6.57 | 8.08 |

clinopyroxene mass = 3.33 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.23Mg0.39Fe'"0.05Ti0.37Al0.71Si1.29O6
G = -49308.51 (J) H = -41441.58 (J) S = 6.71 (J/K) V = 0.94 (cc) Cp = 3.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.70 | 3.29 | 23.15 | 66.02 | 7.64 | -2.35 | 6.96 |

feldspar mass = 20.00 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.68Ca0.28Al1.28Si2.72O8
G = -327295.27 (J) H = -274737.23 (J) S = 44.80 (J/K) V = 7.62 (cc) Cp = 24.28 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.05 | 27.78 | 4.17 |

rhm-oxide mass = 0.03 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.08Fe"0.64Mg0.15Fe'"0.14Al0.14Ti0.86O3
G = -261.21 (J) H = -203.65 (J) S = 0.05 (J/K) V = 0.01 (cc) Cp = 0.02 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.87 | 6.88 | 63.72 | 7.65 | 6.88 |

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4617.84 (J) H = -3830.67 (J) S = 0.67 (J/K) V = 0.10 (cc) Cp = 0.36 (J/K)

Total solids mass = 77.93 (gm) density = 3.27 (gm/cc)
G = -1164780.63 (J) H = -973380.87 (J) S = 163.15 (J/K) V = 23.82 (cc) Cp = 88.93 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 3.03 (gm/cc)
G = -1521660.50 (J) H = -1261342.79 (J) S = 221.90 (J/K) V = 32.93 (cc) Cp = 119.00 (J/K)

Oxygen delta moles = -0.00310487 delta grams = -0.0993522
G = 818.24 (J) H = -89.40 (J) S = -0.77 (J/K) V = -302.85 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28
IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 21.34 (gm) density = 2.41 (gm/cc) viscosity = 4.77 (log 10 poise) (analysis in wt %)
G = -346446.12 (J) H = -280190.99 (J) S = 56.96 (J/K) V = 8.86 (cc) Cp = 29.18 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.12 0.60 14.33 0.29 0.00 1.10 0.85 0.32 0.00 0.00 2.44 4.32 3.43 0.50 4.70 0.00 0.00 0.00 0.00

garnet mass = 25.22 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.52Mg0.31)3Al2Si3O12
G = -350977.06 (J) H = -292069.38 (J) S = 50.64 (J/K) V = 6.50 (cc) Cp = 27.76 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.73 | 16.77 | 31.50 |

orthopyroxene mass = 0.38 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.78Mg1.11Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -5165.98 (J) H = -4257.53 (J) S = 0.78 (J/K) V = 0.11 (cc) Cp = 0.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.55 | 95.11 | 77.69 | 4.92 | -4.54 | 5.88 | 0.50 |

clinopyroxene mass = 28.71 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.29Mg0.63Fe'"0.05Ti0.06Al0.27Si1.83O6
G = -426691.45 (J) H = -358032.84 (J) S = 59.03 (J/K) V = 8.53 (cc) Cp = 32.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 33.77 | 11.66 | 29.03 | 12.68 | -1.51 | 6.21 | 8.16 |

clinopyroxene mass = 3.63 (gm) density = 3.53 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.23Mg0.39Fe'"0.05Ti0.37Al0.71Si1.28O6
G = -53602.89 (J) H = -45161.36 (J) S = 7.26 (J/K) V = 1.03 (cc) Cp = 3.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.77 | 3.13 | 22.98 | 66.56 | 7.74 | -2.72 | 7.08 |

feldspar mass = 20.30 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.04Na0.69Ca0.27Al1.27Si2.73O8
G = -331833.36 (J) H = -279141.68 (J) S = 45.30 (J/K) V = 7.74 (cc) Cp = 24.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.74 | 26.90 | 4.35 |

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4666.11 (J) H = -3879.94 (J) S = 0.68 (J/K) V = 0.10 (cc) Cp = 0.36 (J/K)

Total solids mass = 78.56 (gm) density = 3.27 (gm/cc)
G = -1172936.85 (J) H = -982542.73 (J) S = 163.69 (J/K) V = 24.01 (cc) Cp = 89.57 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 3.04 (gm/cc)
G = -1519382.97 (J) H = -1262733.72 (J) S = 220.65 (J/K) V = 32.87 (cc) Cp = 118.75 (J/K)

Oxygen delta moles = -0.00322704 delta grams = -0.103261
G = 842.39 (J) H = -91.77 (J) S = -0.80 (J/K) V = -312.08 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: mafic

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25

IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 20.74 (gm) density = 2.40 (gm/cc) viscosity = 4.80 (log 10 poise) (analysis in wt %)
G = -336509.55 (J) H = -272784.05 (J) S = 55.26 (J/K) V = 8.63 (cc) Cp = 28.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.43 | 0.57 | 14.12 | 0.26 | 0.00 | 1.00 | 0.88 | 0.30 | 0.00 | 0.00 | 2.37 | 4.24 | 3.49 | 0.51 | 4.84 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.76 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.52Mg0.31)3Al2Si3O12
G = -357657.24 (J) H = -298309.43 (J) S = 51.47 (J/K) V = 6.63 (cc) Cp = 28.31 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.96 | 16.76 | 31.28 |

orthopyroxene mass = 0.20 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.04Fe"0.78Mg1.11Fe'''0.01Ti0.00Al0.11Si1.94O6
G = -2682.50 (J) H = -2216.53 (J) S = 0.40 (J/K) V = 0.06 (cc) Cp = 0.23 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.38 | 95.21 | 77.67 | 4.76 | -4.41 | 5.66 | 0.49 |

clinopyroxene mass = 28.48 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.80Fe"0.29Mg0.63Fe'''0.04Ti0.05Al0.26Si1.83O6
G = -423359.58 (J) H = -356155.80 (J) S = 58.28 (J/K) V = 8.47 (cc) Cp = 32.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 35.07 | 11.30 | 28.59 | 12.36 | -1.41 | 5.86 | 8.24 |

clinopyroxene mass = 3.79 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.23Mg0.39Fe'''0.05Ti0.37Al0.71Si1.28O6
G = -56020.88 (J) H = -47314.27 (J) S = 7.55 (J/K) V = 1.07 (cc) Cp = 4.17 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.83 | 2.98 | 22.78 | 67.10 | 7.83 | -3.07 | 7.20 |

feldspar mass = 20.60 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.69Ca0.26Al1.26Si2.74O8
G = -336191.08 (J) H = -283411.98 (J) S = 45.77 (J/K) V = 7.86 (cc) Cp = 24.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.40 | 26.06 | 4.54 |

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4701.69 (J) H = -3918.82 (J) S = 0.68 (J/K) V = 0.10 (cc) Cp = 0.36 (J/K)

Total solids mass = 79.16 (gm) density = 3.27 (gm/cc)
G = -1180612.97 (J) H = -991326.81 (J) S = 164.15 (J/K) V = 24.19 (cc) Cp = 90.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 3.04 (gm/cc)
G = -1517122.52 (J) H = -1264110.86 (J) S = 219.41 (J/K) V = 32.82 (cc) Cp = 118.50 (J/K)

Oxygen delta moles = -0.00334061 delta grams = -0.106895

G = 863.73 (J)  H = -93.82 (J)  S = -0.83 (J/K)  V = -320.29 (cc)  Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 870.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -12.45  delta HM = -5.07  NNO = 0.00  QFM = -0.13  COH = 1.22  IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid  mass = 20.17 (gm)  density = 2.40 (gm/cc)  viscosity = 4.83 (log 10 poise)  (analysis in wt %)
G = -327099.10 (J)  H = -265766.59 (J)  S = 53.65 (J/K)  V = 8.41 (cc)  Cp = 27.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.73 | 0.53 | 13.91 | 0.24 | 0.00 | 0.90 | 0.90 | 0.29 | 0.00 | 0.00 | 2.32 | 4.15 | 3.54 | 0.52 | 4.98 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 26.28 (gm)  density = 3.89 (gm/cc)  (analysis in mole %)
(Ca0.17Fe"0.52Mg0.31)3Al2Si3O12
G = -364016.71 (J)  H = -304307.65 (J)  S = 52.23 (J/K)  V = 6.76 (cc)  Cp = 28.84 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.18 | 16.75 | 31.07 |

orthopyroxene  mass = 0.01 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.04Fe"0.78Mg1.12Fe'"0.01Ti0.00Al0.11Si1.94O6
G = -173.66 (J)  H = -143.87 (J)  S = 0.03 (J/K)  V = 0.00 (cc)  Cp = 0.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.19 | 95.31 | 77.63 | 4.61 | -4.28 | 5.44 | 0.49 |

clinopyroxene  mass = 28.28 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.81Fe"0.28Mg0.64Fe'"0.04Ti0.05Al0.26Si1.84O6
G = -420375.33 (J)  H = -354555.83 (J)  S = 57.58 (J/K)  V = 8.42 (cc)  Cp = 31.88 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 36.35 | 10.95 | 28.13 | 12.04 | -1.31 | 5.52 | 8.32 |

clinopyroxene  mass = 3.94 (gm)  density = 3.54 (gm/cc)  (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.23Mg0.39Fe'"0.05Ti0.38Al0.72Si1.28O6
G = -58224.39 (J)  H = -49295.26 (J)  S = 7.81 (J/K)  V = 1.11 (cc)  Cp = 4.33 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.89 | 2.84 | 22.58 | 67.64 | 7.93 | -3.41 | 7.32 |

feldspar  mass = 20.88 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.70Ca0.25Al1.25Si2.75O8
G = -340265.06 (J)  H = -287459.38 (J)  S = 46.19 (J/K)  V = 7.97 (cc)  Cp = 25.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.03 | 25.24 | 4.73 |

apatite  mass = 0.32 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4723.36 (J)  H = -3946.21 (J)  S = 0.68 (J/K)  V = 0.11 (cc)  Cp = 0.37 (J/K)

Total solids  mass = 79.72 (gm)  density = 3.27 (gm/cc)
G = -1187778.52 (J)  H = -999708.20 (J)  S = 164.52 (J/K)  V = 24.37 (cc)  Cp = 90.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 3.05 (gm/cc)
G = -1514877.62 (J) H = -1265474.79 (J) S = 218.17 (J/K) V = 32.77 (cc) Cp = 118.26 (J/K)

Oxygen delta moles = -0.00344833 delta grams = -0.110343
G = 883.02 (J) H = -95.62 (J) S = -0.86 (J/K) V = -327.75 (cc) Cp = -0.12 (J/K)

**********----------**********
Title: mafic

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 19.60 (gm) density = 2.40 (gm/cc) viscosity = 4.85 (log 10 poise) (analysis in wt %)
G = -317666.87 (J) H = -258687.03 (J) S = 52.05 (J/K) V = 8.18 (cc) Cp = 26.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.98 | 0.50 | 13.73 | 0.22 | 0.00 | 0.81 | 0.93 | 0.27 | 0.00 | 0.00 | 2.27 | 4.05 | 3.59 | 0.53 | 5.12 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 26.64 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.52Mg0.31)3Al2Si3O12
G = -368187.88 (J) H = -308498.75 (J) S = 52.68 (J/K) V = 6.84 (cc) Cp = 29.19 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.41 | 16.81 | 30.78 |

clinopyroxene mass = 27.99 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.81Fe"0.28Mg0.64Fe'"0.04Ti0.05Al0.25Si1.84O6
G = -416127.44 (J) H = -351875.16 (J) S = 56.70 (J/K) V = 8.33 (cc) Cp = 31.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 37.67 | 10.54 | 27.66 | 11.76 | -1.25 | 5.24 | 8.39 |

clinopyroxene mass = 4.10 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.22Mg0.38Fe'"0.04Ti0.38Al0.72Si1.28O6
G = -60500.99 (J) H = -51346.85 (J) S = 8.08 (J/K) V = 1.16 (cc) Cp = 4.50 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -4.97 | 2.68 | 22.40 | 68.21 | 7.98 | -3.71 | 7.41 |

feldspar mass = 21.23 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.25Al1.25Si2.75O8
G = -345428.16 (J) H = -292448.69 (J) S = 46.75 (J/K) V = 8.11 (cc) Cp = 25.73 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.52 | 24.57 | 4.91 |

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4737.33 (J) H = -3967.24 (J) S = 0.68 (J/K) V = 0.11 (cc) Cp = 0.37 (J/K)

Total solids mass = 80.29 (gm) density = 3.27 (gm/cc)
G = -1194981.81 (J) H = -1008136.70 (J) S = 164.89 (J/K) V = 24.55 (cc) Cp = 91.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.89 (gm) density = 3.05 (gm/cc)
G = -1512648.68 (J) H = -1266823.73 (J) S = 216.94 (J/K) V = 32.73 (cc) Cp = 118.03 (J/K)

Oxygen delta moles = -0.00354938 delta grams = -0.113576
G = 900.09 (J) H = -97.17 (J) S = -0.88 (J/K) V = -334.40 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 19.06 (gm) density = 2.39 (gm/cc) viscosity = 4.87 (log 10 poise) (analysis in wt %)
G = -308664.49 (J) H = -251922.16 (J) S = 50.52 (J/K) V = 7.97 (cc) Cp = 25.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.21 | 0.47 | 13.55 | 0.20 | 0.00 | 0.73 | 0.95 | 0.26 | 0.00 | 0.00 | 2.22 | 3.95 | 3.64 | 0.55 | 5.27 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 26.97 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -371945.61 (J) H = -312359.70 (J) S = 53.05 (J/K) V = 6.92 (cc) Cp = 29.51 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.62 | 16.88 | 30.49 |

clinopyroxene mass = 27.71 (gm) density = 3.36 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.81Fe"0.27Mg0.64Fe'"0.04Ti0.05Al0.25Si1.85O6
G = -412016.42 (J) H = -349289.98 (J) S = 55.85 (J/K) V = 8.26 (cc) Cp = 31.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 38.99 | 10.13 | 27.17 | 11.48 | -1.19 | 4.97 | 8.45 |

clinopyroxene mass = 4.25 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.07Ca0.90Fe"0.22Mg0.38Fe'"0.04Ti0.38Al0.72Si1.27O6
G = -62634.32 (J) H = -53285.54 (J) S = 8.32 (J/K) V = 1.20 (cc) Cp = 4.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.06 | 2.53 | 22.22 | 68.77 | 8.03 | -3.99 | 7.49 |

feldspar mass = 21.57 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.24Al1.24Si2.76O8
G = -350435.84 (J) H = -297326.23 (J) S = 47.29 (J/K) V = 8.24 (cc) Cp = 26.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.99 | 23.92 | 5.09 |

apatite mass = 0.33 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4738.06 (J) H = -3977.20 (J) S = 0.68 (J/K) V = 0.11 (cc) Cp = 0.37 (J/K)

Total solids mass = 80.83 (gm) density = 3.27 (gm/cc)
G = -1201770.25 (J) H = -1016238.65 (J) S = 165.19 (J/K) V = 24.72 (cc) Cp = 91.87 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.06 (gm/cc)
G = -1510434.73 (J) H = -1268160.81 (J) S = 215.71 (J/K) V = 32.69 (cc) Cp = 117.82 (J/K)

Oxygen delta moles = -0.00364547 delta grams = -0.116651
G = 915.42 (J) H = -98.51 (J) S = -0.90 (J/K) V = -340.42 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 18.54 (gm) density = 2.39 (gm/cc) viscosity = 4.89 (log 10 poise) (analysis in wt %)
G = -300098.44 (J) H = -245480.61 (J) S = 49.07 (J/K) V = 7.76 (cc) Cp = 25.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.42 | 0.44 | 13.37 | 0.18 | 0.00 | 0.66 | 0.98 | 0.24 | 0.00 | 0.00 | 2.19 | 3.85 | 3.69 | 0.56 | 5.41 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 27.29 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -375455.98 (J) H = -316027.71 (J) S = 53.39 (J/K) V = 7.00 (cc) Cp = 29.80 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.84 | 16.96 | 30.21 |

clinopyroxene mass = 27.45 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.82Fe"0.27Mg0.65Fe'"0.04Ti0.05Al0.24Si1.85O6
G = -408136.91 (J) H = -346881.36 (J) S = 55.03 (J/K) V = 8.18 (cc) Cp = 30.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 40.29 | 9.73 | 26.68 | 11.22 | -1.14 | 4.71 | 8.51 |

clinopyroxene mass = 4.38 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.22Mg0.38Fe'"0.04Ti0.39Al0.73Si1.27O6
G = -64618.91 (J) H = -55105.73 (J) S = 8.55 (J/K) V = 1.24 (cc) Cp = 4.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.15 | 2.39 | 22.04 | 69.33 | 8.07 | -4.26 | 7.58 |

feldspar mass = 21.90 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.71Ca0.23Al1.23Si2.77O8
G = -355200.33 (J) H = -302016.18 (J) S = 47.78 (J/K) V = 8.36 (cc) Cp = 26.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.42 | 23.30 | 5.28 |

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4725.04 (J) H = -3975.59 (J) S = 0.67 (J/K) V = 0.11 (cc) Cp = 0.37 (J/K)

Total solids mass = 81.34 (gm) density = 3.27 (gm/cc)
G = -1208137.16 (J) H = -1024006.57 (J) S = 165.41 (J/K) V = 24.89 (cc) Cp = 92.39 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.06 (gm/cc)
G = -1508235.60 (J) H = -1269487.18 (J) S = 214.48 (J/K) V = 32.65 (cc) Cp = 117.61 (J/K)

Oxygen delta moles = -0.00373691 delta grams = -0.119577
G = 929.14 (J) H = -99.66 (J) S = -0.92 (J/K) V = -345.85 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 830.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.17 COH = 1.09 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 17.77 (gm) density = 2.39 (gm/cc) viscosity = 4.84 (log 10 poise) (analysis in wt %)
G = -287344.62 (J) H = -235438.79 (J) S = 47.05 (J/K) V = 7.45 (cc) Cp = 24.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.32 | 0.41 | 13.30 | 0.16 | 0.00 | 0.59 | 1.02 | 0.23 | 0.00 | 0.00 | 2.15 | 3.82 | 3.77 | 0.59 | 5.65 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 27.68 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -380087.27 (J) H = -320668.45 (J) S = 53.86 (J/K) V = 7.10 (cc) Cp = 30.18 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.96 | 17.10 | 29.94 |

clinopyroxene mass = 27.14 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.82Fe"0.26Mg0.65Fe'"0.03Ti0.05Al0.24Si1.86O6
G = -403665.01 (J) H = -343959.53 (J) S = 54.12 (J/K) V = 8.09 (cc) Cp = 30.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 41.67 | 9.27 | 26.05 | 10.98 | -1.13 | 4.53 | 8.62 |

clinopyroxene mass = 4.54 (gm) density = 3.54 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.22Mg0.38Fe'"0.04Ti0.39Al0.73Si1.26O6
G = -66929.23 (J) H = -57212.76 (J) S = 8.81 (J/K) V = 1.28 (cc) Cp = 4.97 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.20 | 2.25 | 21.79 | 69.90 | 8.10 | -4.49 | 7.66 |

feldspar mass = 22.17 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.72Ca0.23Al1.23Si2.77O8
G = -359123.53 (J) H = -306003.21 (J) S = 48.15 (J/K) V = 8.47 (cc) Cp = 26.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.78 | 22.65 | 5.58 |

quartz mass = 0.26 (gm) density = 2.56 (gm/cc)
SiO2
G = -4176.66 (J) H = -3595.70 (J) S = 0.53 (J/K) V = 0.10 (cc) Cp = 0.30 (J/K)

apatite mass = 0.33 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4729.48 (J) H = -3988.65 (J) S = 0.67 (J/K) V = 0.11 (cc) Cp = 0.37 (J/K)

Total solids mass = 82.11 (gm) density = 3.26 (gm/cc)
G = -1218711.19 (J) H = -1035428.30 (J) S = 166.15 (J/K) V = 25.15 (cc) Cp = 93.21 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.06 (gm/cc)
G = -1506055.81 (J) H = -1270867.09 (J) S = 213.20 (J/K) V = 32.60 (cc) Cp = 117.39 (J/K)

Oxygen delta moles = -0.0038154 delta grams = -0.122088
G = 939.22 (J) H = -100.41 (J) S = -0.94 (J/K) V = -349.95 (cc) Cp = -0.13 (J/K)

**********----------**********
Title: mafic

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 16.86 (gm) density = 2.38 (gm/cc) viscosity = 4.75 (log 10 poise) (analysis in wt %)
G = -272428.52 (J) H = -223499.49 (J) S = 44.76 (J/K) V = 7.08 (cc) Cp = 22.98 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.98 | 0.37 | 13.27 | 0.15 | 0.00 | 0.54 | 1.08 | 0.21 | 0.00 | 0.00 | 2.13 | 3.83 | 3.87 | 0.62 | 5.95 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 28.10 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.30)3Al2Si3O12
G = -385230.07 (J) H = -325767.97 (J) S = 54.40 (J/K) V = 7.20 (cc) Cp = 30.60 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.04 | 17.29 | 29.67 |

clinopyroxene mass = 26.81 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.82Fe"0.25Mg0.65Fe'"0.03Ti0.05Al0.24Si1.86O6
G = -398980.90 (J) H = -340839.02 (J) S = 53.19 (J/K) V = 8.00 (cc) Cp = 30.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 43.07 | 8.79 | 25.36 | 10.76 | -1.15 | 4.41 | 8.76 |

clinopyroxene mass = 4.71 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.22Mg0.38Fe'"0.03Ti0.39Al0.73Si1.26O6
G = -69327.67 (J) H = -59404.72 (J) S = 9.08 (J/K) V = 1.33 (cc) Cp = 5.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.24 | 2.10 | 21.51 | 70.47 | 8.13 | -4.71 | 7.74 |

feldspar mass = 22.42 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.72Ca0.22Al1.22Si2.78O8
G = -362613.15 (J) H = -309631.84 (J) S = 48.47 (J/K) V = 8.57 (cc) Cp = 27.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.06 | 21.97 | 5.97 |

quartz mass = 0.65 (gm) density = 2.56 (gm/cc)
SiO2
G = -10581.28 (J) H = -9128.55 (J) S = 1.33 (J/K) V = 0.25 (cc) Cp = 0.76 (J/K)

apatite mass = 0.33 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4731.79 (J) H = -3999.91 (J) S = 0.67 (J/K) V = 0.11 (cc) Cp = 0.37 (J/K)

Total solids mass = 83.02 (gm) density = 3.26 (gm/cc)
G = -1231464.86 (J) H = -1048772.01 (J) S = 167.13 (J/K) V = 25.46 (cc) Cp = 94.18 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.88 (gm) density = 3.07 (gm/cc)
G = -1503893.38 (J) H = -1272271.50 (J) S = 211.88 (J/K) V = 32.55 (cc) Cp = 117.16 (J/K)

Oxygen delta moles = -0.00388582 delta grams = -0.124342
G = 946.96 (J) H = -100.89 (J) S = -0.96 (J/K) V = -353.17 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 15.97 (gm) density = 2.37 (gm/cc) viscosity = 4.64 (log 10 poise) (analysis in wt %)
G = -257924.31 (J) H = -211848.11 (J) S = 42.54 (J/K) V = 6.73 (cc) Cp = 21.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.60 | 0.33 | 13.25 | 0.14 | 0.00 | 0.49 | 1.14 | 0.20 | 0.00 | 0.00 | 2.11 | 3.84 | 3.95 | 0.65 | 6.28 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 28.51 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.17Fe"0.53Mg0.29)3Al2Si3O12
G = -390137.53 (J) H = -330688.94 (J) S = 54.88 (J/K) V = 7.30 (cc) Cp = 31.00 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.10 | 17.49 | 29.41 |

clinopyroxene mass = 26.49 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.25Mg0.66Fe'"0.03Ti0.05Al0.24Si1.86O6
G = -394530.02 (J) H = -337893.62 (J) S = 52.29 (J/K) V = 7.91 (cc) Cp = 29.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 44.44 | 8.34 | 24.67 | 10.54 | -1.18 | 4.29 | 8.91 |

clinopyroxene mass = 4.86 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.21Mg0.38Fe'"0.03Ti0.40Al0.74Si1.26O6
G = -71553.31 (J) H = -61457.63 (J) S = 9.32 (J/K) V = 1.37 (cc) Cp = 5.31 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.29 | 1.97 | 21.23 | 71.04 | 8.15 | -4.91 | 7.81 |

feldspar mass = 22.67 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.72Ca0.21Al1.21Si2.79O8
G = -366087.97 (J) H = -313260.25 (J) S = 48.77 (J/K) V = 8.67 (cc) Cp = 27.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.29 | 21.30 | 6.41 |

quartz mass = 1.04 (gm) density = 2.56 (gm/cc)
SiO2
G = -16800.63 (J) H = -14524.31 (J) S = 2.10 (J/K) V = 0.40 (cc) Cp = 1.21 (J/K)

apatite mass = 0.33 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4711.80 (J) H = -3992.29 (J) S = 0.66 (J/K) V = 0.11 (cc) Cp = 0.36 (J/K)

Total solids mass = 83.90 (gm) density = 3.26 (gm/cc)
G = -1243821.27 (J) H = -1061817.05 (J) S = 168.03 (J/K) V = 25.77 (cc) Cp = 95.14 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.07 (gm/cc)
G = -1501745.58 (J) H = -1273665.15 (J) S = 210.57 (J/K) V = 32.49 (cc) Cp = 116.95 (J/K)

Oxygen delta moles = -0.00395349 delta grams = -0.126507
G = 953.71 (J) H = -101.25 (J) S = -0.97 (J/K) V = -356.04 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 800.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.20 COH = 0.99 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 15.10 (gm) density = 2.37 (gm/cc) viscosity = 4.52 (log 10 poise) (analysis in wt %)
G = -243694.11 (J) H = -200370.65 (J) S = 40.37 (J/K) V = 6.38 (cc) Cp = 20.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.14 | 0.29 | 13.24 | 0.13 | 0.00 | 0.45 | 1.20 | 0.19 | 0.00 | 0.00 | 2.11 | 3.86 | 4.03 | 0.70 | 6.64 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 28.90 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.53Mg0.29)3Al2Si3O12
G = -394858.43 (J) H = -335471.51 (J) S = 55.34 (J/K) V = 7.40 (cc) Cp = 31.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.16 | 17.69 | 29.15 |

clinopyroxene mass = 26.19 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.24Mg0.66Fe'"0.03Ti0.05Al0.24Si1.87O6
G = -390276.22 (J) H = -335094.19 (J) S = 51.42 (J/K) V = 7.83 (cc) Cp = 29.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 45.78 | 7.90 | 23.99 | 10.32 | -1.22 | 4.18 | 9.05 |

clinopyroxene mass = 5.01 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.21Mg0.38Fe'"0.03Ti0.40Al0.74Si1.25O6
G = -73625.22 (J) H = -63386.83 (J) S = 9.54 (J/K) V = 1.41 (cc) Cp = 5.46 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.34 | 1.84 | 20.95 | 71.61 | 8.17 | -5.11 | 7.88 |

feldspar mass = 22.93 (gm) density = 2.62 (gm/cc) (analysis in mole %)

K0.07Na0.72Ca0.21Al1.21Si2.79O8
G = -369595.47 (J) H = -316928.91 (J) S = 49.08 (J/K) V = 8.77 (cc) Cp = 27.81 (J/K)
albite anorthite sanidine
72.48 20.63 6.89

quartz mass = 1.41 (gm) density = 2.56 (gm/cc)
SiO2
G = -22894.66 (J) H = -19833.86 (J) S = 2.85 (J/K) V = 0.55 (cc) Cp = 1.65 (J/K)

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4668.21 (J) H = -3964.54 (J) S = 0.66 (J/K) V = 0.11 (cc) Cp = 0.36 (J/K)

Total solids mass = 84.77 (gm) density = 3.25 (gm/cc)
G = -1255918.22 (J) H = -1074679.83 (J) S = 168.88 (J/K) V = 26.07 (cc) Cp = 96.09 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.08 (gm/cc)
G = -1499612.33 (J) H = -1275050.47 (J) S = 209.25 (J/K) V = 32.44 (cc) Cp = 116.75 (J/K)

Oxygen delta moles = -0.00401855 delta grams = -0.128589
G = 959.51 (J) H = -101.51 (J) S = -0.99 (J/K) V = -358.56 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 14.24 (gm) density = 2.36 (gm/cc) viscosity = 4.38 (log 10 poise) (analysis in wt %)
G = -229577.55 (J) H = -188932.95 (J) S = 38.23 (J/K) V = 6.03 (cc) Cp = 19.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.61 | 0.26 | 13.22 | 0.12 | 0.00 | 0.41 | 1.28 | 0.18 | 0.00 | 0.00 | 2.12 | 3.89 | 4.10 | 0.75 | 7.05 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 29.29 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.53Mg0.29)3Al2Si3O12
G = -399442.49 (J) H = -340157.06 (J) S = 55.76 (J/K) V = 7.50 (cc) Cp = 31.75 (J/K)
almandine grossular pyrope
53.21 17.90 28.89

clinopyroxene mass = 25.91 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.83Fe"0.23Mg0.66Fe'''0.03Ti0.04Al0.23Si1.87O6
G = -386181.70 (J) H = -332409.83 (J) S = 50.58 (J/K) V = 7.75 (cc) Cp = 29.10 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
47.09 7.49 23.31 10.10 -1.26 4.08 9.19

clinopyroxene mass = 5.14 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.21Mg0.38Fe'''0.03Ti0.40Al0.75Si1.25O6
G = -75561.68 (J) H = -65207.11 (J) S = 9.74 (J/K) V = 1.45 (cc) Cp = 5.60 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-5.39 1.72 20.66 72.18 8.19 -5.30 7.95

feldspar mass = 23.19 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.73Ca0.20Al1.20Si2.80O8
G = -373199.74 (J) H = -320692.81 (J) S = 49.39 (J/K) V = 8.87 (cc) Cp = 28.16 (J/K)
albite anorthite sanidine
72.62 19.95 7.43

quartz mass = 1.79 (gm) density = 2.56 (gm/cc)
SiO2
G = -28931.74 (J) H = -25115.85 (J) S = 3.59 (J/K) V = 0.70 (cc) Cp = 2.08 (J/K)

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4598.70 (J) H = -3914.54 (J) S = 0.64 (J/K) V = 0.10 (cc) Cp = 0.36 (J/K)

Total solids mass = 85.63 (gm) density = 3.25 (gm/cc)
G = -1267916.04 (J) H = -1087497.20 (J) S = 169.70 (J/K) V = 26.37 (cc) Cp = 97.05 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.08 (gm/cc)
G = -1497493.59 (J) H = -1276430.15 (J) S = 207.93 (J/K) V = 32.39 (cc) Cp = 116.57 (J/K)

Oxygen delta moles = -0.00408119 delta grams = -0.130593
G = 964.43 (J) H = -101.66 (J) S = -1.00 (J/K) V = -360.75 (cc) Cp = -0.14 (J/K)

**********----------**********
Title: mafic

T = 780.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.23 COH = 0.92 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 13.12 (gm) density = 2.36 (gm/cc) viscosity = 4.18 (log 10 poise) (analysis in wt %)
G = -211488.74 (J) H = -174114.00 (J) S = 35.49 (J/K) V = 5.57 (cc) Cp = 18.06 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.92 0.22 13.18 0.12 0.00 0.38 1.38 0.17 0.00 0.00 2.18 3.97 4.09 0.83 7.57 0.00 0.00 0.00 0.00

garnet mass = 29.58 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.18Fe"0.53Mg0.28)3Al2Si3O12
G = -402520.55 (J) H = -343564.84 (J) S = 55.98 (J/K) V = 7.57 (cc) Cp = 32.00 (J/K)
almandine grossular pyrope
53.37 18.30 28.33

clinopyroxene mass = 25.46 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.09Ca0.84Fe"0.23Mg0.67Fe'"0.03Ti0.04Al0.23Si1.87O6
G = -379552.24 (J) H = -327497.65 (J) S = 49.43 (J/K) V = 7.62 (cc) Cp = 28.57 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
48.21 7.03 22.80 9.91 -1.35 4.06 9.34

clinopyroxene mass = 5.30 (gm) density = 3.55 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.90Fe"0.21Mg0.38Fe'"0.03Ti0.40Al0.75Si1.25O6
G = -77791.60 (J) H = -67285.07 (J) S = 9.98 (J/K) V = 1.49 (cc) Cp = 5.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -5.60 | 1.58 | 20.54 | 72.76 | 8.17 | -5.43 | 7.98 |

biotite mass = 0.23 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -3731.80 (J) H = -3193.74 (J) S = 0.51 (J/K) V = 0.08 (cc) Cp = 0.30 (J/K)

| annite | phlogopite |
|---|---|
| 1.76 | 98.24 |

feldspar mass = 23.54 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.73Ca0.19Al1.19Si2.81O8
G = -378294.44 (J) H = -325763.73 (J) S = 49.88 (J/K) V = 9.01 (cc) Cp = 28.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.70 | 19.48 | 7.82 |

quartz mass = 2.32 (gm) density = 2.56 (gm/cc)
SiO2
G = -37460.02 (J) H = -32586.58 (J) S = 4.63 (J/K) V = 0.91 (cc) Cp = 2.70 (J/K)

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4552.56 (J) H = -3884.19 (J) S = 0.63 (J/K) V = 0.10 (cc) Cp = 0.35 (J/K)

Total solids mass = 86.74 (gm) density = 3.24 (gm/cc)
G = -1283903.22 (J) H = -1103775.81 (J) S = 171.04 (J/K) V = 26.78 (cc) Cp = 98.33 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.09 (gm/cc)
G = -1495391.96 (J) H = -1277889.81 (J) S = 206.53 (J/K) V = 32.35 (cc) Cp = 116.39 (J/K)

Oxygen delta moles = -0.00413673 delta grams = -0.13237
G = 967.40 (J) H = -101.59 (J) S = -1.02 (J/K) V = -362.22 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 770.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.24 COH = 0.88 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 11.24 (gm) density = 2.34 (gm/cc) viscosity = 3.82 (log 10 poise) (analysis in wt %)
G = -181174.80 (J) H = -148975.68 (J) S = 30.87 (J/K) V = 4.80 (cc) Cp = 15.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.77 | 0.18 | 13.05 | 0.12 | 0.00 | 0.37 | 1.62 | 0.15 | 0.00 | 0.00 | 2.32 | 4.20 | 3.83 | 0.94 | 8.45 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 29.56 (gm) density = 3.91 (gm/cc) (analysis in mole %)

(Ca0.19Fe"0.54Mg0.27)3Al2Si3O12
G = -400898.60 (J) H = -342933.97 (J) S = 55.57 (J/K) V = 7.56 (cc) Cp = 31.88 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.87 | 19.34 | 26.79 |

clinopyroxene mass = 24.48 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.84Fe"0.23Mg0.66Fe'"0.03Ti0.04Al0.24Si1.87O6
G = -364327.39 (J) H = -315054.58 (J) S = 47.23 (J/K) V = 7.32 (cc) Cp = 27.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 48.70 | 6.37 | 22.89 | 9.82 | -1.56 | 4.25 | 9.52 |

clinopyroxene mass = 5.54 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.21Mg0.37Fe'"0.03Ti0.41Al0.76Si1.24O6
G = -81136.10 (J) H = -70324.88 (J) S = 10.36 (J/K) V = 1.56 (cc) Cp = 6.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -6.34 | 1.41 | 21.02 | 73.36 | 8.05 | -5.38 | 7.90 |

biotite mass = 1.24 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -19716.75 (J) H = -16911.53 (J) S = 2.69 (J/K) V = 0.45 (cc) Cp = 1.57 (J/K)

| annite | phlogopite |
|---|---|
| 1.89 | 98.11 |

feldspar mass = 24.14 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.73Ca0.20Al1.20Si2.80O8
G = -387419.69 (J) H = -334371.12 (J) S = 50.85 (J/K) V = 9.23 (cc) Cp = 29.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.78 | 19.75 | 7.47 |

quartz mass = 3.35 (gm) density = 2.56 (gm/cc)
SiO2
G = -54004.43 (J) H = -47075.44 (J) S = 6.64 (J/K) V = 1.31 (cc) Cp = 3.89 (J/K)

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4637.45 (J) H = -3965.71 (J) S = 0.64 (J/K) V = 0.11 (cc) Cp = 0.36 (J/K)

Total solids mass = 88.63 (gm) density = 3.22 (gm/cc)
G = -1312140.41 (J) H = -1130637.24 (J) S = 174.00 (J/K) V = 27.52 (cc) Cp = 100.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.09 (gm/cc)
G = -1493315.21 (J) H = -1279612.93 (J) S = 204.86 (J/K) V = 32.32 (cc) Cp = 116.16 (J/K)

Oxygen delta moles = -0.00417469 delta grams = -0.133585
G = 966.04 (J) H = -101.06 (J) S = -1.02 (J/K) V = -362.07 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 760.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.25 COH = 0.84
IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 9.51 (gm) density = 2.33 (gm/cc) viscosity = 3.37 (log 10 poise) (analysis in wt %)
G = -153368.69 (J) H = -125839.47 (J) S = 26.65 (J/K) V = 4.09 (cc) Cp = 13.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.21 | 0.14 | 12.87 | 0.12 | 0.00 | 0.37 | 1.91 | 0.13 | 0.00 | 0.00 | 2.53 | 4.50 | 3.52 | 1.11 | 9.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 29.59 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.20Fe"0.54Mg0.25)3Al2Si3O12
G = -399920.48 (J) H = -342864.19 (J) S = 55.23 (J/K) V = 7.56 (cc) Cp = 31.81 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.27 | 20.37 | 25.35 |

clinopyroxene mass = 23.58 (gm) density = 3.34 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.84Fe"0.23Mg0.65Fe'"0.03Ti0.04Al0.24Si1.88O6
G = -350412.41 (J) H = -303688.72 (J) S = 45.22 (J/K) V = 7.05 (cc) Cp = 26.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 49.15 | 5.81 | 22.97 | 9.71 | -1.76 | 4.42 | 9.70 |

clinopyroxene mass = 5.74 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.21Mg0.36Fe'"0.03Ti0.41Al0.76Si1.23O6
G = -84000.96 (J) H = -72960.87 (J) S = 10.69 (J/K) V = 1.61 (cc) Cp = 6.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.07 | 1.25 | 21.46 | 73.95 | 7.94 | -5.36 | 7.83 |

biotite mass = 2.14 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -34001.53 (J) H = -29228.81 (J) S = 4.62 (J/K) V = 0.77 (cc) Cp = 2.70 (J/K)

| annite | phlogopite |
|---|---|
| 2.02 | 97.98 |

feldspar mass = 24.68 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.73Ca0.20Al1.20Si2.80O8
G = -395666.80 (J) H = -342251.23 (J) S = 51.70 (J/K) V = 9.43 (cc) Cp = 30.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.87 | 19.95 | 7.18 |

quartz mass = 4.30 (gm) density = 2.60 (gm/cc)
SiO2
G = -69248.47 (J) H = -60600.04 (J) S = 8.37 (J/K) V = 1.65 (cc) Cp = 5.79 (J/K)

apatite mass = 0.32 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4634.45 (J) H = -3972.22 (J) S = 0.64 (J/K) V = 0.11 (cc) Cp = 0.36 (J/K)

Total solids mass = 90.35 (gm) density = 3.21 (gm/cc)
G = -1337885.10 (J) H = -1155566.08 (J) S = 176.47 (J/K) V = 28.18 (cc) Cp = 103.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.87 (gm) density = 3.09 (gm/cc)
G = -1491253.79 (J) H = -1281405.55 (J) S = 203.11 (J/K) V = 32.27 (cc) Cp = 116.80 (J/K)

Oxygen delta moles = -0.00421419 delta grams = -0.134849
G = 964.86 (J) H = -100.54 (J) S = -1.03 (J/K) V = -362.00 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 7.69 (gm) density = 2.30 (gm/cc) viscosity = 2.72 (log 10 poise) (analysis in wt %)
G = -124088.89 (J) H = -101334.89 (J) S = 22.24 (J/K) V = 3.34 (cc) Cp = 10.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 60.53 | 0.10 | 12.63 | 0.13 | 0.00 | 0.38 | 2.36 | 0.12 | 0.00 | 0.00 | 2.90 | 4.99 | 3.09 | 1.42 | 11.36 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 29.65 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.21Fe"0.55Mg0.24)3Al2Si3O12
G = -399550.26 (J) H = -343329.71 (J) S = 54.95 (J/K) V = 7.57 (cc) Cp = 31.78 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.58 | 21.50 | 23.92 |

clinopyroxene mass = 22.66 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.85Fe"0.23Mg0.64Fe'"0.03Ti0.04Al0.24Si1.88O6
G = -336318.60 (J) H = -292109.33 (J) S = 43.21 (J/K) V = 6.77 (cc) Cp = 25.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 49.49 | 5.28 | 23.06 | 9.60 | -1.98 | 4.63 | 9.92 |

clinopyroxene mass = 5.94 (gm) density = 3.56 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.22Mg0.36Fe'"0.03Ti0.41Al0.77Si1.23O6
G = -86684.65 (J) H = -75448.83 (J) S = 10.98 (J/K) V = 1.67 (cc) Cp = 6.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -7.83 | 1.11 | 21.92 | 74.55 | 7.83 | -5.32 | 7.75 |

biotite mass = 3.04 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -48220.46 (J) H = -41543.56 (J) S = 6.53 (J/K) V = 1.10 (cc) Cp = 3.83 (J/K)

| annite | phlogopite |
|---|---|
| 2.16 | 97.84 |

feldspar mass = 25.24 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.07Na0.73Ca0.20Al1.20Si2.80O8
G = -404095.58 (J) H = -350319.64 (J) S = 52.56 (J/K) V = 9.64 (cc) Cp = 31.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.94 | 20.13 | 6.93 |

quartz mass = 5.33 (gm) density = 2.60 (gm/cc)
SiO2
G = -85740.97 (J) H = -75194.80 (J) S = 10.31 (J/K) V = 2.05 (cc) Cp = 7.12 (J/K)

apatite mass = 0.31 (gm) density = 3.06 (gm/cc)

Ca5(PO4)3OH
G = -4512.52 (J)  H = -3876.53 (J)  S = 0.62 (J/K)  V = 0.10 (cc)  Cp = 0.35 (J/K)

Total solids  mass = 92.18 (gm)  density = 3.19 (gm/cc)
G = -1365123.04 (J)  H = -1181822.41 (J)  S = 179.15 (J/K)  V = 28.89 (cc)  Cp = 105.90 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.86 (gm)  density = 3.10 (gm/cc)
G = -1489211.93 (J)  H = -1283157.30 (J)  S = 201.39 (J/K)  V = 32.23 (cc)  Cp = 116.82 (J/K)

Oxygen  delta moles = -0.00425122  delta grams = -0.136034
G = 962.94 (J)  H = -99.94 (J)  S = -1.04 (J/K)  V = -361.64 (cc)  Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 740.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -15.25  delta HM = -5.19  NNO = 0.00  QFM = -0.28  COH = 0.76
IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid  mass = 5.82 (gm)  density = 2.26 (gm/cc)  viscosity = 1.76 (log 10 poise)  (analysis in wt %)
G = -94194.32 (J)  H = -76204.17 (J)  S = 17.76 (J/K)  V = 2.58 (cc)  Cp = 8.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55.68 | 0.06 | 12.16 | 0.14 | 0.00 | 0.40 | 3.12 | 0.10 | 0.00 | 0.00 | 3.67 | 5.73 | 2.48 | 2.08 | 14.39 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 29.76 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.23Fe"0.55Mg0.23)3Al2Si3O12
G = -399908.05 (J)  H = -344435.29 (J)  S = 54.75 (J/K)  V = 7.59 (cc)  Cp = 31.80 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.79 | 22.64 | 22.57 |

clinopyroxene  mass = 21.78 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.10Ca0.85Fe"0.23Mg0.63Fe'"0.03Ti0.04Al0.24Si1.88O6
G = -322803.20 (J)  H = -280979.19 (J)  S = 41.28 (J/K)  V = 6.51 (cc)  Cp = 24.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 49.78 | 4.81 | 23.15 | 9.49 | -2.21 | 4.83 | 10.15 |

clinopyroxene  mass = 6.12 (gm)  density = 3.57 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.22Mg0.35Fe'"0.02Ti0.41Al0.78Si1.22O6
G = -89039.06 (J)  H = -77659.46 (J)  S = 11.23 (J/K)  V = 1.71 (cc)  Cp = 6.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -8.60 | 0.98 | 22.37 | 75.14 | 7.72 | -5.30 | 7.69 |

biotite  mass = 3.89 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -61466.40 (J)  H = -53072.27 (J)  S = 8.29 (J/K)  V = 1.40 (cc)  Cp = 4.89 (J/K)

| annite | phlogopite |
|---|---|
| 2.29 | 97.71 |

feldspar  mass = 25.84 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)

K0.07Na0.73Ca0.20Al1.20Si2.80O8
G = -413252.75 (J) H = -359051.51 (J) S = 53.50 (J/K) V = 9.86 (cc) Cp = 32.11 (J/K)
albite anorthite sanidine
73.02 20.24 6.74

quartz mass = 6.37 (gm) density = 2.61 (gm/cc)
SiO2
G = -102418.79 (J) H = -90013.78 (J) S = 12.24 (J/K) V = 2.44 (cc) Cp = 8.44 (J/K)

apatite mass = 0.29 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -4104.58 (J) H = -3534.11 (J) S = 0.56 (J/K) V = 0.09 (cc) Cp = 0.32 (J/K)

Total solids mass = 94.04 (gm) density = 3.18 (gm/cc)
G = -1392992.83 (J) H = -1208745.59 (J) S = 181.86 (J/K) V = 29.61 (cc) Cp = 108.42 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.10 (gm/cc)
G = -1487187.15 (J) H = -1284949.76 (J) S = 199.61 (J/K) V = 32.19 (cc) Cp = 116.93 (J/K)

Oxygen delta moles = -0.00428909 delta grams = -0.137246
G = 961.05 (J) H = -99.33 (J) S = -1.05 (J/K) V = -361.30 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 730.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.29 COH = 0.72 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 4.41 (gm) density = 2.20 (gm/cc) viscosity = 0.75 (log 10 poise) (analysis in wt %)
G = -71578.34 (J) H = -57215.01 (J) S = 14.32 (J/K) V = 2.00 (cc) Cp = 6.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 48.87 | 0.04 | 11.31 | 0.15 | 0.00 | 0.41 | 4.12 | 0.08 | 0.00 | 0.00 | 5.02 | 6.54 | 1.82 | 3.28 | 18.36 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 29.92 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.24Fe"0.55Mg0.21)3Al2Si3O12
G = -401131.00 (J) H = -346297.08 (J) S = 54.66 (J/K) V = 7.63 (cc) Cp = 31.89 (J/K)
almandine grossular pyrope
54.91 23.64 21.45

clinopyroxene mass = 21.07 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.10Ca0.85Fe"0.23Mg0.62Fe'''0.03Ti0.03Al0.25Si1.88O6
G = -311952.50 (J) H = -272131.28 (J) S = 39.70 (J/K) V = 6.29 (cc) Cp = 23.43 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
50.13 4.42 23.11 9.34 -2.39 4.97 10.42

clinopyroxene mass = 6.25 (gm) density = 3.57 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.23Mg0.34Fe'''0.02Ti0.42Al0.78Si1.22O6
G = -90805.89 (J) H = -79367.37 (J) S = 11.40 (J/K) V = 1.75 (cc) Cp = 6.73 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-9.24 0.87 22.68 75.69 7.68 -5.35 7.67

biotite mass = 4.54 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -71699.95 (J) H = -62046.17 (J) S = 9.62 (J/K) V = 1.64 (cc) Cp = 5.70 (J/K)
annite phlogopite
2.38 97.62

feldspar mass = 26.27 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.73Ca0.20Al1.20Si2.80O8
G = -419631.34 (J) H = -365401.84 (J) S = 54.06 (J/K) V = 10.02 (cc) Cp = 33.02 (J/K)
albite anorthite sanidine
73.32 20.27 6.42

quartz mass = 7.17 (gm) density = 2.61 (gm/cc)
SiO2
G = -115088.79 (J) H = -101364.43 (J) S = 13.68 (J/K) V = 2.75 (cc) Cp = 9.42 (J/K)

apatite mass = 0.23 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -3292.13 (J) H = -2841.00 (J) S = 0.45 (J/K) V = 0.08 (cc) Cp = 0.25 (J/K)

Total solids mass = 95.45 (gm) density = 3.17 (gm/cc)
G = -1413601.60 (J) H = -1229449.17 (J) S = 183.57 (J/K) V = 30.15 (cc) Cp = 110.45 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.11 (gm/cc)
G = -1485179.94 (J) H = -1286664.17 (J) S = 197.89 (J/K) V = 32.15 (cc) Cp = 117.16 (J/K)

Oxygen delta moles = -0.0043273 delta grams = -0.138468
G = 959.06 (J) H = -98.71 (J) S = -1.05 (J/K) V = -360.92 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 720.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.74 delta HM = -5.21 NNO = 0.00 QFM = -0.31 COH = 0.68 IW = 4.81

Constraint Flags: fO2 path = NNO

Liquid mass = 3.74 (gm) density = 2.17 (gm/cc) viscosity = 0.15 (log 10 poise) (analysis in wt %)
G = -60722.39 (J) H = -48214.84 (J) S = 12.59 (J/K) V = 1.72 (cc) Cp = 5.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 43.52 | 0.02 | 10.42 | 0.15 | 0.00 | 0.38 | 4.85 | 0.07 | 0.00 | 0.00 | 6.46 | 6.96 | 1.42 | 4.58 | 21.17 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 30.12 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.24Fe"0.55Mg0.21)3Al2Si3O12
G = -403003.12 (J) H = -348725.82 (J) S = 54.65 (J/K) V = 7.67 (cc) Cp = 32.03 (J/K)
almandine grossular pyrope
54.97 24.41 20.62

clinopyroxene mass = 20.57 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.85Fe"0.23Mg0.62Fe'"0.03Ti0.03Al0.25Si1.88O6
G = -304403.44 (J) H = -266141.08 (J) S = 38.53 (J/K) V = 6.14 (cc) Cp = 22.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 50.62 | 4.10 | 22.88 | 9.15 | -2.53 | 5.05 | 10.72 |

clinopyroxene mass = 6.34 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.23Mg0.34Fe'"0.02Ti0.42Al0.78Si1.22O6
G = -92027.58 (J) H = -80607.47 (J) S = 11.50 (J/K) V = 1.77 (cc) Cp = 6.82 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -9.73 | 0.79 | 22.82 | 76.18 | 7.69 | -5.47 | 7.72 |

biotite mass = 4.97 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -78423.52 (J) H = -68017.71 (J) S = 10.48 (J/K) V = 1.80 (cc) Cp = 6.24 (J/K)

| annite | phlogopite |
|---|---|
| 2.38 | 97.62 |

feldspar mass = 26.35 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.06Na0.74Ca0.20Al1.20Si2.80O8
G = -420467.20 (J) H = -366944.03 (J) S = 53.89 (J/K) V = 10.05 (cc) Cp = 33.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.88 | 20.18 | 5.94 |

quartz mass = 7.60 (gm) density = 2.61 (gm/cc)
SiO2
G = -121752.48 (J) H = -107460.04 (J) S = 14.39 (J/K) V = 2.90 (cc) Cp = 9.90 (J/K)

apatite mass = 0.17 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -2389.74 (J) H = -2066.92 (J) S = 0.33 (J/K) V = 0.05 (cc) Cp = 0.18 (J/K)

Total solids mass = 96.12 (gm) density = 3.16 (gm/cc)
G = -1422467.09 (J) H = -1239963.06 (J) S = 183.76 (J/K) V = 30.40 (cc) Cp = 111.66 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.11 (gm/cc)
G = -1483189.48 (J) H = -1288177.91 (J) S = 196.36 (J/K) V = 32.12 (cc) Cp = 117.51 (J/K)

Oxygen delta moles = -0.00436454 delta grams = -0.13966
G = 956.69 (J) H = -98.04 (J) S = -1.06 (J/K) V = -360.40 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 710.00 (C) P = 8.000 (kbars) log(10) f O2 = -16.00 delta HM = -5.22 NNO = 0.00 QFM = -0.32 COH = 0.64
IW = 4.83

Constraint Flags: fO2 path = NNO

Liquid mass = 3.39 (gm) density = 2.16 (gm/cc) viscosity = -0.23 (log 10 poise) (analysis in wt %)
G = -54804.96 (J) H = -43401.37 (J) S = 11.60 (J/K) V = 1.57 (cc) Cp = 5.41 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
39.32 0.02 9.58 0.14 0.00 0.33 5.36 0.06 0.00 0.00 7.97 7.12 1.16 5.92 23.02 0.00 0.00 0.00 0.00

garnet mass = 30.34 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.25Fe"0.55Mg0.20)3Al2Si3O12
G = -405243.59 (J) H = -351482.25 (J) S = 54.68 (J/K) V = 7.73 (cc) Cp = 32.20 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.98 | 25.09 | 19.92 |

clinopyroxene mass = 20.17 (gm) density = 3.35 (gm/cc) (analysis in mole %)
cpx Na0.11Ca0.85Fe"0.23Mg0.62Fe'"0.02Ti0.03Al0.25Si1.89O6
G = -298308.88 (J) H = -261401.00 (J) S = 37.54 (J/K) V = 6.02 (cc) Cp = 22.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 51.16 | 3.83 | 22.57 | 8.95 | -2.64 | 5.09 | 11.05 |

clinopyroxene mass = 6.42 (gm) density = 3.58 (gm/cc) (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.23Mg0.33Fe'"0.02Ti0.42Al0.79Si1.21O6
G = -93012.62 (J) H = -81645.67 (J) S = 11.56 (J/K) V = 1.79 (cc) Cp = 6.89 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.14 | 0.71 | 22.88 | 76.65 | 7.73 | -5.62 | 7.79 |

biotite mass = 5.31 (gm) density = 2.77 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -83569.94 (J) H = -72645.66 (J) S = 11.11 (J/K) V = 1.91 (cc) Cp = 6.65 (J/K)

| annite | phlogopite |
|---|---|
| 2.35 | 97.65 |

feldspar mass = 26.28 (gm) density = 2.62 (gm/cc) (analysis in mole %)
K0.05Na0.75Ca0.20Al1.20Si2.80O8
G = -418909.77 (J) H = -366399.43 (J) S = 53.41 (J/K) V = 10.02 (cc) Cp = 34.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.54 | 20.01 | 5.45 |

quartz mass = 7.87 (gm) density = 2.62 (gm/cc)
SiO2
G = -125962.31 (J) H = -111408.90 (J) S = 14.80 (J/K) V = 3.00 (cc) Cp = 10.17 (J/K)

apatite mass = 0.10 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -1402.40 (J) H = -1215.69 (J) S = 0.19 (J/K) V = 0.03 (cc) Cp = 0.11 (J/K)

Total solids mass = 96.47 (gm) density = 3.16 (gm/cc)
G = -1426409.51 (J) H = -1246198.60 (J) S = 183.30 (J/K) V = 30.52 (cc) Cp = 112.54 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.86 (gm) density = 3.11 (gm/cc)
G = -1481214.48 (J) H = -1289599.97 (J) S = 194.90 (J/K) V = 32.09 (cc) Cp = 117.95 (J/K)

Oxygen delta moles = -0.00440073 delta grams = -0.140818
G = 953.92 (J) H = -97.32 (J) S = -1.07 (J/K) V = -359.72 (cc) Cp = -0.15 (J/K)

**********----------**********
Title: mafic

T = 700.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -16.26  delta HM = -5.23  NNO = 0.00  QFM = -0.34  COH = 0.60
IW = 4.85

Constraint Flags: fO2 path = NNO

Liquid  mass = 3.17 (gm)  density = 2.15 (gm/cc)  viscosity = -0.52 (log 10 poise)  (analysis in wt %)
G = -51133.26 (J)  H = -40490.77 (J)  S = 10.94 (J/K)  V = 1.47 (cc)  Cp = 5.15 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 35.63 | 0.01 | 8.74 | 0.13 | 0.00 | 0.29 | 5.73 | 0.05 | 0.00 | 0.00 | 9.68 | 7.09 | 0.97 | 7.44 | 24.25 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 30.57 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.26Fe"0.55Mg0.19)3Al2Si3O12
G = -407729.21 (J)  H = -354461.50 (J)  S = 54.74 (J/K)  V = 7.79 (cc)  Cp = 32.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.98 | 25.73 | 19.29 |

clinopyroxene  mass = 19.81 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
cpx Na0.11Ca0.85Fe"0.22Mg0.62Fe'"0.02Ti0.03Al0.25Si1.89O6
G = -293008.13 (J)  H = -257335.98 (J)  S = 36.66 (J/K)  V = 5.92 (cc)  Cp = 21.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| 51.72 | 3.58 | 22.20 | 8.75 | -2.75 | 5.12 | 11.39 |

clinopyroxene  mass = 6.48 (gm)  density = 3.58 (gm/cc)  (analysis in mole %)
cpx Na0.08Ca0.91Fe"0.23Mg0.33Fe'"0.02Ti0.42Al0.79Si1.21O6
G = -93860.34 (J)  H = -82567.24 (J)  S = 11.60 (J/K)  V = 1.81 (cc)  Cp = 6.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -10.50 | 0.65 | 22.88 | 77.10 | 7.78 | -5.78 | 7.87 |

biotite  mass = 5.59 (gm)  density = 2.77 (gm/cc)  (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -87867.15 (J)  H = -76554.49 (J)  S = 11.62 (J/K)  V = 2.01 (cc)  Cp = 6.99 (J/K)

| annite | phlogopite |
|---|---|
| 2.29 | 97.71 |

feldspar  mass = 26.14 (gm)  density = 2.62 (gm/cc)  (analysis in mole %)
K0.05Na0.75Ca0.20Al1.20Si2.80O8
G = -416372.68 (J)  H = -364993.10 (J)  S = 52.80 (J/K)  V = 9.96 (cc)  Cp = 34.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 75.23 | 19.79 | 4.98 |

quartz  mass = 8.07 (gm)  density = 2.62 (gm/cc)
SiO2
G = -129073.40 (J)  H = -114398.33 (J)  S = 15.08 (J/K)  V = 3.08 (cc)  Cp = 10.35 (J/K)

apatite  mass = 0.01 (gm)  density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -210.30 (J)  H = -182.71 (J)  S = 0.03 (J/K)  V = 0.00 (cc)  Cp = 0.02 (J/K)

Total solids  mass = 96.69 (gm)  density = 3.16 (gm/cc)

G = -1428121.22 (J)  H = -1250493.36 (J)  S = 182.53 (J/K)  V = 30.58 (cc)  Cp = 113.16 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.86 (gm)  density = 3.12 (gm/cc)
G = -1479254.49 (J)  H = -1290984.13 (J)  S = 193.46 (J/K)  V = 32.05 (cc)  Cp = 118.31 (J/K)

Oxygen  delta moles = -0.00443586  delta grams = -0.141942
G = 950.76 (J)  H = -96.56 (J)  S = -1.08 (J/K)  V = -358.91 (cc)  Cp = -0.15 (J/K)

**********----------**********
Title: metapelite

T = 1300.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.51  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.51 (log 10 poise)  (analysis in wt %)
G = -1673424.28 (J)  H = -1230221.55 (J)  S = 281.73 (J/K)  V = 40.37 (cc)  Cp = 143.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.07 | 0.00 | 5.74 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.51 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1673424.28 (J)  H = -1230221.55 (J)  S = 281.73 (J/K)  V = 40.37 (cc)  Cp = 143.73 (J/K)

Oxygen  delta moles = 9.36751e-17  delta grams = 2.99749e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1290.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.41  COH = 2.49  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.56 (log 10 poise)  (analysis in wt %)
G = -1670614.03 (J)  H = -1231660.91 (J)  S = 280.81 (J/K)  V = 40.34 (cc)  Cp = 143.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.07 | 0.00 | 5.73 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1670614.03 (J)  H = -1231660.91 (J)  S = 280.81 (J/K)  V = 40.34 (cc)  Cp = 143.73 (J/K)

Oxygen  delta moles = 4.47036e-06  delta grams = 0.000143046
G = -1.62 (J)  H = 0.19 (J)  S = 0.00 (J/K)  V = 0.58 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1280.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.48  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1667813.21 (J)  H = -1233100.42 (J)  S = 279.89 (J/K)  V = 40.31 (cc)  Cp = 143.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.08 | 0.00 | 5.73 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1667813.21 (J)  H = -1233100.42 (J)  S = 279.89 (J/K)  V = 40.31 (cc)  Cp = 143.72 (J/K)

Oxygen  delta moles = 9.40261e-06  delta grams = 0.000300872
G = -3.39 (J)  H = 0.40 (J)  S = 0.00 (J/K)  V = 1.21 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1270.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.40  COH = 2.46  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.67 (log 10 poise)  (analysis in wt %)
G = -1665021.91 (J)  H = -1234540.10 (J)  S = 278.96 (J/K)  V = 40.27 (cc)  Cp = 143.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.08 | 0.00 | 5.73 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.67 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1665021.91 (J)  H = -1234540.10 (J)  S = 278.96 (J/K)  V = 40.27 (cc)  Cp = 143.72 (J/K)

Oxygen  delta moles = 1.48099e-05  delta grams = 0.0004739
G = -5.30 (J)  H = 0.62 (J)  S = 0.00 (J/K)  V = 1.90 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1260.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.45  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.48 (gm/cc)  viscosity = 3.72 (log 10 poise)  (analysis in wt %)
G = -1662240.18 (J)  H = -1235979.94 (J)  S = 278.03 (J/K)  V = 40.24 (cc)  Cp = 143.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.08 | 0.00 | 5.73 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.72 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.48 (gm/cc)
G = -1662240.18 (J)  H = -1235979.94 (J)  S = 278.03 (J/K)  V = 40.24 (cc)  Cp = 143.71 (J/K)

Oxygen  delta moles = 2.0706e-05  delta grams = 0.000662567
G = -7.35 (J)  H = 0.87 (J)  S = 0.01 (J/K)  V = 2.64 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1250.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.39  COH = 2.43  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.49 (gm/cc)  viscosity = 3.78 (log 10 poise)  (analysis in wt %)
G = -1659468.10 (J)  H = -1237419.97 (J)  S = 277.09 (J/K)  V = 40.21 (cc)  Cp = 143.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.08 | 0.00 | 5.73 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.78 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.49 (gm/cc)
G = -1659468.10 (J)  H = -1237419.97 (J)  S = 277.09 (J/K)  V = 40.21 (cc)  Cp = 143.70 (J/K)

Oxygen  delta moles = 2.71052e-05  delta grams = 0.000867332
G = -9.55 (J)  H = 1.12 (J)  S = 0.01 (J/K)  V = 3.43 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1240.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.38  COH = 2.42  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 3.83 (log 10 poise) (analysis in wt %)
G = -1656705.72 (J) H = -1238860.20 (J) S = 276.14 (J/K) V = 40.18 (cc) Cp = 143.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.08 | 0.00 | 5.73 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.83 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1656705.72 (J) H = -1238860.20 (J) S = 276.14 (J/K) V = 40.18 (cc) Cp = 143.70 (J/K)

Oxygen delta moles = 3.40223e-05 delta grams = 0.00108867
G = -11.90 (J) H = 1.40 (J) S = 0.01 (J/K) V = 4.28 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1230.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.38 COH = 2.40 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 100.00 (gm) density = 2.49 (gm/cc) viscosity = 3.89 (log 10 poise) (analysis in wt %)
G = -1653953.13 (J) H = -1240300.62 (J) S = 275.19 (J/K) V = 40.15 (cc) Cp = 143.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.79 | 16.91 | 1.09 | 0.00 | 5.72 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.92 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids mass = 0.00 (gm) density = 0.00 (gm/cc)
G = 0.00 (J) H = 0.00 (J) S = 0.00 (J/K) V = 0.00 (cc) Cp = 0.00 (J/K)

Viscosity of the System: 3.89 (log 10 poise)

System mass = 100.00 (gm) density = 2.49 (gm/cc)
G = -1653953.13 (J) H = -1240300.62 (J) S = 275.19 (J/K) V = 40.15 (cc) Cp = 143.69 (J/K)

Oxygen delta moles = 4.1473e-05 delta grams = 0.00132709
G = -14.40 (J) H = 1.69 (J) S = 0.01 (J/K) V = 5.18 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1220.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.37 COH = 2.39 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 99.03 (gm) density = 2.49 (gm/cc) viscosity = 3.99 (log 10 poise) (analysis in wt %)
G = -1635990.74 (J) H = -1230437.41 (J) S = 271.61 (J/K) V = 39.78 (cc) Cp = 142.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.51 | 0.80 | 17.05 | 1.08 | 0.00 | 5.64 | 0.06 | 2.69 | 0.00 | 0.00 | 1.54 | 2.56 | 3.96 | 0.09 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.97 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.45Mg1.46Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -15201.74 (J) H = -11680.29 (J) S = 2.36 (J/K) V = 0.29 (cc) Cp = 1.21 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -51.72 | 98.74 | 45.44 | 4.22 | -3.80 | 6.95 | 0.16 |

Total solids mass = 0.97 (gm) density = 3.29 (gm/cc)
G = -15201.74 (J) H = -11680.29 (J) S = 2.36 (J/K) V = 0.29 (cc) Cp = 1.21 (J/K)

Viscosity of the System: 4.00 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1651192.48 (J) H = -1242117.71 (J) S = 273.97 (J/K) V = 40.08 (cc) Cp = 143.34 (J/K)

Oxygen delta moles = 1.41759e-05 delta grams = 0.00045361
G = -4.89 (J) H = 0.57 (J) S = 0.00 (J/K) V = 1.76 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1210.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.37 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 98.29 (gm) density = 2.49 (gm/cc) viscosity = 4.08 (log 10 poise) (analysis in wt %)
G = -1621778.10 (J) H = -1223313.89 (J) S = 268.66 (J/K) V = 39.50 (cc) Cp = 140.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.59 | 0.81 | 17.15 | 1.07 | 0.00 | 5.57 | 0.06 | 2.51 | 0.00 | 0.00 | 1.55 | 2.58 | 3.99 | 0.09 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.71 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.47Mg1.44Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -26668.18 (J) H = -20524.71 (J) S = 4.14 (J/K) V = 0.52 (cc) Cp = 2.13 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.56 | 98.68 | 47.16 | 4.33 | -3.90 | 7.12 | 0.17 |

Total solids mass = 1.71 (gm) density = 3.30 (gm/cc)
G = -26668.18 (J) H = -20524.71 (J) S = 4.14 (J/K) V = 0.52 (cc) Cp = 2.13 (J/K)

Viscosity of the System: 4.10 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1648446.28 (J) H = -1243838.60 (J) S = 272.80 (J/K) V = 40.01 (cc) Cp = 143.07 (J/K)

Oxygen delta moles = -7.98329e-06 delta grams = -0.000255456
G = 2.73 (J) H = -0.32 (J) S = -0.00 (J/K) V = -0.98 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1200.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.37 COH = 2.35 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 97.57 (gm) density = 2.49 (gm/cc) viscosity = 4.17 (log 10 poise) (analysis in wt %)
G = -1608026.48 (J) H = -1216449.96 (J) S = 265.81 (J/K) V = 39.22 (cc) Cp = 133.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.67 | 0.81 | 17.26 | 1.06 | 0.00 | 5.49 | 0.06 | 2.35 | 0.00 | 0.00 | 1.56 | 2.60 | 4.02 | 0.09 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.43 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.49Mg1.42Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -37683.97 (J) H = -29050.65 (J) S = 5.86 (J/K) V = 0.73 (cc) Cp = 3.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.46 | 98.62 | 48.93 | 4.45 | -4.02 | 7.30 | 0.18 |

Total solids mass = 2.43 (gm) density = 3.31 (gm/cc)
G = -37683.97 (J) H = -29050.65 (J) S = 5.86 (J/K) V = 0.73 (cc) Cp = 3.02 (J/K)

Viscosity of the System: 4.20 (log 10 poise)

System mass = 100.00 (gm) density = 2.50 (gm/cc)
G = -1645710.45 (J) H = -1245500.60 (J) S = 271.67 (J/K) V = 39.95 (cc) Cp = 136.28 (J/K)

Oxygen delta moles = -3.22721e-05 delta grams = -0.00103267
G = 10.96 (J) H = -1.28 (J) S = -0.01 (J/K) V = -3.95 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1190.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.34 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 96.86 (gm) density = 2.49 (gm/cc) viscosity = 4.26 (log 10 poise) (analysis in wt %)
G = -1594688.97 (J) H = -1209837.62 (J) S = 263.03 (J/K) V = 38.95 (cc) Cp = 132.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.75 | 0.82 | 17.36 | 1.05 | 0.00 | 5.40 | 0.06 | 2.19 | 0.00 | 0.00 | 1.57 | 2.62 | 4.05 | 0.09 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.14 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.51Mg1.40Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -48295.58 (J) H = -37291.92 (J) S = 7.52 (J/K) V = 0.94 (cc) Cp = 3.88 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-57.42 98.55 50.77 4.57 -4.14 7.48 0.18

Total solids mass = 3.14 (gm) density = 3.32 (gm/cc)
G = -48295.58 (J) H = -37291.92 (J) S = 7.52 (J/K) V = 0.94 (cc) Cp = 3.88 (J/K)

Viscosity of the System: 4.30 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1642984.55 (J) H = -1247129.54 (J) S = 270.55 (J/K) V = 39.89 (cc) Cp = 136.03 (J/K)

Oxygen delta moles = -5.89274e-05 delta grams = -0.00188561
G = 19.86 (J) H = -2.31 (J) S = -0.02 (J/K) V = -7.17 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1180.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.36 COH = 2.32 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 96.17 (gm) density = 2.49 (gm/cc) viscosity = 4.35 (log 10 poise) (analysis in wt %)
G = -1581729.00 (J) H = -1203472.18 (J) S = 260.30 (J/K) V = 38.68 (cc) Cp = 131.09 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
63.84 0.82 17.46 1.04 0.00 5.30 0.06 2.04 0.00 0.00 1.58 2.64 4.08 0.09 1.05 0.00 0.00 0.00 0.00

orthopyroxene mass = 3.82 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.53Mg1.38Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -58539.44 (J) H = -45274.91 (J) S = 9.13 (J/K) V = 1.15 (cc) Cp = 4.71 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-59.43 98.49 52.65 4.70 -4.26 7.66 0.19

Total solids mass = 3.82 (gm) density = 3.33 (gm/cc)
G = -58539.44 (J) H = -45274.91 (J) S = 9.13 (J/K) V = 1.15 (cc) Cp = 4.71 (J/K)

Viscosity of the System: 4.41 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1640268.44 (J) H = -1248747.09 (J) S = 269.43 (J/K) V = 39.83 (cc) Cp = 135.80 (J/K)

Oxygen delta moles = -8.81684e-05 delta grams = -0.00282128
G = 29.48 (J) H = -3.43 (J) S = -0.02 (J/K) V = -10.65 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1170.00 (C) P = 5.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.35 COH = 2.30 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 95.50 (gm) density = 2.49 (gm/cc) viscosity = 4.45 (log 10 poise) (analysis in wt %)
G = -1569113.62 (J) H = -1197330.68 (J) S = 257.62 (J/K) V = 38.42 (cc) Cp = 130.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.93 | 0.83 | 17.56 | 1.02 | 0.00 | 5.20 | 0.06 | 1.89 | 0.00 | 0.00 | 1.59 | 2.65 | 4.11 | 0.09 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.50 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.55Mg1.36Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -68448.39 (J) H = -53023.53 (J) S = 10.69 (J/K) V = 1.35 (cc) Cp = 5.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.50 | 98.42 | 54.59 | 4.83 | -4.39 | 7.85 | 0.20 |

Total solids mass = 4.50 (gm) density = 3.34 (gm/cc)
G = -68448.39 (J) H = -53023.53 (J) S = 10.69 (J/K) V = 1.35 (cc) Cp = 5.52 (J/K)

Viscosity of the System: 4.51 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1637562.01 (J) H = -1250354.20 (J) S = 268.31 (J/K) V = 39.77 (cc) Cp = 135.57 (J/K)

Oxygen delta moles = -0.000120207 delta grams = -0.00384649
G = 39.89 (J) H = -4.63 (J) S = -0.03 (J/K) V = -14.42 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1160.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.35 COH = 2.29 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 94.83 (gm) density = 2.48 (gm/cc) viscosity = 4.54 (log 10 poise) (analysis in wt %)
G = -1556813.23 (J) H = -1191392.34 (J) S = 254.98 (J/K) V = 38.17 (cc) Cp = 129.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.02 | 0.83 | 17.66 | 1.01 | 0.00 | 5.09 | 0.06 | 1.76 | 0.00 | 0.00 | 1.59 | 2.67 | 4.14 | 0.10 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.16 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.57Mg1.33Fe'"0.04Ti0.00Al0.13Si1.92O6
G = -78051.96 (J) H = -60559.38 (J) S = 12.21 (J/K) V = 1.54 (cc) Cp = 6.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.62 | 98.35 | 56.57 | 4.97 | -4.53 | 8.05 | 0.21 |

Total solids mass = 5.16 (gm) density = 3.35 (gm/cc)
G = -78051.96 (J) H = -60559.38 (J) S = 12.21 (J/K) V = 1.54 (cc) Cp = 6.32 (J/K)

Viscosity of the System: 4.61 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1634865.19 (J) H = -1251951.72 (J) S = 267.18 (J/K) V = 39.71 (cc) Cp = 135.34 (J/K)

Oxygen delta moles = -0.000155245 delta grams = -0.00496767

G = 51.12 (J)  H = -5.92 (J)  S = -0.04 (J/K)  V = -18.50 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1150.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.34  COH = 2.27  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.18 (gm)  density = 2.48 (gm/cc)  viscosity = 4.64 (log 10 poise)  (analysis in wt %)
G = -1544801.82 (J)  H = -1185638.76 (J)  S = 252.37 (J/K)  V = 37.92 (cc)  Cp = 128.03 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.12 | 0.84 | 17.76 | 0.99 | 0.00 | 4.97 | 0.06 | 1.63 | 0.00 | 0.00 | 1.60 | 2.69 | 4.17 | 0.10 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.82 (gm)  density = 3.36 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.59Mg1.31Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -87376.08 (J)  H = -67901.61 (J)  S = 13.68 (J/K)  V = 1.73 (cc)  Cp = 7.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.79 | 98.28 | 58.59 | 5.12 | -4.67 | 8.26 | 0.21 |

Total solids  mass = 5.82 (gm)  density = 3.36 (gm/cc)
G = -87376.08 (J)  H = -67901.61 (J)  S = 13.68 (J/K)  V = 1.73 (cc)  Cp = 7.09 (J/K)

Viscosity of the System: 4.72 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.52 (gm/cc)
G = -1632177.89 (J)  H = -1253540.37 (J)  S = 266.06 (J/K)  V = 39.65 (cc)  Cp = 135.12 (J/K)

Oxygen  delta moles = -0.000193464  delta grams = -0.00619062
G = 63.21 (J)  H = -7.31 (J)  S = -0.05 (J/K)  V = -22.89 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1140.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.34  COH = 2.25  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 93.53 (gm)  density = 2.48 (gm/cc)  viscosity = 4.74 (log 10 poise)  (analysis in wt %)
G = -1533057.27 (J)  H = -1180054.14 (J)  S = 249.80 (J/K)  V = 37.68 (cc)  Cp = 127.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.22 | 0.84 | 17.85 | 0.98 | 0.00 | 4.85 | 0.06 | 1.51 | 0.00 | 0.00 | 1.61 | 2.71 | 4.20 | 0.10 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 6.46 (gm)  density = 3.37 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.61Mg1.29Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -96442.81 (J)  H = -75066.60 (J)  S = 15.13 (J/K)  V = 1.92 (cc)  Cp = 7.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.99 | 98.21 | 60.64 | 5.28 | -4.83 | 8.47 | 0.22 |

Total solids mass = 6.46 (gm) density = 3.37 (gm/cc)
G = -96442.81 (J) H = -75066.60 (J) S = 15.13 (J/K) V = 1.92 (cc) Cp = 7.85 (J/K)

Viscosity of the System: 4.83 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1629500.08 (J) H = -1255120.74 (J) S = 264.93 (J/K) V = 39.60 (cc) Cp = 134.90 (J/K)

Oxygen delta moles = -0.00023502 delta grams = -0.00752035
G = 76.18 (J) H = -8.79 (J) S = -0.06 (J/K) V = -27.61 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1130.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.33 COH = 2.23 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 92.89 (gm) density = 2.48 (gm/cc) viscosity = 4.84 (log 10 poise) (analysis in wt %)
G = -1521561.62 (J) H = -1174625.48 (J) S = 247.26 (J/K) V = 37.44 (cc) Cp = 126.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.32 | 0.85 | 17.95 | 0.96 | 0.00 | 4.71 | 0.07 | 1.40 | 0.00 | 0.00 | 1.62 | 2.73 | 4.23 | 0.10 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.10 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.63Mg1.26Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -105270.11 (J) H = -82067.85 (J) S = 16.54 (J/K) V = 2.10 (cc) Cp = 8.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -70.22 | 98.14 | 62.71 | 5.44 | -4.99 | 8.69 | 0.23 |

Total solids mass = 7.10 (gm) density = 3.38 (gm/cc)
G = -105270.11 (J) H = -82067.85 (J) S = 16.54 (J/K) V = 2.10 (cc) Cp = 8.59 (J/K)

Viscosity of the System: 4.94 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1626831.73 (J) H = -1256693.32 (J) S = 263.79 (J/K) V = 39.54 (cc) Cp = 134.68 (J/K)

Oxygen delta moles = -0.000280033 delta grams = -0.00896072
G = 90.06 (J) H = -10.38 (J) S = -0.07 (J/K) V = -32.67 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1120.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.22 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 92.26 (gm) density = 2.48 (gm/cc) viscosity = 4.94 (log 10 poise) (analysis in wt %)
G = -1510301.31 (J) H = -1169342.78 (J) S = 244.74 (J/K) V = 37.20 (cc) Cp = 125.15 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.42 0.85 18.04 0.94 0.00 4.57 0.07 1.30 0.00 0.00 1.62 2.75 4.25 0.10 1.09 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.73 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.65Mg1.24Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -113871.53 (J) H = -88915.66 (J) S = 17.91 (J/K) V = 2.28 (cc) Cp = 9.32 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-72.47 98.07 64.80 5.61 -5.16 8.91 0.24

Total solids mass = 7.73 (gm) density = 3.39 (gm/cc)
G = -113871.53 (J) H = -88915.66 (J) S = 17.91 (J/K) V = 2.28 (cc) Cp = 9.32 (J/K)

Viscosity of the System: 5.05 (log 10 poise)

System mass = 99.99 (gm) density = 2.53 (gm/cc)
G = -1624172.84 (J) H = -1258258.44 (J) S = 262.65 (J/K) V = 39.48 (cc) Cp = 134.47 (J/K)

Oxygen delta moles = -0.000328583 delta grams = -0.0105143
G = 104.83 (J) H = -12.06 (J) S = -0.08 (J/K) V = -38.06 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1110.00 (C) P = 5.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.32 COH = 2.20 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 91.63 (gm) density = 2.48 (gm/cc) viscosity = 5.04 (log 10 poise) (analysis in wt %)
G = -1499267.28 (J) H = -1164199.18 (J) S = 242.25 (J/K) V = 36.97 (cc) Cp = 124.22 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.53 0.86 18.13 0.91 0.00 4.42 0.07 1.20 0.00 0.00 1.63 2.76 4.28 0.10 1.10 0.00 0.00 0.00 0.00

orthopyroxene mass = 8.35 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.67Mg1.21Fe'"0.04Ti0.00Al0.15Si1.90O6
G = -122256.15 (J) H = -95617.10 (J) S = 19.26 (J/K) V = 2.46 (cc) Cp = 10.04 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-74.72 98.00 66.88 5.80 -5.34 9.15 0.24

Total solids mass = 8.35 (gm) density = 3.40 (gm/cc)
G = -122256.15 (J) H = -95617.10 (J) S = 19.26 (J/K) V = 2.46 (cc) Cp = 10.04 (J/K)

Viscosity of the System: 5.16 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1621523.44 (J) H = -1259816.28 (J) S = 261.51 (J/K) V = 39.43 (cc) Cp = 134.26 (J/K)

Oxygen delta moles = -0.000380699 delta grams = -0.0121819
G = 120.49 (J) H = -13.83 (J) S = -0.10 (J/K) V = -43.78 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1100.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.31  COH = 2.18  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 91.02 (gm)  density = 2.48 (gm/cc)  viscosity = 5.15 (log 10 poise)  (analysis in wt %)
G = -1488454.97 (J)  H = -1159190.94 (J)  S = 239.79 (J/K)  V = 36.74 (cc)  Cp = 123.31 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.65 | 0.87 | 18.23 | 0.89 | 0.00 | 4.26 | 0.07 | 1.11 | 0.00 | 0.00 | 1.64 | 2.78 | 4.31 | 0.10 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.97 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.69Mg1.19Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -130428.62 (J)  H = -102175.97 (J)  S = 20.58 (J/K)  V = 2.63 (cc)  Cp = 10.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.97 | 97.93 | 68.95 | 5.99 | -5.53 | 9.39 | 0.25 |

Total solids  mass = 8.97 (gm)  density = 3.41 (gm/cc)
G = -130428.62 (J)  H = -102175.97 (J)  S = 20.58 (J/K)  V = 2.63 (cc)  Cp = 10.74 (J/K)

Viscosity of the System: 5.27 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.54 (gm/cc)
G = -1618883.59 (J)  H = -1261366.91 (J)  S = 260.36 (J/K)  V = 39.37 (cc)  Cp = 134.05 (J/K)

Oxygen  delta moles = -0.000436357  delta grams = -0.0139629
G = 136.99 (J)  H = -15.70 (J)  S = -0.11 (J/K)  V = -49.82 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1090.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -8.93  delta HM = -4.91  NNO = 0.00  QFM = 0.31  COH = 2.16  IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid  mass = 90.41 (gm)  density = 2.48 (gm/cc)  viscosity = 5.25 (log 10 poise)  (analysis in wt %)
G = -1477864.10 (J)  H = -1154317.37 (J)  S = 237.35 (J/K)  V = 36.52 (cc)  Cp = 122.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.76 | 0.87 | 18.31 | 0.86 | 0.00 | 4.10 | 0.07 | 1.02 | 0.00 | 0.00 | 1.64 | 2.80 | 4.34 | 0.10 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.58 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.71Mg1.17Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -138389.30 (J)  H = -108592.87 (J)  S = 21.86 (J/K)  V = 2.80 (cc)  Cp = 11.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.20 | 97.86 | 70.99 | 6.19 | -5.73 | 9.64 | 0.26 |

Total solids  mass = 9.58 (gm)  density = 3.42 (gm/cc)

G = -138389.30 (J)  H = -108592.87 (J)  S = 21.86 (J/K)  V = 2.80 (cc)  Cp = 11.43 (J/K)

Viscosity of the System: 5.39 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.54 (gm/cc)
G = -1616253.39 (J)  H = -1262910.24 (J)  S = 259.21 (J/K)  V = 39.32 (cc)  Cp = 133.85 (J/K)

Oxygen  delta moles = -0.000495474  delta grams = -0.0158546
G = 154.29 (J)  H = -17.64 (J)  S = -0.13 (J/K)  V = -56.16 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1080.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.30  COH = 2.14  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.80 (gm)  density = 2.47 (gm/cc)  viscosity = 5.36 (log 10 poise)  (analysis in wt %)
G = -1467498.22 (J)  H = -1149580.56 (J)  S = 234.95 (J/K)  V = 36.30 (cc)  Cp = 121.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.88 | 0.88 | 18.40 | 0.84 | 0.00 | 3.93 | 0.07 | 0.94 | 0.00 | 0.00 | 1.65 | 2.82 | 4.37 | 0.10 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.18 (gm)  density = 3.43 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.73Mg1.14Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -146134.75 (J)  H = -114865.52 (J)  S = 23.11 (J/K)  V = 2.96 (cc)  Cp = 12.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.40 | 97.79 | 72.99 | 6.40 | -5.94 | 9.89 | 0.27 |

Total solids  mass = 10.18 (gm)  density = 3.43 (gm/cc)
G = -146134.75 (J)  H = -114865.52 (J)  S = 23.11 (J/K)  V = 2.96 (cc)  Cp = 12.11 (J/K)

Viscosity of the System: 5.50 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.55 (gm/cc)
G = -1613632.97 (J)  H = -1264446.08 (J)  S = 258.05 (J/K)  V = 39.26 (cc)  Cp = 133.65 (J/K)

Oxygen  delta moles = -0.000557907  delta grams = -0.0178524
G = 172.31 (J)  H = -19.66 (J)  S = -0.14 (J/K)  V = -62.77 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1070.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.30  COH = 2.12  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.21 (gm)  density = 2.47 (gm/cc)  viscosity = 5.47 (log 10 poise)  (analysis in wt %)
G = -1457364.14 (J)  H = -1144984.97 (J)  S = 232.57 (J/K)  V = 36.08 (cc)  Cp = 120.68 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

65.01 0.88 18.49 0.81 0.00 3.76 0.07 0.87 0.00 0.00 1.65 2.84 4.40 0.10 1.13 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.77 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.75Mg1.12Fe'"0.04Ti0.00Al0.17Si1.89O6
G = -153658.34 (J) H = -120989.17 (J) S = 24.32 (J/K) V = 3.13 (cc) Cp = 12.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.56 | 97.73 | 74.95 | 6.62 | -6.16 | 10.14 | 0.27 |

Total solids mass = 10.77 (gm) density = 3.44 (gm/cc)
G = -153658.34 (J) H = -120989.17 (J) S = 24.32 (J/K) V = 3.13 (cc) Cp = 12.77 (J/K)

Viscosity of the System: 5.62 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1611022.48 (J) H = -1265974.13 (J) S = 256.89 (J/K) V = 39.21 (cc) Cp = 133.45 (J/K)

Oxygen delta moles = -0.000623458 delta grams = -0.0199499
G = 190.97 (J) H = -21.75 (J) S = -0.16 (J/K) V = -69.62 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1060.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.29 COH = 2.10 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 88.63 (gm) density = 2.47 (gm/cc) viscosity = 5.58 (log 10 poise) (analysis in wt %)
G = -1447471.09 (J) H = -1140536.90 (J) S = 230.23 (J/K) V = 35.87 (cc) Cp = 119.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.13 | 0.89 | 18.57 | 0.78 | 0.00 | 3.58 | 0.07 | 0.80 | 0.00 | 0.00 | 1.66 | 2.86 | 4.43 | 0.10 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 11.35 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.77Mg1.10Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -160951.01 (J) H = -126957.14 (J) S = 25.50 (J/K) V = 3.29 (cc) Cp = 13.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.65 | 97.67 | 76.83 | 6.85 | -6.39 | 10.40 | 0.28 |

Total solids mass = 11.35 (gm) density = 3.45 (gm/cc)
G = -160951.01 (J) H = -126957.14 (J) S = 25.50 (J/K) V = 3.29 (cc) Cp = 13.41 (J/K)

Viscosity of the System: 5.74 (log 10 poise)

System mass = 99.98 (gm) density = 2.55 (gm/cc)
G = -1608422.10 (J) H = -1267494.04 (J) S = 255.73 (J/K) V = 39.16 (cc) Cp = 133.25 (J/K)

Oxygen delta moles = -0.000691874 delta grams = -0.0221391
G = 210.17 (J) H = -23.89 (J) S = -0.18 (J/K) V = -76.69 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1050.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.29  COH = 2.08  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 88.06 (gm)  density = 2.47 (gm/cc)  viscosity = 5.69 (log 10 poise)  (analysis in wt %)
G = -1437829.77 (J)  H = -1136243.89 (J)  S = 227.93 (J/K)  V = 35.66 (cc)  Cp = 119.02 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.25 | 0.89 | 18.65 | 0.75 | 0.00 | 3.40 | 0.07 | 0.74 | 0.00 | 0.00 | 1.67 | 2.87 | 4.46 | 0.10 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.91 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.79Mg1.08Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -168002.26 (J)  H = -132761.51 (J)  S = 26.63 (J/K)  V = 3.44 (cc)  Cp = 14.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.68 | 97.61 | 78.65 | 7.09 | -6.62 | 10.66 | 0.29 |

Total solids  mass = 11.91 (gm)  density = 3.46 (gm/cc)
G = -168002.26 (J)  H = -132761.51 (J)  S = 26.63 (J/K)  V = 3.44 (cc)  Cp = 14.04 (J/K)

Viscosity of the System: 5.86 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.56 (gm/cc)
G = -1605832.03 (J)  H = -1269005.40 (J)  S = 254.56 (J/K)  V = 39.10 (cc)  Cp = 133.06 (J/K)

Oxygen  delta moles = -0.000762857  delta grams = -0.0244105
G = 229.80 (J)  H = -26.06 (J)  S = -0.19 (J/K)  V = -83.92 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1040.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.28  COH = 2.06  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 87.51 (gm)  density = 2.47 (gm/cc)  viscosity = 5.81 (log 10 poise)  (analysis in wt %)
G = -1428451.44 (J)  H = -1132114.02 (J)  S = 225.67 (J/K)  V = 35.46 (cc)  Cp = 118.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.38 | 0.90 | 18.73 | 0.72 | 0.00 | 3.22 | 0.07 | 0.68 | 0.00 | 0.00 | 1.67 | 2.89 | 4.49 | 0.10 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.47 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.80Mg1.06Fe'"0.04Ti0.00Al0.19Si1.89O6
G = -174801.05 (J)  H = -138393.80 (J)  S = 27.73 (J/K)  V = 3.59 (cc)  Cp = 14.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.63 | 97.55 | 80.39 | 7.34 | -6.86 | 10.92 | 0.30 |

Total solids  mass = 12.47 (gm)  density = 3.47 (gm/cc)
G = -174801.05 (J)  H = -138393.80 (J)  S = 27.73 (J/K)  V = 3.59 (cc)  Cp = 14.65 (J/K)

Viscosity of the System: 5.98 (log 10 poise)

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1603252.49 (J) H = -1270507.82 (J) S = 253.39 (J/K) V = 39.05 (cc) Cp = 132.87 (J/K)

Oxygen delta moles = -0.000836075 delta grams = -0.0267534
G = 249.74 (J) H = -28.26 (J) S = -0.21 (J/K) V = -91.28 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1030.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.27 COH = 2.04 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 86.77 (gm) density = 2.47 (gm/cc) viscosity = 5.92 (log 10 poise) (analysis in wt %)
G = -1416062.66 (J) H = -1125537.29 (J) S = 222.94 (J/K) V = 35.18 (cc) Cp = 117.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.52 | 0.90 | 18.80 | 0.69 | 0.00 | 3.04 | 0.07 | 0.63 | 0.00 | 0.00 | 1.67 | 2.90 | 4.52 | 0.10 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.02 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.82Mg1.04Fe"'0.04Ti0.00Al0.19Si1.88O6
G = -181545.18 (J) H = -144006.71 (J) S = 28.81 (J/K) V = 3.74 (cc) Cp = 15.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.57 | 97.51 | 82.10 | 7.58 | -7.10 | 11.17 | 0.30 |

feldspar mass = 0.18 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.65Ca0.29Al1.29Si2.71O8
G = -3073.81 (J) H = -2507.65 (J) S = 0.43 (J/K) V = 0.07 (cc) Cp = 0.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.43 | 28.88 | 5.69 |

Total solids mass = 13.20 (gm) density = 3.46 (gm/cc)
G = -184618.98 (J) H = -146514.37 (J) S = 29.24 (J/K) V = 3.81 (cc) Cp = 15.48 (J/K)

Viscosity of the System: 6.11 (log 10 poise)

System mass = 99.97 (gm) density = 2.56 (gm/cc)
G = -1600681.64 (J) H = -1272051.66 (J) S = 252.18 (J/K) V = 39.00 (cc) Cp = 132.65 (J/K)

Oxygen delta moles = -0.000915015 delta grams = -0.0292794
G = 271.00 (J) H = -30.60 (J) S = -0.23 (J/K) V = -99.14 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1020.00 (C) P = 5.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.27 COH = 2.02 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 83.48 (gm) density = 2.46 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -1361929.89 (J) H = -1085539.40 (J) S = 213.73 (J/K) V = 33.91 (cc) Cp = 112.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.83 | 0.94 | 18.75 | 0.65 | 0.00 | 2.86 | 0.07 | 0.57 | 0.00 | 0.00 | 1.56 | 2.78 | 4.67 | 0.11 | 1.21 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.76 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.85Mg1.01Fe'"0.04Ti0.00Al0.19Si1.88O6
G = -190488.01 (J) H = -151341.88 (J) S = 30.27 (J/K) V = 3.94 (cc) Cp = 16.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.34 | 97.68 | 84.55 | 7.72 | -7.23 | 11.33 | 0.30 |

feldspar mass = 2.73 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.66Ca0.28Al1.28Si2.72O8
G = -45680.49 (J) H = -37345.44 (J) S = 6.45 (J/K) V = 1.05 (cc) Cp = 3.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.29 | 27.62 | 6.09 |

Total solids mass = 16.49 (gm) density = 3.30 (gm/cc)
G = -236168.50 (J) H = -188687.32 (J) S = 36.72 (J/K) V = 4.99 (cc) Cp = 19.42 (J/K)

Viscosity of the System: 6.30 (log 10 poise)

System mass = 99.97 (gm) density = 2.57 (gm/cc)
G = -1598098.39 (J) H = -1274226.72 (J) S = 250.45 (J/K) V = 38.90 (cc) Cp = 131.98 (J/K)

Oxygen delta moles = -0.00104473 delta grams = -0.0334302
G = 306.78 (J) H = -34.56 (J) S = -0.26 (J/K) V = -112.33 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1010.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.26 COH = 2.00 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 80.40 (gm) density = 2.46 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -1311315.79 (J) H = -1048124.38 (J) S = 205.11 (J/K) V = 32.72 (cc) Cp = 108.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.13 | 0.97 | 18.71 | 0.61 | 0.00 | 2.68 | 0.08 | 0.52 | 0.00 | 0.00 | 1.47 | 2.65 | 4.81 | 0.11 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.44 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.87Mg0.99Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -198602.20 (J) H = -158059.76 (J) S = 31.60 (J/K) V = 4.12 (cc) Cp = 16.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.85 | 97.83 | 86.77 | 7.87 | -7.37 | 11.47 | 0.29 |

feldspar mass = 5.12 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.67Ca0.26Al1.26Si2.74O8
G = -85616.10 (J) H = -70143.31 (J) S = 12.06 (J/K) V = 1.97 (cc) Cp = 6.28 (J/K)

albite anorthite sanidine
67.01 26.50 6.50

Total solids mass = 19.56 (gm) density = 3.21 (gm/cc)
G = -284218.29 (J) H = -228203.06 (J) S = 43.65 (J/K) V = 6.10 (cc) Cp = 23.09 (J/K)

Viscosity of the System: 6.49 (log 10 poise)

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1595534.08 (J) H = -1276327.44 (J) S = 248.77 (J/K) V = 38.81 (cc) Cp = 131.36 (J/K)

Oxygen delta moles = -0.00117117 delta grams = -0.0374761
G = 340.95 (J) H = -38.32 (J) S = -0.30 (J/K) V = -124.95 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1000.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.25 COH = 1.98 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 77.53 (gm) density = 2.45 (gm/cc) viscosity = 6.28 (log 10 poise) (analysis in wt %)
G = -1264210.14 (J) H = -1013300.07 (J) S = 197.08 (J/K) V = 31.60 (cc) Cp = 104.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.42 | 1.01 | 18.68 | 0.58 | 0.00 | 2.50 | 0.08 | 0.48 | 0.00 | 0.00 | 1.38 | 2.52 | 4.95 | 0.12 | 1.30 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 15.07 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.89Mg0.97Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -205918.32 (J) H = -164183.12 (J) S = 32.78 (J/K) V = 4.29 (cc) Cp = 17.49 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.12 | 97.97 | 88.77 | 8.01 | -7.51 | 11.59 | 0.28 |

feldspar mass = 7.36 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.26Al1.26Si2.74O8
G = -122860.35 (J) H = -100872.74 (J) S = 17.27 (J/K) V = 2.84 (cc) Cp = 9.02 (J/K)

albite anorthite sanidine
67.59 25.51 6.90

Total solids mass = 22.43 (gm) density = 3.15 (gm/cc)
G = -328778.67 (J) H = -265055.86 (J) S = 50.05 (J/K) V = 7.13 (cc) Cp = 26.51 (J/K)

Viscosity of the System: 6.68 (log 10 poise)

System mass = 99.96 (gm) density = 2.58 (gm/cc)
G = -1592988.82 (J) H = -1278355.93 (J) S = 247.13 (J/K) V = 38.73 (cc) Cp = 130.78 (J/K)

Oxygen delta moles = -0.00129325 delta grams = -0.0413824
G = 373.23 (J) H = -41.86 (J) S = -0.33 (J/K) V = -136.90 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 990.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.25  COH = 1.96  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 74.87 (gm)  density = 2.45 (gm/cc)  viscosity = 6.40 (log 10 poise)  (analysis in wt %)
G = -1220539.81 (J)  H = -981025.48 (J)  S = 189.62 (J/K)  V = 30.57 (cc)  Cp = 100.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.69 | 1.04 | 18.65 | 0.54 | 0.00 | 2.32 | 0.08 | 0.44 | 0.00 | 0.00 | 1.31 | 2.38 | 5.08 | 0.12 | 1.34 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 15.64 (gm)  density = 3.52 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg0.95Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -212477.56 (J)  H = -169742.28 (J)  S = 33.83 (J/K)  V = 4.44 (cc)  Cp = 18.10 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.14 | 98.09 | 90.55 | 8.16 | -7.65 | 11.70 | 0.27 |

feldspar  mass = 9.45 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -157445.20 (J)  H = -129547.47 (J)  S = 22.09 (J/K)  V = 3.64 (cc)  Cp = 11.57 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.06 | 24.64 | 7.30 |

Total solids  mass = 25.09 (gm)  density = 3.10 (gm/cc)
G = -369922.76 (J)  H = -299289.75 (J)  S = 55.92 (J/K)  V = 8.08 (cc)  Cp = 29.67 (J/K)

Viscosity of the System: 6.87 (log 10 poise)

System  mass = 99.95 (gm)  density = 2.59 (gm/cc)
G = -1590462.57 (J)  H = -1280315.23 (J)  S = 245.53 (J/K)  V = 38.65 (cc)  Cp = 130.25 (J/K)

Oxygen  delta moles = -0.00141021  delta grams = -0.0451249
G = 403.43 (J)  H = -45.14 (J)  S = -0.36 (J/K)  V = -148.10 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 980.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.24  COH = 1.93  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid  mass = 72.41 (gm)  density = 2.45 (gm/cc)  viscosity = 6.52 (log 10 poise)  (analysis in wt %)
G = -1180176.05 (J)  H = -951215.91 (J)  S = 182.71 (J/K)  V = 29.61 (cc)  Cp = 97.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.94 | 1.08 | 18.63 | 0.50 | 0.00 | 2.15 | 0.08 | 0.40 | 0.00 | 0.00 | 1.24 | 2.25 | 5.21 | 0.13 | 1.39 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 16.15 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.92Mg0.94Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -218329.96 (J)  H = -174773.96 (J)  S = 34.76 (J/K)  V = 4.58 (cc)  Cp = 18.65 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.93 98.21 92.14 8.31 -7.79 11.80 0.26

feldspar mass = 11.39 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.08Na0.68Ca0.24Al1.24Si2.76O8
G = -189449.13 (J) H = -156219.31 (J) S = 26.52 (J/K) V = 4.39 (cc) Cp = 13.93 (J/K)
albite anorthite sanidine
68.43 23.88 7.69

Total solids mass = 27.54 (gm) density = 3.07 (gm/cc)
G = -407779.10 (J) H = -330993.27 (J) S = 61.27 (J/K) V = 8.97 (cc) Cp = 32.58 (J/K)

Viscosity of the System: 7.07 (log 10 poise)

System mass = 99.95 (gm) density = 2.59 (gm/cc)
G = -1587955.15 (J) H = -1282209.18 (J) S = 243.98 (J/K) V = 38.57 (cc) Cp = 129.75 (J/K)

Oxygen delta moles = -0.00152157 delta grams = -0.0486885
G = 431.46 (J) H = -48.15 (J) S = -0.38 (J/K) V = -158.53 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 970.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.24 COH = 1.91 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 70.15 (gm) density = 2.44 (gm/cc) viscosity = 6.64 (log 10 poise) (analysis in wt %)
G = -1142947.62 (J) H = -923752.58 (J) S = 176.32 (J/K) V = 28.72 (cc) Cp = 94.03 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.19 1.11 18.61 0.47 0.00 1.98 0.09 0.37 0.00 0.00 1.18 2.11 5.33 0.13 1.43 0.00 0.00 0.00 0.00

orthopyroxene mass = 16.61 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.94Mg0.92Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -223531.44 (J) H = -179319.17 (J) S = 35.56 (J/K) V = 4.70 (cc) Cp = 19.14 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-104.53 98.31 93.54 8.47 -7.93 11.88 0.26

feldspar mass = 13.19 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -218987.19 (J) H = -180970.40 (J) S = 30.58 (J/K) V = 5.08 (cc) Cp = 16.12 (J/K)
albite anorthite sanidine
68.70 23.22 8.08

Total solids mass = 29.80 (gm) density = 3.05 (gm/cc)
G = -442518.63 (J) H = -360289.58 (J) S = 66.15 (J/K) V = 9.78 (cc) Cp = 35.26 (J/K)

Viscosity of the System: 7.26 (log 10 poise)

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1585466.26 (J) H = -1284042.16 (J) S = 242.47 (J/K) V = 38.50 (cc) Cp = 129.29 (J/K)

Oxygen delta moles = -0.00162713 delta grams = -0.0520661
G = 457.30 (J) H = -50.91 (J) S = -0.41 (J/K) V = -168.18 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 960.00 (C) P = 5.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.23 COH = 1.89 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 68.00 (gm) density = 2.44 (gm/cc) viscosity = 6.77 (log 10 poise) (analysis in wt %)
G = -1107796.45 (J) H = -897845.34 (J) S = 170.26 (J/K) V = 27.88 (cc) Cp = 91.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.48 | 1.09 | 18.59 | 0.43 | 0.00 | 1.81 | 0.09 | 0.35 | 0.00 | 0.00 | 1.13 | 1.97 | 5.44 | 0.13 | 1.48 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 16.97 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.95Mg0.91Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -227497.26 (J) H = -182917.67 (J) S = 36.15 (J/K) V = 4.79 (cc) Cp = 19.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.73 | 98.40 | 94.63 | 8.59 | -8.07 | 11.93 | 0.25 |

feldspar mass = 14.89 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -246885.60 (J) H = -204472.06 (J) S = 34.39 (J/K) V = 5.74 (cc) Cp = 18.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.86 | 22.64 | 8.49 |

rhm-oxide mass = 0.08 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.67Mg0.11Fe'"0.22Al0.18Ti0.80O3
G = -825.85 (J) H = -629.16 (J) S = 0.16 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.30 | 10.93 | 67.45 | 1.14 | 9.19 |

Total solids mass = 31.94 (gm) density = 3.03 (gm/cc)
G = -475208.70 (J) H = -388018.89 (J) S = 70.70 (J/K) V = 10.55 (cc) Cp = 37.78 (J/K)

Viscosity of the System: 7.47 (log 10 poise)

System mass = 99.95 (gm) density = 2.60 (gm/cc)
G = -1583005.16 (J) H = -1285864.23 (J) S = 240.96 (J/K) V = 38.44 (cc) Cp = 128.83 (J/K)

Oxygen delta moles = -0.00170903 delta grams = -0.054687
G = 476.03 (J) H = -52.86 (J) S = -0.43 (J/K) V = -175.22 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 950.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.22 COH = 1.87 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 66.01 (gm) density = 2.43 (gm/cc) viscosity = 6.91 (log 10 poise) (analysis in wt %)
G = -1075191.55 (J) H = -873854.43 (J) S = 164.61 (J/K) V = 27.11 (cc) Cp = 88.28 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.79 | 1.05 | 18.58 | 0.39 | 0.00 | 1.64 | 0.09 | 0.32 | 0.00 | 0.00 | 1.08 | 1.84 | 5.55 | 0.14 | 1.52 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.26 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.96Mg0.91Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -230636.09 (J) H = -185883.24 (J) S = 36.59 (J/K) V = 4.87 (cc) Cp = 19.83 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.68 | 98.48 | 95.51 | 8.70 | -8.20 | 11.95 | 0.24 |

feldspar mass = 16.48 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -272781.55 (J) H = -226414.65 (J) S = 37.91 (J/K) V = 6.36 (cc) Cp = 20.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.94 | 22.14 | 8.92 |

rhm-oxide mass = 0.19 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.68Mg0.11Fe'"0.21Al0.18Ti0.80O3
G = -1956.02 (J) H = -1495.23 (J) S = 0.38 (J/K) V = 0.04 (cc) Cp = 0.19 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.18 | 10.58 | 67.95 | 1.20 | 9.09 |

Total solids mass = 33.94 (gm) density = 3.01 (gm/cc)
G = -505373.65 (J) H = -413793.12 (J) S = 74.87 (J/K) V = 11.27 (cc) Cp = 40.12 (J/K)

Viscosity of the System: 7.67 (log 10 poise)

System mass = 99.94 (gm) density = 2.60 (gm/cc)
G = -1580565.20 (J) H = -1287647.56 (J) S = 239.48 (J/K) V = 38.38 (cc) Cp = 128.40 (J/K)

Oxygen delta moles = -0.00177957 delta grams = -0.0569441
G = 491.21 (J) H = -54.41 (J) S = -0.45 (J/K) V = -180.98 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 940.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.21 COH = 1.84 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 64.19 (gm) density = 2.43 (gm/cc) viscosity = 7.04 (log 10 poise) (analysis in wt %)
G = -1045321.96 (J) H = -851926.78 (J) S = 159.42 (J/K) V = 26.40 (cc) Cp = 85.76 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.08 | 1.01 | 18.56 | 0.36 | 0.00 | 1.49 | 0.09 | 0.30 | 0.00 | 0.00 | 1.03 | 1.71 | 5.65 | 0.14 | 1.57 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.52 (gm) density = 3.55 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.01Fe"0.96Mg0.90Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -233342.31 (J) H = -188521.35 (J) S = 36.95 (J/K) V = 4.93 (cc) Cp = 20.09 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.52 | 98.56 | 96.27 | 8.82 | -8.34 | 11.97 | 0.23 |

feldspar mass = 17.94 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -296508.93 (J) H = -246649.46 (J) S = 41.10 (J/K) V = 6.92 (cc) Cp = 21.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.95 | 21.70 | 9.35 |

rhm-oxide mass = 0.29 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.68Mg0.11Fe'"0.20Al0.18Ti0.81O3
G = -2967.76 (J) H = -2276.38 (J) S = 0.57 (J/K) V = 0.06 (cc) Cp = 0.28 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.07 | 10.24 | 68.45 | 1.26 | 8.99 |

Total solids mass = 35.75 (gm) density = 3.00 (gm/cc)
G = -532819.00 (J) H = -437447.19 (J) S = 78.62 (J/K) V = 11.92 (cc) Cp = 42.24 (J/K)

Viscosity of the System: 7.88 (log 10 poise)

System mass = 99.94 (gm) density = 2.61 (gm/cc)
G = -1578140.96 (J) H = -1289373.96 (J) S = 238.03 (J/K) V = 38.32 (cc) Cp = 128.00 (J/K)

Oxygen delta moles = -0.0018482 delta grams = -0.0591403
G = 505.53 (J) H = -55.85 (J) S = -0.46 (J/K) V = -186.42 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 930.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.21 COH = 1.82 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 62.52 (gm) density = 2.43 (gm/cc) viscosity = 7.17 (log 10 poise) (analysis in wt %)
G = -1017901.98 (J) H = -831849.55 (J) S = 154.64 (J/K) V = 25.75 (cc) Cp = 83.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.35 | 0.98 | 18.55 | 0.33 | 0.00 | 1.35 | 0.09 | 0.28 | 0.00 | 0.00 | 0.99 | 1.58 | 5.75 | 0.14 | 1.61 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.75 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.97Mg0.89Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -235671.91 (J) H = -190873.69 (J) S = 37.23 (J/K) V = 4.99 (cc) Cp = 20.32 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.24 | 98.63 | 96.94 | 8.94 | -8.48 | 11.99 | 0.22 |

feldspar mass = 19.29 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -318279.63 (J) H = -265341.38 (J) S = 44.00 (J/K) V = 7.44 (cc) Cp = 23.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.91 | 21.30 | 9.79 |

rhm-oxide mass = 0.38 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.69Mg0.11Fe'''0.20Al0.18Ti0.81O3
G = -3878.70 (J) H = -2985.27 (J) S = 0.74 (J/K) V = 0.08 (cc) Cp = 0.37 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.97 | 9.89 | 68.92 | 1.32 | 8.90 |

Total solids mass = 37.42 (gm) density = 2.99 (gm/cc)
G = -557830.24 (J) H = -459200.34 (J) S = 81.98 (J/K) V = 12.52 (cc) Cp = 44.18 (J/K)

Viscosity of the System: 8.09 (log 10 poise)

System mass = 99.94 (gm) density = 2.61 (gm/cc)
G = -1575732.22 (J) H = -1291049.89 (J) S = 236.61 (J/K) V = 38.26 (cc) Cp = 127.62 (J/K)

Oxygen delta moles = -0.00191474 delta grams = -0.0612694
G = 518.94 (J) H = -57.18 (J) S = -0.48 (J/K) V = -191.54 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 920.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.20 COH = 1.79 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 60.99 (gm) density = 2.43 (gm/cc) viscosity = 7.30 (log 10 poise) (analysis in wt %)
G = -992670.91 (J) H = -813427.69 (J) S = 150.23 (J/K) V = 25.15 (cc) Cp = 81.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.61 | 0.94 | 18.53 | 0.30 | 0.00 | 1.23 | 0.09 | 0.26 | 0.00 | 0.00 | 0.95 | 1.46 | 5.83 | 0.15 | 1.65 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.94 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.98Mg0.89Fe'''0.03Ti0.00Al0.21Si1.88O6
G = -237674.31 (J) H = -192977.12 (J) S = 37.46 (J/K) V = 5.04 (cc) Cp = 20.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.88 | 98.69 | 97.52 | 9.06 | -8.62 | 12.01 | 0.22 |

feldspar mass = 20.54 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -338290.20 (J) H = -282643.93 (J) S = 46.64 (J/K) V = 7.92 (cc) Cp = 24.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.82 | 20.95 | 10.22 |

rhm-oxide mass = 0.46 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.69Mg0.11Fe'''0.19Al0.18Ti0.82O3
G = -4703.31 (J) H = -3632.30 (J) S = 0.90 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.87 | 9.54 | 69.38 | 1.39 | 8.82 |

Total solids mass = 38.94 (gm) density = 2.98 (gm/cc)
G = -580667.82 (J) H = -479253.35 (J) S = 85.00 (J/K) V = 13.07 (cc) Cp = 45.95 (J/K)

Viscosity of the System: 8.30 (log 10 poise)

System mass = 99.94 (gm) density = 2.62 (gm/cc)
G = -1573338.73 (J) H = -1292681.04 (J) S = 235.22 (J/K) V = 38.21 (cc) Cp = 127.27 (J/K)

Oxygen delta moles = -0.00197906 delta grams = -0.0633275
G = 531.42 (J) H = -58.39 (J) S = -0.49 (J/K) V = -196.33 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 910.00 (C) P = 5.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.19 COH = 1.77 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 59.59 (gm) density = 2.42 (gm/cc) viscosity = 7.43 (log 10 poise) (analysis in wt %)
G = -969391.86 (J) H = -796483.11 (J) S = 146.14 (J/K) V = 24.59 (cc) Cp = 79.36 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.85 | 0.90 | 18.52 | 0.27 | 0.00 | 1.11 | 0.09 | 0.25 | 0.00 | 0.00 | 0.91 | 1.35 | 5.90 | 0.15 | 1.69 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.12 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.98Mg0.88Fe'"0.03Ti0.00Al0.21Si1.88O6
G = -239392.84 (J) H = -194864.02 (J) S = 37.64 (J/K) V = 5.09 (cc) Cp = 20.70 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.44 | 98.75 | 98.03 | 9.19 | -8.76 | 12.03 | 0.21 |

feldspar mass = 21.69 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.11Na0.69Ca0.21Al1.21Si2.79O8
G = -356722.07 (J) H = -298699.29 (J) S = 49.04 (J/K) V = 8.37 (cc) Cp = 26.35 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.69 | 20.64 | 10.67 |

rhm-oxide mass = 0.54 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.70Mg0.11Fe'"0.18Al0.17Ti0.82O3
G = -5453.51 (J) H = -4226.02 (J) S = 1.04 (J/K) V = 0.12 (cc) Cp = 0.52 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.79 | 9.20 | 69.83 | 1.45 | 8.73 |

Total solids mass = 40.35 (gm) density = 2.97 (gm/cc)
G = -601568.43 (J) H = -497789.33 (J) S = 87.71 (J/K) V = 13.57 (cc) Cp = 47.57 (J/K)

Viscosity of the System: 8.51 (log 10 poise)

System mass = 99.93 (gm) density = 2.62 (gm/cc)
G = -1570960.29 (J) H = -1294272.44 (J) S = 233.86 (J/K) V = 38.17 (cc) Cp = 126.94 (J/K)

Oxygen delta moles = -0.0020411 delta grams = -0.0653128
G = 542.99 (J) H = -59.50 (J) S = -0.51 (J/K) V = -200.78 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 900.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = 0.19  COH = 1.74  IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid  mass = 58.00 (gm)  density = 2.42 (gm/cc)  viscosity = 7.54 (log 10 poise)  (analysis in wt %)
G = -943024.87 (J)  H = -776819.37 (J)  S = 141.67 (J/K)  V = 23.96 (cc)  Cp = 77.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.99 | 0.87 | 18.56 | 0.25 | 0.00 | 1.00 | 0.10 | 0.23 | 0.00 | 0.00 | 0.88 | 1.24 | 5.99 | 0.16 | 1.74 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 18.27 (gm)  density = 3.56 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.98Mg0.88Fe"'0.03Ti0.00Al0.22Si1.87O6
G = -240933.01 (J)  H = -196621.03 (J)  S = 37.77 (J/K)  V = 5.13 (cc)  Cp = 20.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.95 | 98.81 | 98.42 | 9.36 | -8.95 | 12.11 | 0.20 |

feldspar  mass = 22.83 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)
K0.11Na0.68Ca0.20Al1.20Si2.80O8
G = -374791.85 (J)  H = -314518.72 (J)  S = 51.38 (J/K)  V = 8.81 (cc)  Cp = 27.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.44 | 20.36 | 11.19 |

quartz  mass = 0.22 (gm)  density = 2.55 (gm/cc)
SiO2
G = -3634.70 (J)  H = -3086.98 (J)  S = 0.47 (J/K)  V = 0.09 (cc)  Cp = 0.26 (J/K)

rhm-oxide  mass = 0.61 (gm)  density = 4.59 (gm/cc)  (analysis in mole %)
Mn0.02Fe"0.70Mg0.11Fe"'0.18Al0.17Ti0.82O3
G = -6214.25 (J)  H = -4831.92 (J)  S = 1.18 (J/K)  V = 0.13 (cc)  Cp = 0.59 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.71 | 8.88 | 70.20 | 1.52 | 8.69 |

Total solids  mass = 41.94 (gm)  density = 2.96 (gm/cc)
G = -625573.82 (J)  H = -519058.66 (J)  S = 90.79 (J/K)  V = 14.16 (cc)  Cp = 49.41 (J/K)

Viscosity of the System: 8.72 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.62 (gm/cc)
G = -1568598.69 (J)  H = -1295878.03 (J)  S = 232.47 (J/K)  V = 38.11 (cc)  Cp = 126.60 (J/K)

Oxygen  delta moles = -0.00209716  delta grams = -0.0671066
G = 552.67 (J)  H = -60.39 (J)  S = -0.52 (J/K)  V = -204.56 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 890.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -12.07  delta HM = -5.05  NNO = 0.00  QFM = 0.18  COH = 1.72  IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 55.62 (gm) density = 2.42 (gm/cc) viscosity = 7.60 (log 10 poise) (analysis in wt %)
G = -903846.10 (J) H = -746272.03 (J) S = 135.47 (J/K) V = 22.99 (cc) Cp = 74.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.82 | 0.83 | 18.79 | 0.23 | 0.00 | 0.91 | 0.10 | 0.22 | 0.00 | 0.00 | 0.85 | 1.14 | 6.14 | 0.16 | 1.81 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.42 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.99Mg0.87Fe'"0.03Ti0.00Al0.22Si1.87O6
G = -242470.11 (J) H = -198397.01 (J) S = 37.89 (J/K) V = 5.16 (cc) Cp = 21.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.46 | 98.88 | 98.61 | 9.70 | -9.30 | 12.38 | 0.19 |

feldspar mass = 24.08 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.12Na0.68Ca0.20Al1.20Si2.80O8
G = -394677.36 (J) H = -331928.69 (J) S = 53.95 (J/K) V = 9.29 (cc) Cp = 29.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.92 | 20.12 | 11.95 |

quartz mass = 1.10 (gm) density = 2.55 (gm/cc)
SiO2
G = -18135.82 (J) H = -15435.62 (J) S = 2.32 (J/K) V = 0.43 (cc) Cp = 1.29 (J/K)

rhm-oxide mass = 0.70 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.11Fe'"0.17Al0.18Ti0.83O3
G = -7129.49 (J) H = -5562.64 (J) S = 1.35 (J/K) V = 0.15 (cc) Cp = 0.68 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.65 | 8.64 | 70.36 | 1.59 | 8.77 |

Total solids mass = 44.31 (gm) density = 2.95 (gm/cc)
G = -662412.78 (J) H = -551323.95 (J) S = 95.51 (J/K) V = 15.04 (cc) Cp = 52.18 (J/K)

Viscosity of the System: 8.96 (log 10 poise)

System mass = 99.93 (gm) density = 2.63 (gm/cc)
G = -1566258.87 (J) H = -1297595.98 (J) S = 230.98 (J/K) V = 38.03 (cc) Cp = 126.23 (J/K)

Oxygen delta moles = -0.00213968 delta grams = -0.0684672
G = 558.55 (J) H = -60.85 (J) S = -0.53 (J/K) V = -206.92 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 880.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.17 COH = 1.69 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 53.41 (gm) density = 2.42 (gm/cc) viscosity = 7.65 (log 10 poise) (analysis in wt %)
G = -867245.24 (J) H = -717697.91 (J) S = 129.69 (J/K) V = 22.09 (cc) Cp = 71.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.63 | 0.79 | 19.02 | 0.21 | 0.00 | 0.83 | 0.10 | 0.21 | 0.00 | 0.00 | 0.82 | 1.05 | 6.28 | 0.17 | 1.88 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.55 (gm) density = 3.57 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.99Mg0.87Fe'"0.03Ti0.00Al0.23Si1.87O6
G = -243822.96 (J) H = -200033.12 (J) S = 37.97 (J/K) V = 5.20 (cc) Cp = 21.14 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -110.92 | 98.94 | 98.74 | 10.06 | -9.67 | 12.66 | 0.19 |

feldspar mass = 25.26 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.13Na0.67Ca0.20Al1.20Si2.80O8
G = -413185.09 (J) H = -348249.52 (J) S = 56.31 (J/K) V = 9.75 (cc) Cp = 30.59 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.34 | 19.88 | 12.78 |

quartz mass = 1.93 (gm) density = 2.55 (gm/cc)
SiO2
G = -31722.82 (J) H = -27056.84 (J) S = 4.05 (J/K) V = 0.76 (cc) Cp = 2.26 (J/K)

rhm-oxide mass = 0.79 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.11Fe'"0.17Al0.18Ti0.83O3
G = -7958.49 (J) H = -6230.83 (J) S = 1.50 (J/K) V = 0.17 (cc) Cp = 0.76 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.60 | 8.40 | 70.50 | 1.66 | 8.85 |

Total solids mass = 46.53 (gm) density = 2.93 (gm/cc)
G = -696689.38 (J) H = -581570.31 (J) S = 99.83 (J/K) V = 15.87 (cc) Cp = 54.75 (J/K)

Viscosity of the System: 9.23 (log 10 poise)

System mass = 99.93 (gm) density = 2.63 (gm/cc)
G = -1563934.62 (J) H = -1299268.23 (J) S = 229.52 (J/K) V = 37.96 (cc) Cp = 125.87 (J/K)

Oxygen delta moles = -0.00218076 delta grams = -0.0697817
G = 563.85 (J) H = -61.24 (J) S = -0.54 (J/K) V = -209.08 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 870.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.16 COH = 1.66 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 49.90 (gm) density = 2.41 (gm/cc) viscosity = 7.65 (log 10 poise) (analysis in wt %)
G = -809808.17 (J) H = -671430.03 (J) S = 121.05 (J/K) V = 20.67 (cc) Cp = 66.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.59 | 0.76 | 18.99 | 0.19 | 0.00 | 0.74 | 0.11 | 0.20 | 0.00 | 0.00 | 0.81 | 1.02 | 6.39 | 0.18 | 2.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 2.49 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.61Mg0.33)3Al2Si3O12
G = -33811.99 (J) H = -28159.55 (J) S = 4.94 (J/K) V = 0.63 (cc) Cp = 2.72 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 61.16 | 5.77 | 33.07 |

orthopyroxene mass = 16.72 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.97Mg0.89Fe"'0.03Ti0.00Al0.22Si1.87O6
G = -220352.63 (J) H = -181381.20 (J) S = 34.09 (J/K) V = 4.69 (cc) Cp = 19.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.84 | 98.93 | 97.10 | 9.87 | -9.49 | 12.24 | 0.19 |

feldspar mass = 25.39 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.14Na0.67Ca0.19Al1.19Si2.81O8
G = -414507.63 (J) H = -350107.79 (J) S = 56.34 (J/K) V = 9.80 (cc) Cp = 30.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.96 | 19.30 | 13.74 |

feldspar mass = 1.23 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.57Na0.39Ca0.03Al1.03Si2.97O8
G = -19595.12 (J) H = -16515.51 (J) S = 2.69 (J/K) V = 0.48 (cc) Cp = 1.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 39.26 | 3.47 | 57.27 |

quartz mass = 3.32 (gm) density = 2.55 (gm/cc)
SiO2
G = -54570.71 (J) H = -46642.39 (J) S = 6.94 (J/K) V = 1.30 (cc) Cp = 3.89 (J/K)

rhm-oxide mass = 0.88 (gm) density = 4.59 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.11Fe"'0.16Al0.17Ti0.83O3
G = -8928.28 (J) H = -7015.50 (J) S = 1.67 (J/K) V = 0.19 (cc) Cp = 0.85 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.91 | 8.03 | 70.58 | 1.78 | 8.69 |

Total solids mass = 50.03 (gm) density = 2.93 (gm/cc)
G = -751766.36 (J) H = -629821.94 (J) S = 106.67 (J/K) V = 17.10 (cc) Cp = 58.72 (J/K)

Viscosity of the System: 9.70 (log 10 poise)

System mass = 99.93 (gm) density = 2.65 (gm/cc)
G = -1561574.54 (J) H = -1301251.96 (J) S = 227.72 (J/K) V = 37.78 (cc) Cp = 125.19 (J/K)

Oxygen delta moles = -0.00231914 delta grams = -0.0742097
G = 593.87 (J) H = -64.31 (J) S = -0.58 (J/K) V = -220.42 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 860.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.64 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 45.18 (gm) density = 2.41 (gm/cc) viscosity = 7.58 (log 10 poise) (analysis in wt %)
G = -733349.18 (J) H = -608934.10 (J) S = 109.80 (J/K) V = 18.77 (cc) Cp = 60.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.59 | 0.72 | 18.89 | 0.18 | 0.00 | 0.66 | 0.11 | 0.21 | 0.00 | 0.00 | 0.83 | 1.05 | 6.34 | 0.20 | 2.23 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 5.94 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.60Mg0.34)3Al2Si3O12
G = -80754.42 (J) H = -67445.90 (J) S = 11.74 (J/K) V = 1.51 (cc) Cp = 6.50 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.26 | 5.83 | 33.91 |

orthopyroxene mass = 14.12 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.94Mg0.93Fe'"0.02Ti0.00Al0.21Si1.88O6
G = -187089.63 (J) H = -154576.28 (J) S = 28.69 (J/K) V = 3.98 (cc) Cp = 16.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -105.32 | 98.89 | 94.33 | 9.47 | -9.09 | 11.53 | 0.19 |

feldspar mass = 23.53 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.13Na0.67Ca0.20Al1.20Si2.80O8
G = -383718.70 (J) H = -324844.98 (J) S = 51.96 (J/K) V = 9.08 (cc) Cp = 28.45 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.36 | 19.53 | 13.12 |

feldspar mass = 5.11 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.58Na0.38Ca0.03Al1.03Si2.97O8
G = -81281.30 (J) H = -68662.02 (J) S = 11.14 (J/K) V = 2.02 (cc) Cp = 6.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.38 | 3.23 | 58.39 |

quartz mass = 5.05 (gm) density = 2.55 (gm/cc)
SiO2
G = -82950.63 (J) H = -71048.35 (J) S = 10.50 (J/K) V = 1.98 (cc) Cp = 5.92 (J/K)

rhm-oxide mass = 1.00 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.71Mg0.11Fe'"0.15Al0.17Ti0.84O3
G = -10080.17 (J) H = -7951.03 (J) S = 1.88 (J/K) V = 0.22 (cc) Cp = 0.95 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.45 | 7.59 | 70.55 | 1.93 | 8.48 |

Total solids mass = 54.74 (gm) density = 2.92 (gm/cc)
G = -825874.85 (J) H = -694528.56 (J) S = 115.91 (J/K) V = 18.77 (cc) Cp = 64.04 (J/K)

Viscosity of the System: 16.07 (log 10 poise)

System mass = 99.92 (gm) density = 2.66 (gm/cc)
G = -1559224.03 (J) H = -1303462.66 (J) S = 225.71 (J/K) V = 37.54 (cc) Cp = 124.30 (J/K)

Oxygen delta moles = -0.00247709 delta grams = -0.0792638
G = 628.17 (J) H = -67.81 (J) S = -0.61 (J/K) V = -233.37 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 850.00 (C) P = 5.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.15 COH = 1.61 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 41.12 (gm) density = 2.40 (gm/cc) viscosity = 7.51 (log 10 poise) (analysis in wt %)
G = -667346.86 (J) H = -554926.26 (J) S = 100.09 (J/K) V = 17.13 (cc) Cp = 54.90 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.57 | 0.68 | 18.78 | 0.16 | 0.00 | 0.60 | 0.12 | 0.21 | 0.00 | 0.00 | 0.85 | 1.08 | 6.29 | 0.22 | 2.45 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.83 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.59Mg0.35)3Al2Si3O12
G = -120235.58 (J) H = -100702.27 (J) S = 17.39 (J/K) V = 2.24 (cc) Cp = 9.67 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.40 | 5.88 | 34.71 |

orthopyroxene mass = 11.94 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.92Mg0.96Fe'"0.02Ti0.00Al0.20Si1.89O6
G = -159107.55 (J) H = -131937.82 (J) S = 24.19 (J/K) V = 3.37 (cc) Cp = 13.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.92 | 98.85 | 91.62 | 9.08 | -8.70 | 10.87 | 0.20 |

feldspar mass = 22.09 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.13Na0.68Ca0.20Al1.20Si2.80O8
G = -360002.51 (J) H = -305461.70 (J) S = 48.56 (J/K) V = 8.52 (cc) Cp = 26.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.75 | 19.70 | 12.54 |

feldspar mass = 8.29 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.59Na0.38Ca0.03Al1.03Si2.97O8
G = -131645.50 (J) H = -111458.25 (J) S = 17.97 (J/K) V = 3.27 (cc) Cp = 9.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.54 | 3.01 | 59.45 |

quartz mass = 6.55 (gm) density = 2.55 (gm/cc)
SiO2
G = -107540.74 (J) H = -92303.43 (J) S = 13.57 (J/K) V = 2.57 (cc) Cp = 7.68 (J/K)

rhm-oxide mass = 1.09 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.14Al0.17Ti0.85O3
G = -11032.52 (J) H = -8735.03 (J) S = 2.05 (J/K) V = 0.24 (cc) Cp = 1.04 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.98 | 7.19 | 70.48 | 2.07 | 8.28 |

Total solids mass = 58.80 (gm) density = 2.91 (gm/cc)
G = -889564.41 (J) H = -750598.50 (J) S = 123.73 (J/K) V = 20.21 (cc) Cp = 68.62 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.68 (gm/cc)
G = -1556911.26 (J) H = -1305524.76 (J) S = 223.82 (J/K) V = 37.34 (cc) Cp = 123.52 (J/K)

Oxygen delta moles = -0.00260065 delta grams = -0.0832175
G = 653.05 (J) H = -70.27 (J) S = -0.64 (J/K) V = -242.85 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 840.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -13.04  delta HM = -5.09  NNO = 0.00  QFM = 0.14  COH = 1.58  IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid  mass = 37.56 (gm)  density = 2.39 (gm/cc)  viscosity = 7.43 (log 10 poise)  (analysis in wt %)
G = -609656.94 (J)  H = -507662.31 (J)  S = 91.63 (J/K)  V = 15.69 (cc)  Cp = 50.22 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.53 | 0.64 | 18.68 | 0.15 | 0.00 | 0.54 | 0.13 | 0.22 | 0.00 | 0.00 | 0.87 | 1.11 | 6.22 | 0.24 | 2.68 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 11.29 (gm)  density = 3.94 (gm/cc)  (analysis in mole %)
(Ca0.06Fe"0.59Mg0.35)3Al2Si3O12
G = -153850.56 (J)  H = -129213.07 (J)  S = 22.13 (J/K)  V = 2.87 (cc)  Cp = 12.36 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.59 | 5.93 | 35.48 |

orthopyroxene  mass = 10.10 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.89Mg0.99Fe'"0.02Ti0.00Al0.19Si1.89O6
G = -135275.90 (J)  H = -112578.02 (J)  S = 20.39 (J/K)  V = 2.86 (cc)  Cp = 11.61 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.62 | 98.82 | 88.98 | 8.70 | -8.33 | 10.25 | 0.20 |

feldspar  mass = 20.98 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)
K0.12Na0.68Ca0.20Al1.20Si2.80O8
G = -341510.09 (J)  H = -290427.30 (J)  S = 45.89 (J/K)  V = 8.09 (cc)  Cp = 25.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.16 | 19.84 | 12.01 |

feldspar  mass = 10.94 (gm)  density = 2.53 (gm/cc)  (analysis in mole %)
K0.60Na0.37Ca0.03Al1.03Si2.97O8
G = -173392.22 (J)  H = -147134.43 (J)  S = 23.59 (J/K)  V = 4.32 (cc)  Cp = 12.97 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.74 | 2.80 | 60.46 |

quartz  mass = 7.88 (gm)  density = 2.55 (gm/cc)
SiO2
G = -129118.44 (J)  H = -111055.69 (J)  S = 16.23 (J/K)  V = 3.09 (cc)  Cp = 9.22 (J/K)

rhm-oxide  mass = 1.17 (gm)  density = 4.58 (gm/cc)  (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.14Al0.16Ti0.85O3
G = -11826.17 (J)  H = -9398.10 (J)  S = 2.18 (J/K)  V = 0.26 (cc)  Cp = 1.11 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.49 | 6.81 | 70.40 | 2.20 | 8.09 |

Total solids  mass = 62.35 (gm)  density = 2.90 (gm/cc)
G = -944973.38 (J)  H = -799806.61 (J)  S = 130.41 (J/K)  V = 21.48 (cc)  Cp = 72.61 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.91 (gm)  density = 2.69 (gm/cc)
G = -1554630.31 (J)  H = -1307468.92 (J)  S = 222.04 (J/K)  V = 37.17 (cc)  Cp = 122.84 (J/K)

Oxygen delta moles = -0.00269878 delta grams = -0.0863576
G = 671.02 (J) H = -71.97 (J) S = -0.67 (J/K) V = -249.77 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 830.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.13 COH = 1.55 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 34.42 (gm) density = 2.39 (gm/cc) viscosity = 7.34 (log 10 poise) (analysis in wt %)
G = -558676.38 (J) H = -465838.03 (J) S = 84.16 (J/K) V = 14.42 (cc) Cp = 46.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.46 | 0.60 | 18.59 | 0.14 | 0.00 | 0.49 | 0.13 | 0.22 | 0.00 | 0.00 | 0.88 | 1.15 | 6.16 | 0.26 | 2.92 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 13.39 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.58Mg0.36)3Al2Si3O12
G = -182780.38 (J) H = -153930.07 (J) S = 26.15 (J/K) V = 3.41 (cc) Cp = 14.66 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.82 | 5.97 | 36.20 |

orthopyroxene mass = 8.52 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.86Mg1.02Fe'"0.02Ti0.00Al0.18Si1.90O6
G = -114757.59 (J) H = -95838.72 (J) S = 17.15 (J/K) V = 2.42 (cc) Cp = 9.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -95.43 | 98.79 | 86.39 | 8.34 | -7.97 | 9.68 | 0.21 |

feldspar mass = 20.11 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.69Ca0.20Al1.20Si2.80O8
G = -326965.95 (J) H = -278685.34 (J) S = 43.77 (J/K) V = 7.75 (cc) Cp = 24.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.56 | 19.94 | 11.51 |

feldspar mass = 13.17 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.03Al1.03Si2.97O8
G = -208438.14 (J) H = -177271.35 (J) S = 28.25 (J/K) V = 5.20 (cc) Cp = 15.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.96 | 2.61 | 61.43 |

quartz mass = 9.06 (gm) density = 2.55 (gm/cc)
SiO2
G = -148266.86 (J) H = -127791.39 (J) S = 18.56 (J/K) V = 3.55 (cc) Cp = 10.59 (J/K)

rhm-oxide mass = 1.23 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.13Fe'"0.13Al0.16Ti0.86O3
G = -12491.62 (J) H = -9963.14 (J) S = 2.29 (J/K) V = 0.27 (cc) Cp = 1.17 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.00 | 6.46 | 70.30 | 2.33 | 7.90 |

Total solids mass = 65.49 (gm) density = 2.90 (gm/cc)

G = -993700.54 (J)  H = -843480.01 (J)  S = 136.17 (J/K)  V = 22.60 (cc)  Cp = 76.14 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.91 (gm)  density = 2.70 (gm/cc)
G = -1552376.91 (J)  H = -1309318.05 (J)  S = 220.33 (J/K)  V = 37.01 (cc)  Cp = 122.23 (J/K)

Oxygen  delta moles = -0.00277782  delta grams = -0.0888868
G = 683.80 (J)  H = -73.10 (J)  S = -0.69 (J/K)  V = -254.78 (cc)  Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 820.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = 0.12  COH = 1.52  IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 31.62 (gm)  density = 2.38 (gm/cc)  viscosity = 7.24 (log 10 poise)  (analysis in wt %)
G = -513178.94 (J)  H = -428455.42 (J)  S = 77.50 (J/K)  V = 13.28 (cc)  Cp = 42.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.36 | 0.56 | 18.51 | 0.12 | 0.00 | 0.44 | 0.14 | 0.22 | 0.00 | 0.00 | 0.90 | 1.19 | 6.08 | 0.29 | 3.18 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 15.22 (gm)  density = 3.93 (gm/cc)  (analysis in mole %)
(Ca0.06Fe"0.57Mg0.37)3Al2Si3O12
G = -207918.90 (J)  H = -175574.26 (J)  S = 29.59 (J/K)  V = 3.87 (cc)  Cp = 16.66 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.09 | 6.01 | 36.90 |

orthopyroxene  mass = 7.16 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.84Mg1.05Fe'"0.02Ti0.00Al0.17Si1.90O6
G = -96918.89 (J)  H = -81221.02 (J)  S = 14.36 (J/K)  V = 2.04 (cc)  Cp = 8.26 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.33 | 98.76 | 83.84 | 7.99 | -7.62 | 9.14 | 0.21 |

feldspar  mass = 19.42 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.11Na0.69Ca0.20Al1.20Si2.80O8
G = -315463.72 (J)  H = -269484.70 (J)  S = 42.06 (J/K)  V = 7.48 (cc)  Cp = 23.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.96 | 20.00 | 11.03 |

feldspar  mass = 15.08 (gm)  density = 2.53 (gm/cc)  (analysis in mole %)
K0.62Na0.35Ca0.02Al1.02Si2.98O8
G = -238181.40 (J)  H = -203022.39 (J)  S = 32.16 (J/K)  V = 5.95 (cc)  Cp = 17.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.20 | 2.43 | 62.38 |

quartz  mass = 10.12 (gm)  density = 2.55 (gm/cc)
SiO2
G = -165433.93 (J)  H = -142884.21 (J)  S = 20.63 (J/K)  V = 3.97 (cc)  Cp = 11.82 (J/K)

rhm-oxide  mass = 1.29 (gm)  density = 4.57 (gm/cc)  (analysis in mole %)

Mn0.02Fe"0.70Mg0.13Fe'"0.12Al0.15Ti0.86O3
G = -13052.16 (J) H = -10447.67 (J) S = 2.38 (J/K) V = 0.28 (cc) Cp = 1.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.49 | 6.14 | 70.19 | 2.45 | 7.73 |

Total solids mass = 68.29 (gm) density = 2.89 (gm/cc)
G = -1036969.00 (J) H = -882634.27 (J) S = 141.18 (J/K) V = 23.60 (cc) Cp = 79.28 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.71 (gm/cc)
G = -1550147.94 (J) H = -1311089.69 (J) S = 218.69 (J/K) V = 36.88 (cc) Cp = 121.68 (J/K)

Oxygen delta moles = -0.00284233 delta grams = -0.0909511
G = 692.67 (J) H = -73.80 (J) S = -0.70 (J/K) V = -258.33 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 810.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.11 COH = 1.49 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 29.09 (gm) density = 2.37 (gm/cc) viscosity = 7.12 (log 10 poise) (analysis in wt %)
G = -472206.62 (J) H = -394734.29 (J) S = 71.53 (J/K) V = 12.25 (cc) Cp = 39.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.24 | 0.52 | 18.43 | 0.11 | 0.00 | 0.40 | 0.15 | 0.22 | 0.00 | 0.00 | 0.93 | 1.24 | 6.00 | 0.31 | 3.46 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 16.81 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.56Mg0.38)3Al2Si3O12
G = -229956.10 (J) H = -194702.84 (J) S = 32.55 (J/K) V = 4.29 (cc) Cp = 18.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.38 | 6.05 | 37.57 |

orthopyroxene mass = 5.98 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.81Mg1.08Fe'"0.01Ti0.00Al0.17Si1.91O6
G = -81270.41 (J) H = -68339.04 (J) S = 11.94 (J/K) V = 1.71 (cc) Cp = 6.91 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.30 | 98.73 | 81.34 | 7.66 | -7.29 | 8.64 | 0.22 |

feldspar mass = 18.88 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.69Ca0.20Al1.20Si2.80O8
G = -306342.98 (J) H = -262277.78 (J) S = 40.68 (J/K) V = 7.27 (cc) Cp = 22.82 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.37 | 20.05 | 10.58 |

feldspar mass = 16.72 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.63Na0.34Ca0.02Al1.02Si2.98O8
G = -263667.59 (J) H = -225250.40 (J) S = 35.47 (J/K) V = 6.60 (cc) Cp = 19.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.45 | 2.26 | 63.29 |

quartz mass = 11.09 (gm) density = 2.55 (gm/cc)
SiO2
G = -180971.45 (J) H = -156627.86 (J) S = 22.47 (J/K) V = 4.35 (cc) Cp = 12.93 (J/K)

rhm-oxide mass = 1.33 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.14Fe'"0.12Al0.15Ti0.87O3
G = -13525.93 (J) H = -10865.34 (J) S = 2.46 (J/K) V = 0.29 (cc) Cp = 1.26 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.98 | 5.83 | 70.07 | 2.56 | 7.56 |

Total solids mass = 70.82 (gm) density = 2.89 (gm/cc)
G = -1075734.46 (J) H = -918063.25 (J) S = 145.57 (J/K) V = 24.50 (cc) Cp = 82.11 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1547941.08 (J) H = -1312797.55 (J) S = 217.09 (J/K) V = 36.75 (cc) Cp = 121.20 (J/K)

Oxygen delta moles = -0.00289566 delta grams = -0.0926577
G = 698.53 (J) H = -74.16 (J) S = -0.71 (J/K) V = -260.77 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 800.00 (C) P = 5.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.10 COH = 1.46 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 26.80 (gm) density = 2.37 (gm/cc) viscosity = 7.00 (log 10 poise) (analysis in wt %)
G = -434995.57 (J) H = -364051.98 (J) S = 66.11 (J/K) V = 11.32 (cc) Cp = 36.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.08 | 0.48 | 18.35 | 0.11 | 0.00 | 0.36 | 0.16 | 0.22 | 0.00 | 0.00 | 0.95 | 1.29 | 5.91 | 0.34 | 3.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 18.22 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.56Mg0.38)3Al2Si3O12
G = -249434.43 (J) H = -211754.48 (J) S = 35.11 (J/K) V = 4.65 (cc) Cp = 19.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.71 | 6.07 | 38.22 |

orthopyroxene mass = 4.94 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.79Mg1.11Fe'"0.01Ti0.00Al0.16Si1.91O6
G = -67427.17 (J) H = -56888.64 (J) S = 9.82 (J/K) V = 1.42 (cc) Cp = 5.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.35 | 98.71 | 78.88 | 7.34 | -6.97 | 8.17 | 0.22 |

feldspar mass = 18.46 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -299112.06 (J) H = -256656.55 (J) S = 39.56 (J/K) V = 7.10 (cc) Cp = 22.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.78 | 20.07 | 10.15 |

feldspar mass = 18.15 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -285696.17 (J) H = -244615.48 (J) S = 38.28 (J/K) V = 7.16 (cc) Cp = 21.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.72 | 2.10 | 64.18 |

quartz mass = 11.97 (gm) density = 2.55 (gm/cc)
SiO2
G = -195161.92 (J) H = -169258.47 (J) S = 24.14 (J/K) V = 4.69 (cc) Cp = 13.94 (J/K)

rhm-oxide mass = 1.37 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.14Fe'"0.11Al0.15Ti0.87O3
G = -13927.25 (J) H = -11226.96 (J) S = 2.52 (J/K) V = 0.30 (cc) Cp = 1.29 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.46 | 5.54 | 69.93 | 2.67 | 7.40 |

Total solids mass = 73.11 (gm) density = 2.89 (gm/cc)
G = -1110758.98 (J) H = -950400.58 (J) S = 149.43 (J/K) V = 25.32 (cc) Cp = 84.68 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.73 (gm/cc)
G = -1545754.56 (J) H = -1314452.55 (J) S = 215.54 (J/K) V = 36.64 (cc) Cp = 120.76 (J/K)

Oxygen delta moles = -0.0029403 delta grams = -0.094086
G = 702.06 (J) H = -74.27 (J) S = -0.72 (J/K) V = -262.35 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 790.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = 0.09 COH = 1.43 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 24.70 (gm) density = 2.36 (gm/cc) viscosity = 6.86 (log 10 poise) (analysis in wt %)
G = -400923.98 (J) H = -335900.83 (J) S = 61.16 (J/K) V = 10.46 (cc) Cp = 33.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.88 | 0.44 | 18.29 | 0.10 | 0.00 | 0.33 | 0.17 | 0.22 | 0.00 | 0.00 | 0.98 | 1.34 | 5.81 | 0.37 | 4.07 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.47 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.55Mg0.39)3Al2Si3O12
G = -266788.08 (J) H = -227080.96 (J) S = 37.35 (J/K) V = 4.97 (cc) Cp = 21.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.06 | 6.10 | 38.84 |

orthopyroxene mass = 4.01 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.76Mg1.14Fe'"0.01Ti0.00Al0.15Si1.92O6
G = -55080.83 (J) H = -46625.63 (J) S = 7.95 (J/K) V = 1.15 (cc) Cp = 4.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.46 | 98.68 | 76.44 | 7.04 | -6.66 | 7.74 | 0.22 |

feldspar mass = 18.12 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -293397.83 (J) H = -252311.22 (J) S = 38.65 (J/K) V = 6.97 (cc) Cp = 21.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.19 | 20.07 | 9.74 |

feldspar mass = 19.41 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -304891.18 (J) H = -261633.28 (J) S = 40.69 (J/K) V = 7.66 (cc) Cp = 22.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.00 | 1.95 | 65.06 |

quartz mass = 12.79 (gm) density = 2.55 (gm/cc)
SiO2
G = -208237.50 (J) H = -180970.47 (J) S = 25.65 (J/K) V = 5.01 (cc) Cp = 14.88 (J/K)

rhm-oxide mass = 1.40 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.15Fe'"0.11Al0.14Ti0.87O3
G = -14267.65 (J) H = -11541.26 (J) S = 2.56 (J/K) V = 0.31 (cc) Cp = 1.32 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.93 | 5.27 | 69.79 | 2.76 | 7.24 |

Total solids mass = 75.21 (gm) density = 2.88 (gm/cc)
G = -1142663.07 (J) H = -980162.82 (J) S = 152.85 (J/K) V = 26.08 (cc) Cp = 87.04 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.73 (gm/cc)
G = -1543587.05 (J) H = -1316063.64 (J) S = 214.01 (J/K) V = 36.54 (cc) Cp = 120.36 (J/K)

Oxygen delta moles = -0.00297811 delta grams = -0.0952959
G = 703.76 (J) H = -74.18 (J) S = -0.73 (J/K) V = -263.25 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 780.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = 0.08 COH = 1.40 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 20.38 (gm) density = 2.35 (gm/cc) viscosity = 6.65 (log 10 poise) (analysis in wt %)
G = -330740.59 (J) H = -277279.62 (J) S = 50.76 (J/K) V = 8.66 (cc) Cp = 27.57 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.61 | 0.39 | 18.09 | 0.10 | 0.00 | 0.33 | 0.19 | 0.20 | 0.00 | 0.00 | 1.05 | 1.47 | 5.66 | 0.44 | 4.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.56 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.57Mg0.37)3Al2Si3O12
G = -306789.04 (J) H = -261557.38 (J) S = 42.95 (J/K) V = 5.74 (cc) Cp = 24.59 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.73 | 6.19 | 37.09 |

biotite mass = 2.22 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -35578.79 (J) H = -30476.64 (J) S = 4.84 (J/K) V = 0.81 (cc) Cp = 2.80 (J/K)

| annite | phlogopite |
|---|---|
| 1.66 | 98.34 |

feldspar mass = 18.17 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -293806.69 (J) H = -253195.85 (J) S = 38.56 (J/K) V = 6.99 (cc) Cp = 22.04 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.16 | 19.19 | 9.65 |

feldspar mass = 19.66 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -308498.91 (J) H = -265312.99 (J) S = 41.01 (J/K) V = 7.76 (cc) Cp = 23.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.95 | 1.79 | 65.25 |

quartz mass = 15.44 (gm) density = 2.55 (gm/cc)
SiO2
G = -251160.42 (J) H = -218721.00 (J) S = 30.80 (J/K) V = 6.05 (cc) Cp = 17.95 (J/K)

rhm-oxide mass = 1.47 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.14Fe'"0.11Al0.14Ti0.88O3
G = -14861.87 (J) H = -12045.48 (J) S = 2.67 (J/K) V = 0.32 (cc) Cp = 1.38 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.03 | 5.33 | 70.75 | 2.90 | 6.99 |

Total solids mass = 79.53 (gm) density = 2.87 (gm/cc)
G = -1210695.73 (J) H = -1041309.33 (J) S = 160.84 (J/K) V = 27.67 (cc) Cp = 92.00 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.75 (gm/cc)
G = -1541436.32 (J) H = -1318588.95 (J) S = 211.60 (J/K) V = 36.34 (cc) Cp = 119.57 (J/K)

Oxygen delta moles = -0.00302227 delta grams = -0.0967091
G = 706.78 (J) H = -74.22 (J) S = -0.74 (J/K) V = -264.64 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 770.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = 0.07 COH = 1.37 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 19.13 (gm) density = 2.35 (gm/cc) viscosity = 6.61 (log 10 poise) (analysis in wt %)
G = -310651.75 (J) H = -260906.11 (J) S = 47.69 (J/K) V = 8.14 (cc) Cp = 25.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.10 | 0.37 | 18.57 | 0.09 | 0.00 | 0.29 | 0.20 | 0.18 | 0.00 | 0.00 | 1.05 | 1.40 | 5.58 | 0.47 | 4.70 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.29 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.58Mg0.36)3Al2Si3O12
G = -301933.43 (J) H = -257934.03 (J) S = 42.18 (J/K) V = 5.66 (cc) Cp = 24.24 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.54 | 6.08 | 36.38 |

biotite mass = 2.49 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -39958.86 (J) H = -34306.17 (J) S = 5.42 (J/K) V = 0.91 (cc) Cp = 3.15 (J/K)

| annite | phlogopite |
|---|---|
| 1.69 | 98.31 |

feldspar mass = 18.67 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.71Ca0.20Al1.20Si2.80O8
G = -301554.25 (J) H = -260455.53 (J) S = 39.40 (J/K) V = 7.18 (cc) Cp = 22.69 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.35 | 19.52 | 9.14 |

feldspar mass = 19.89 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -311412.84 (J) H = -268416.95 (J) S = 41.22 (J/K) V = 7.85 (cc) Cp = 23.50 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.94 | 1.67 | 66.39 |

quartz mass = 15.93 (gm) density = 2.55 (gm/cc)
SiO2
G = -258784.82 (J) H = -225821.63 (J) S = 31.60 (J/K) V = 6.25 (cc) Cp = 18.49 (J/K)

rhm-oxide mass = 1.49 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.14Fe'"0.10Al0.14Ti0.88O3
G = -15019.34 (J) H = -12211.82 (J) S = 2.69 (J/K) V = 0.33 (cc) Cp = 1.39 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.60 | 5.01 | 71.18 | 2.95 | 7.25 |

Total solids mass = 80.77 (gm) density = 2.87 (gm/cc)
G = -1228663.54 (J) H = -1059146.13 (J) S = 162.51 (J/K) V = 28.17 (cc) Cp = 93.47 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.75 (gm/cc)
G = -1539315.29 (J) H = -1320052.24 (J) S = 210.19 (J/K) V = 36.31 (cc) Cp = 119.41 (J/K)

Oxygen delta moles = -0.00304537 delta grams = -0.0974482
G = 704.71 (J) H = -73.72 (J) S = -0.75 (J/K) V = -264.13 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 760.00 (C) P = 5.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = 0.07 COH = 1.34 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 18.00 (gm) density = 2.35 (gm/cc) viscosity = 6.57 (log 10 poise) (analysis in wt %)
G = -292319.74 (J) H = -245945.86 (J) S = 44.89 (J/K) V = 7.66 (cc) Cp = 24.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.55 | 0.35 | 19.07 | 0.08 | 0.00 | 0.26 | 0.21 | 0.16 | 0.00 | 0.00 | 1.05 | 1.34 | 5.49 | 0.50 | 4.94 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.05 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.58Mg0.36)3Al2Si3O12
G = -297427.85 (J) H = -254599.79 (J) S = 41.45 (J/K) V = 5.59 (cc) Cp = 23.91 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.30 | 5.97 | 35.73 |

biotite mass = 2.74 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -43893.93 (J) H = -37769.95 (J) S = 5.93 (J/K) V = 1.00 (cc) Cp = 3.46 (J/K)

| annite | phlogopite |
|---|---|
| 1.71 | 98.29 |

feldspar mass = 19.13 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.20Al1.20Si2.80O8
G = -308604.38 (J) H = -267140.29 (J) S = 40.13 (J/K) V = 7.35 (cc) Cp = 23.31 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.52 | 19.82 | 8.66 |

feldspar mass = 20.09 (gm) density = 2.53 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -314030.77 (J) H = -271276.33 (J) S = 41.38 (J/K) V = 7.93 (cc) Cp = 23.75 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.97 | 1.55 | 67.48 |

quartz mass = 16.38 (gm) density = 2.55 (gm/cc)
SiO2
G = -265771.86 (J) H = -232391.46 (J) S = 32.31 (J/K) V = 6.42 (cc) Cp = 18.99 (J/K)

rhm-oxide mass = 1.51 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.13Fe'"0.09Al0.15Ti0.88O3
G = -15160.52 (J) H = -12365.97 (J) S = 2.70 (J/K) V = 0.33 (cc) Cp = 1.41 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.20 | 4.71 | 71.57 | 3.00 | 7.52 |

Total solids mass = 81.90 (gm) density = 2.86 (gm/cc)
G = -1244889.31 (J) H = -1075543.78 (J) S = 163.91 (J/K) V = 28.62 (cc) Cp = 94.83 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.75 (gm/cc)
G = -1537209.05 (J) H = -1321489.65 (J) S = 208.80 (J/K) V = 36.28 (cc) Cp = 119.30 (J/K)

Oxygen delta moles = -0.00306701 delta grams = -0.0981406
G = 702.21 (J) H = -73.17 (J) S = -0.75 (J/K) V = -263.45 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 750.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -15.01  delta HM = -5.18  NNO = 0.00  QFM = 0.06  COH = 1.30  IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid  mass = 16.96 (gm)  density = 2.35 (gm/cc)  viscosity = 6.52 (log 10 poise)  (analysis in wt %)
G = -275482.55 (J)  H = -232186.06 (J)  S = 42.32 (J/K)  V = 7.22 (cc)  Cp = 23.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.98 | 0.33 | 19.58 | 0.07 | 0.00 | 0.23 | 0.22 | 0.14 | 0.00 | 0.00 | 1.05 | 1.29 | 5.39 | 0.53 | 5.18 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 21.82 (gm)  density = 3.95 (gm/cc)  (analysis in mole %)
(Ca0.06Fe"0.59Mg0.35)3Al2Si3O12
G = -293238.63 (J)  H = -251526.78 (J)  S = 40.77 (J/K)  V = 5.52 (cc)  Cp = 23.61 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.02 | 5.86 | 35.13 |

biotite  mass = 2.97 (gm)  density = 2.75 (gm/cc)  (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -47439.24 (J)  H = -40913.03 (J)  S = 6.38 (J/K)  V = 1.08 (cc)  Cp = 3.74 (J/K)

| annite | phlogopite |
|---|---|
| 1.71 | 98.29 |

feldspar  mass = 19.55 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.08Na0.72Ca0.20Al1.20Si2.80O8
G = -315062.72 (J)  H = -273338.01 (J)  S = 40.78 (J/K)  V = 7.51 (cc)  Cp = 23.93 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.70 | 20.09 | 8.21 |

feldspar  mass = 20.28 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -316389.32 (J)  H = -273921.15 (J)  S = 41.51 (J/K)  V = 8.00 (cc)  Cp = 23.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.02 | 1.44 | 68.54 |

quartz  mass = 16.80 (gm)  density = 2.55 (gm/cc)
SiO2
G = -272216.03 (J)  H = -238509.77 (J)  S = 32.94 (J/K)  V = 6.59 (cc)  Cp = 19.45 (J/K)

rhm-oxide  mass = 1.52 (gm)  density = 4.58 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.13Fe'"0.09Al0.16Ti0.88O3
G = -15288.96 (J)  H = -12510.66 (J)  S = 2.72 (J/K)  V = 0.33 (cc)  Cp = 1.42 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.83 | 4.42 | 71.91 | 3.04 | 7.81 |

Total solids  mass = 82.94 (gm)  density = 2.86 (gm/cc)
G = -1259634.90 (J)  H = -1090719.40 (J)  S = 165.09 (J/K)  V = 29.03 (cc)  Cp = 96.13 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.76 (gm/cc)
G = -1535117.45 (J)  H = -1322905.46 (J)  S = 207.41 (J/K)  V = 36.25 (cc)  Cp = 119.25 (J/K)

Oxygen delta moles = -0.00308728 delta grams = -0.0987893
G = 699.30 (J) H = -72.58 (J) S = -0.75 (J/K) V = -262.63 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 740.00 (C) P = 5.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = 0.05 COH = 1.27 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 16.00 (gm) density = 2.35 (gm/cc) viscosity = 6.46 (log 10 poise) (analysis in wt %)
G = -259924.10 (J) H = -219451.00 (J) S = 39.95 (J/K) V = 6.82 (cc) Cp = 21.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.36 | 0.31 | 20.12 | 0.07 | 0.00 | 0.21 | 0.23 | 0.13 | 0.00 | 0.00 | 1.06 | 1.23 | 5.28 | 0.57 | 5.44 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 21.62 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.60Mg0.35)3Al2Si3O12
G = -289338.64 (J) H = -248692.64 (J) S = 40.12 (J/K) V = 5.46 (cc) Cp = 23.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.69 | 5.74 | 34.57 |

biotite mass = 3.17 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -50638.69 (J) H = -43771.10 (J) S = 6.78 (J/K) V = 1.15 (cc) Cp = 3.99 (J/K)

| annite | phlogopite |
|---|---|
| 1.70 | 98.30 |

feldspar mass = 19.94 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.72Ca0.20Al1.20Si2.80O8
G = -321014.80 (J) H = -279120.04 (J) S = 41.35 (J/K) V = 7.65 (cc) Cp = 24.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.87 | 20.35 | 7.79 |

feldspar mass = 20.46 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -318521.48 (J) H = -276378.58 (J) S = 41.60 (J/K) V = 8.07 (cc) Cp = 24.22 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.10 | 1.33 | 69.56 |

quartz mass = 17.19 (gm) density = 2.55 (gm/cc)
SiO2
G = -278195.05 (J) H = -244241.83 (J) S = 33.51 (J/K) V = 6.74 (cc) Cp = 19.88 (J/K)

rhm-oxide mass = 1.53 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.72Mg0.12Fe'"0.08Al0.16Ti0.88O3
G = -15407.63 (J) H = -12648.21 (J) S = 2.72 (J/K) V = 0.33 (cc) Cp = 1.43 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.49 | 4.13 | 72.20 | 3.07 | 8.11 |

Total solids mass = 83.90 (gm) density = 2.85 (gm/cc)

G = -1273116.28 (J)  H = -1104852.41 (J)  S = 166.08 (J/K)  V = 29.41 (cc)  Cp = 97.39 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.76 (gm/cc)
G = -1533040.38 (J)  H = -1324303.40 (J)  S = 206.03 (J/K)  V = 36.22 (cc)  Cp = 119.27 (J/K)

Oxygen  delta moles = -0.00310628  delta grams = -0.0993971
G = 696.02 (J)  H = -71.94 (J)  S = -0.76 (J/K)  V = -261.66 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 730.00 (C)  P = 5.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = 0.04  COH = 1.24  IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 14.97 (gm)  density = 2.34 (gm/cc)  viscosity = 6.36 (log 10 poise)  (analysis in wt %)
G = -243288.91 (J)  H = -205719.53 (J)  S = 37.45 (J/K)  V = 6.38 (cc)  Cp = 20.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.72 | 0.29 | 20.60 | 0.06 | 0.00 | 0.19 | 0.25 | 0.11 | 0.00 | 0.00 | 1.08 | 1.20 | 5.16 | 0.61 | 5.74 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 21.37 (gm)  density = 3.96 (gm/cc)  (analysis in mole %)
(Ca0.06Fe"0.60Mg0.34)3Al2Si3O12
G = -284795.37 (J)  H = -245281.04 (J)  S = 39.39 (J/K)  V = 5.39 (cc)  Cp = 22.99 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.48 | 5.66 | 33.86 |

biotite  mass = 3.42 (gm)  density = 2.75 (gm/cc)  (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -54517.84 (J)  H = -47229.76 (J)  S = 7.27 (J/K)  V = 1.24 (cc)  Cp = 4.30 (J/K)

| annite | phlogopite |
|---|---|
| 1.72 | 98.28 |

feldspar  mass = 20.28 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.07Na0.72Ca0.21Al1.21Si2.79O8
G = -326092.31 (J)  H = -284162.16 (J)  S = 41.80 (J/K)  V = 7.78 (cc)  Cp = 25.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.06 | 20.55 | 7.39 |

feldspar  mass = 20.63 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -320641.36 (J)  H = -278833.37 (J)  S = 41.68 (J/K)  V = 8.13 (cc)  Cp = 24.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.23 | 1.24 | 70.53 |

quartz  mass = 17.62 (gm)  density = 2.55 (gm/cc)
SiO2
G = -284762.42 (J)  H = -250511.87 (J)  S = 34.14 (J/K)  V = 6.91 (cc)  Cp = 20.34 (J/K)

sillimanite  mass = 0.08 (gm)  density = 3.23 (gm/cc)

Al2SiO5
G = -1358.07 (J)  H = -1210.99 (J)  S = 0.15 (J/K)  V = 0.02 (cc)  Cp = 0.10 (J/K)

rhm-oxide  mass = 1.55 (gm)  density = 4.58 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.73Mg0.12Fe'"0.08Al0.17Ti0.88O3
G = -15522.53 (J)  H = -12781.69 (J)  S = 2.73 (J/K)  V = 0.34 (cc)  Cp = 1.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.09 | 3.89 | 72.56 | 3.10 | 8.36 |

Total solids  mass = 84.93 (gm)  density = 2.85 (gm/cc)
G = -1287689.90 (J)  H = -1120010.88 (J)  S = 167.15 (J/K)  V = 29.81 (cc)  Cp = 98.82 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.76 (gm/cc)
G = -1530978.80 (J)  H = -1325730.41 (J)  S = 204.60 (J/K)  V = 36.20 (cc)  Cp = 119.36 (J/K)

Oxygen  delta moles = -0.00312211  delta grams = -0.0999037
G = 691.95 (J)  H = -71.22 (J)  S = -0.76 (J/K)  V = -260.40 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 1300.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.39  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.51 (log 10 poise)  (analysis in wt %)
G = -1669403.55 (J)  H = -1226683.47 (J)  S = 281.42 (J/K)  V = 40.04 (cc)  Cp = 143.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.80 | 16.91 | 1.04 | 0.00 | 5.77 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.51 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1669403.55 (J)  H = -1226683.47 (J)  S = 281.42 (J/K)  V = 40.04 (cc)  Cp = 143.70 (J/K)

Oxygen  delta moles = -2.67147e-16  delta grams = -8.5484e-15
G = 0.00 (J)  H = -0.00 (J)  S = -0.00 (J/K)  V = -0.00 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1290.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.34  COH = 2.38  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.56 (log 10 poise)  (analysis in wt %)
G = -1666596.03 (J)  H = -1228122.17 (J)  S = 280.51 (J/K)  V = 40.01 (cc)  Cp = 143.69 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.80 | 16.91 | 1.04 | 0.00 | 5.77 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1666596.03 (J)  H = -1228122.17 (J)  S = 280.51 (J/K)  V = 40.01 (cc)  Cp = 143.69 (J/K)

Oxygen  delta moles = 3.88563e-06  delta grams = 0.000124335
G = -1.41 (J)  H = 0.17 (J)  S = 0.00 (J/K)  V = 0.50 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1280.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.36  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1663797.94 (J)  H = -1229561.00 (J)  S = 279.58 (J/K)  V = 39.98 (cc)  Cp = 143.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.80 | 16.91 | 1.04 | 0.00 | 5.77 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1663797.94 (J)  H = -1229561.00 (J)  S = 279.58 (J/K)  V = 39.98 (cc)  Cp = 143.68 (J/K)

Oxygen  delta moles = 8.21295e-06  delta grams = 0.000262805
G = -2.96 (J)  H = 0.35 (J)  S = 0.00 (J/K)  V = 1.06 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1270.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.33  COH = 2.35  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.50 (gm/cc)  viscosity = 3.67 (log 10 poise)  (analysis in wt %)
G = -1661009.35 (J)  H = -1230999.97 (J)  S = 278.66 (J/K)  V = 39.95 (cc)  Cp = 143.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.80 | 16.91 | 1.04 | 0.00 | 5.77 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.67 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.50 (gm/cc)
G = -1661009.35 (J)  H = -1230999.97 (J)  S = 278.66 (J/K)  V = 39.95 (cc)  Cp = 143.67 (J/K)

Oxygen  delta moles = 1.29945e-05  delta grams = 0.000415808
G = -4.65 (J)  H = 0.55 (J)  S = 0.00 (J/K)  V = 1.67 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1260.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.33  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.72 (log 10 poise)  (analysis in wt %)
G = -1658230.32 (J)  H = -1232439.10 (J)  S = 277.72 (J/K)  V = 39.92 (cc)  Cp = 143.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.80 | 16.91 | 1.04 | 0.00 | 5.76 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.72 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1658230.32 (J)  H = -1232439.10 (J)  S = 277.72 (J/K)  V = 39.92 (cc)  Cp = 143.67 (J/K)

Oxygen  delta moles = 1.82433e-05  delta grams = 0.000583762
G = -6.48 (J)  H = 0.76 (J)  S = 0.00 (J/K)  V = 2.33 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1250.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.32  COH = 2.32  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.51 (gm/cc)  viscosity = 3.78 (log 10 poise)  (analysis in wt %)
G = -1655460.92 (J)  H = -1233878.39 (J)  S = 276.78 (J/K)  V = 39.88 (cc)  Cp = 143.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.41 | 0.80 | 16.91 | 1.04 | 0.00 | 5.76 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.78 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.51 (gm/cc)
G = -1655460.92 (J)  H = -1233878.39 (J)  S = 276.78 (J/K)  V = 39.88 (cc)  Cp = 143.66 (J/K)

Oxygen  delta moles = 2.39729e-05  delta grams = 0.000767103
G = -8.45 (J)  H = 0.99 (J)  S = 0.01 (J/K)  V = 3.04 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1240.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -7.12  delta HM = -4.84  NNO = 0.00  QFM = 0.31  COH = 2.30  IW

= 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 99.31 (gm) density = 2.51 (gm/cc) viscosity = 3.86 (log 10 poise) (analysis in wt %)
G = -1641891.27 (J) H = -1227337.50 (J) S = 273.97 (J/K) V = 39.61 (cc) Cp = 142.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.48 | 0.80 | 17.01 | 1.04 | 0.00 | 5.70 | 0.06 | 2.76 | 0.00 | 0.00 | 1.54 | 2.55 | 3.95 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 0.69 (gm) density = 3.29 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.45Mg1.47Fe'"0.03Ti0.00Al0.11Si1.93O6
G = -10798.01 (J) H = -8254.45 (J) S = 1.68 (J/K) V = 0.21 (cc) Cp = 0.86 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.91 | 98.74 | 44.62 | 4.33 | -3.92 | 6.96 | 0.18 |

Total solids mass = 0.69 (gm) density = 3.29 (gm/cc)
G = -10798.01 (J) H = -8254.45 (J) S = 1.68 (J/K) V = 0.21 (cc) Cp = 0.86 (J/K)

Viscosity of the System: 3.87 (log 10 poise)

System mass = 100.00 (gm) density = 2.51 (gm/cc)
G = -1652689.28 (J) H = -1235591.95 (J) S = 275.65 (J/K) V = 39.82 (cc) Cp = 143.41 (J/K)

Oxygen delta moles = 7.2198e-06 delta grams = 0.000231025
G = -2.53 (J) H = 0.30 (J) S = 0.00 (J/K) V = 0.91 (cc) Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1230.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.31 COH = 2.29 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 98.57 (gm) density = 2.51 (gm/cc) viscosity = 3.95 (log 10 poise) (analysis in wt %)
G = -1627515.45 (J) H = -1220162.16 (J) S = 271.00 (J/K) V = 39.33 (cc) Cp = 141.35 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.56 | 0.81 | 17.11 | 1.03 | 0.00 | 5.63 | 0.06 | 2.58 | 0.00 | 0.00 | 1.55 | 2.57 | 3.98 | 0.09 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.43 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.46Mg1.45Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -22411.33 (J) H = -17161.03 (J) S = 3.49 (J/K) V = 0.43 (cc) Cp = 1.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.70 | 98.68 | 46.30 | 4.44 | -4.03 | 7.13 | 0.19 |

Total solids mass = 1.43 (gm) density = 3.30 (gm/cc)
G = -22411.33 (J) H = -17161.03 (J) S = 3.49 (J/K) V = 0.43 (cc) Cp = 1.79 (J/K)

Viscosity of the System: 3.97 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1649926.78 (J) H = -1237323.18 (J) S = 274.49 (J/K) V = 39.76 (cc) Cp = 143.14 (J/K)

Oxygen delta moles = -1.38938e-05 delta grams = -0.000444586
G = 4.83 (J) H = -0.57 (J) S = -0.00 (J/K) V = -1.74 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1220.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.30 COH = 2.27 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 97.84 (gm) density = 2.51 (gm/cc) viscosity = 4.04 (log 10 poise) (analysis in wt %)
G = -1613620.04 (J) H = -1213302.84 (J) S = 268.10 (J/K) V = 39.05 (cc) Cp = 140.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.64 | 0.81 | 17.22 | 1.02 | 0.00 | 5.56 | 0.06 | 2.41 | 0.00 | 0.00 | 1.56 | 2.59 | 4.01 | 0.09 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.16 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.48Mg1.43Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -33554.75 (J) H = -25736.70 (J) S = 5.24 (J/K) V = 0.65 (cc) Cp = 2.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -54.56 | 98.62 | 48.03 | 4.56 | -4.15 | 7.30 | 0.19 |

Total solids mass = 2.16 (gm) density = 3.31 (gm/cc)
G = -33554.75 (J) H = -25736.70 (J) S = 5.24 (J/K) V = 0.65 (cc) Cp = 2.68 (J/K)

Viscosity of the System: 4.07 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1647174.79 (J) H = -1239039.54 (J) S = 273.34 (J/K) V = 39.70 (cc) Cp = 142.88 (J/K)

Oxygen delta moles = -3.68998e-05 delta grams = -0.00118075
G = 12.72 (J) H = -1.49 (J) S = -0.01 (J/K) V = -4.58 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1210.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.30 COH = 2.25 IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 97.13 (gm) density = 2.51 (gm/cc) viscosity = 4.13 (log 10 poise) (analysis in wt %)
G = -1600163.95 (J) H = -1206731.48 (J) S = 265.27 (J/K) V = 38.77 (cc) Cp = 139.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.72 | 0.82 | 17.32 | 1.01 | 0.00 | 5.47 | 0.06 | 2.25 | 0.00 | 0.00 | 1.57 | 2.61 | 4.04 | 0.09 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.86 (gm) density = 3.32 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.01Fe"0.50Mg1.41Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -44269.24 (J) H = -34010.81 (J) S = 6.92 (J/K) V = 0.86 (cc) Cp = 3.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -56.47 | 98.55 | 49.81 | 4.69 | -4.27 | 7.48 | 0.20 |

Total solids mass = 2.86 (gm) density = 3.32 (gm/cc)
G = -44269.24 (J) H = -34010.81 (J) S = 6.92 (J/K) V = 0.86 (cc) Cp = 3.55 (J/K)

Viscosity of the System: 4.17 (log 10 poise)

System mass = 100.00 (gm) density = 2.52 (gm/cc)
G = -1644433.20 (J) H = -1240742.29 (J) S = 272.18 (J/K) V = 39.64 (cc) Cp = 142.62 (J/K)

Oxygen delta moles = -6.19877e-05 delta grams = -0.00198353
G = 21.21 (J) H = -2.48 (J) S = -0.02 (J/K) V = -7.64 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1200.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.29 COH = 2.24 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 96.44 (gm) density = 2.50 (gm/cc) viscosity = 4.22 (log 10 poise) (analysis in wt %)
G = -1587106.96 (J) H = -1200375.92 (J) S = 262.52 (J/K) V = 38.51 (cc) Cp = 131.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.81 | 0.82 | 17.42 | 1.00 | 0.00 | 5.38 | 0.06 | 2.09 | 0.00 | 0.00 | 1.57 | 2.63 | 4.07 | 0.09 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.55 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.52Mg1.39Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -54594.83 (J) H = -42012.24 (J) S = 8.54 (J/K) V = 1.07 (cc) Cp = 4.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.43 | 98.49 | 51.64 | 4.82 | -4.39 | 7.66 | 0.21 |

Total solids mass = 3.55 (gm) density = 3.33 (gm/cc)
G = -54594.83 (J) H = -42012.24 (J) S = 8.54 (J/K) V = 1.07 (cc) Cp = 4.39 (J/K)

Viscosity of the System: 4.27 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1641701.79 (J) H = -1242388.16 (J) S = 271.06 (J/K) V = 39.58 (cc) Cp = 135.88 (J/K)

Oxygen delta moles = -8.93558e-05 delta grams = -0.00285928
G = 30.34 (J) H = -3.54 (J) S = -0.02 (J/K) V = -10.94 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1190.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.29 COH = 2.22 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 95.77 (gm) density = 2.50 (gm/cc) viscosity = 4.31 (log 10 poise) (analysis in wt %)
G = -1574407.88 (J) H = -1194231.92 (J) S = 259.83 (J/K) V = 38.25 (cc) Cp = 130.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.89 | 0.83 | 17.52 | 0.99 | 0.00 | 5.28 | 0.06 | 1.95 | 0.00 | 0.00 | 1.58 | 2.65 | 4.10 | 0.09 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.23 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.54Mg1.37Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -64572.27 (J) H = -49770.73 (J) S = 10.12 (J/K) V = 1.27 (cc) Cp = 5.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.45 | 98.42 | 53.53 | 4.95 | -4.52 | 7.85 | 0.22 |

Total solids mass = 4.23 (gm) density = 3.34 (gm/cc)
G = -64572.27 (J) H = -49770.73 (J) S = 10.12 (J/K) V = 1.27 (cc) Cp = 5.20 (J/K)

Viscosity of the System: 4.37 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1638980.15 (J) H = -1244002.65 (J) S = 269.95 (J/K) V = 39.52 (cc) Cp = 135.65 (J/K)

Oxygen delta moles = -0.00011922 delta grams = -0.0038149
G = 40.18 (J) H = -4.68 (J) S = -0.03 (J/K) V = -14.50 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1180.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.28 COH = 2.20 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 95.10 (gm) density = 2.50 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -1562035.40 (J) H = -1188298.20 (J) S = 257.19 (J/K) V = 38.00 (cc) Cp = 129.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.98 | 0.83 | 17.62 | 0.97 | 0.00 | 5.18 | 0.06 | 1.81 | 0.00 | 0.00 | 1.59 | 2.67 | 4.13 | 0.10 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.89 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.55Mg1.34Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -74232.76 (J) H = -57308.96 (J) S = 11.65 (J/K) V = 1.46 (cc) Cp = 6.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.52 | 98.35 | 55.46 | 5.10 | -4.66 | 8.05 | 0.23 |

Total solids mass = 4.89 (gm) density = 3.35 (gm/cc)
G = -74232.76 (J) H = -57308.96 (J) S = 11.65 (J/K) V = 1.46 (cc) Cp = 6.00 (J/K)

Viscosity of the System: 4.47 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1636268.16 (J) H = -1245607.16 (J) S = 268.84 (J/K) V = 39.46 (cc) Cp = 135.43 (J/K)

Oxygen delta moles = -0.00015177 delta grams = -0.00485646
G = 50.75 (J) H = -5.90 (J) S = -0.04 (J/K) V = -18.34 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1170.00 (C) P = 6.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.27 COH = 2.18 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 94.45 (gm) density = 2.50 (gm/cc) viscosity = 4.50 (log 10 poise) (analysis in wt %)
G = -1549962.03 (J) H = -1182555.49 (J) S = 254.59 (J/K) V = 37.75 (cc) Cp = 128.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.08 | 0.84 | 17.71 | 0.96 | 0.00 | 5.07 | 0.06 | 1.68 | 0.00 | 0.00 | 1.60 | 2.68 | 4.16 | 0.10 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.54 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.57Mg1.32Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -83603.73 (J) H = -64647.00 (J) S = 13.14 (J/K) V = 1.65 (cc) Cp = 6.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.64 | 98.28 | 57.44 | 5.24 | -4.81 | 8.25 | 0.23 |

Total solids mass = 5.54 (gm) density = 3.36 (gm/cc)
G = -83603.73 (J) H = -64647.00 (J) S = 13.14 (J/K) V = 1.65 (cc) Cp = 6.78 (J/K)

Viscosity of the System: 4.57 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1633565.76 (J) H = -1247202.49 (J) S = 267.72 (J/K) V = 39.40 (cc) Cp = 135.21 (J/K)

Oxygen delta moles = -0.00018718 delta grams = -0.00598954
G = 62.12 (J) H = -7.21 (J) S = -0.05 (J/K) V = -22.46 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1160.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.27 COH = 2.17 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 93.81 (gm) density = 2.50 (gm/cc) viscosity = 4.59 (log 10 poise) (analysis in wt %)
G = -1538163.85 (J) H = -1176986.88 (J) S = 252.02 (J/K) V = 37.51 (cc) Cp = 127.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.17 | 0.84 | 17.81 | 0.94 | 0.00 | 4.94 | 0.06 | 1.56 | 0.00 | 0.00 | 1.60 | 2.70 | 4.18 | 0.10 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.19 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.59Mg1.30Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -92709.04 (J) H = -71802.43 (J) S = 14.59 (J/K) V = 1.84 (cc) Cp = 7.54 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-66.80 98.21 59.45 5.40 -4.96 8.46 0.24

Total solids mass = 6.19 (gm) density = 3.37 (gm/cc)
G = -92709.04 (J) H = -71802.43 (J) S = 14.59 (J/K) V = 1.84 (cc) Cp = 7.54 (J/K)

Viscosity of the System: 4.68 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1630872.89 (J) H = -1248789.32 (J) S = 266.60 (J/K) V = 39.35 (cc) Cp = 134.99 (J/K)

Oxygen delta moles = -0.000225605 delta grams = -0.00721908
G = 74.29 (J) H = -8.61 (J) S = -0.06 (J/K) V = -26.88 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1150.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.26 COH = 2.15 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 93.17 (gm) density = 2.50 (gm/cc) viscosity = 4.69 (log 10 poise) (analysis in wt %)
G = -1526620.77 (J) H = -1171578.02 (J) S = 249.48 (J/K) V = 37.27 (cc) Cp = 126.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.27 | 0.85 | 17.90 | 0.93 | 0.00 | 4.82 | 0.06 | 1.45 | 0.00 | 0.00 | 1.61 | 2.72 | 4.21 | 0.10 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.82 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.61Mg1.28Fe'"0.04Ti0.00Al0.14Si1.91O6
G = -101568.74 (J) H = -78790.16 (J) S = 16.01 (J/K) V = 2.02 (cc) Cp = 8.28 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-68.98 98.14 61.48 5.57 -5.13 8.68 0.25

Total solids mass = 6.82 (gm) density = 3.38 (gm/cc)
G = -101568.74 (J) H = -78790.16 (J) S = 16.01 (J/K) V = 2.02 (cc) Cp = 8.28 (J/K)

Viscosity of the System: 4.78 (log 10 poise)

System mass = 99.99 (gm) density = 2.54 (gm/cc)
G = -1628189.51 (J) H = -1250368.18 (J) S = 265.48 (J/K) V = 39.29 (cc) Cp = 134.78 (J/K)

Oxygen delta moles = -0.00026717 delta grams = -0.00854913
G = 87.29 (J) H = -10.09 (J) S = -0.07 (J/K) V = -31.61 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1140.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.26 COH = 2.13 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 92.54 (gm) density = 2.50 (gm/cc) viscosity = 4.79 (log 10 poise) (analysis in wt %)
G = -1515316.81 (J) H = -1166317.31 (J) S = 246.97 (J/K) V = 37.04 (cc) Cp = 125.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.38 | 0.85 | 18.00 | 0.91 | 0.00 | 4.68 | 0.07 | 1.34 | 0.00 | 0.00 | 1.62 | 2.74 | 4.24 | 0.10 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.45 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.64Mg1.25Fe'"0.04Ti0.00Al0.15Si1.91O6
G = -110198.82 (J) H = -85622.21 (J) S = 17.39 (J/K) V = 2.20 (cc) Cp = 9.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.20 | 98.06 | 63.53 | 5.74 | -5.30 | 8.90 | 0.26 |

Total solids mass = 7.45 (gm) density = 3.39 (gm/cc)
G = -110198.82 (J) H = -85622.21 (J) S = 17.39 (J/K) V = 2.20 (cc) Cp = 9.01 (J/K)

Viscosity of the System: 4.89 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1625515.63 (J) H = -1251939.52 (J) S = 264.36 (J/K) V = 39.23 (cc) Cp = 134.57 (J/K)

Oxygen delta moles = -0.000311971 delta grams = -0.00998269
G = 101.13 (J) H = -11.67 (J) S = -0.08 (J/K) V = -36.65 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1130.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.25 COH = 2.11 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 91.92 (gm) density = 2.50 (gm/cc) viscosity = 4.89 (log 10 poise) (analysis in wt %)
G = -1504240.23 (J) H = -1161196.06 (J) S = 244.48 (J/K) V = 36.80 (cc) Cp = 124.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.49 | 0.86 | 18.09 | 0.89 | 0.00 | 4.53 | 0.07 | 1.24 | 0.00 | 0.00 | 1.63 | 2.76 | 4.27 | 0.10 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.07 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.66Mg1.23Fe'"0.04Ti0.00Al0.15Si1.90O6
G = -118611.01 (J) H = -92307.54 (J) S = 18.75 (J/K) V = 2.38 (cc) Cp = 9.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.42 | 97.99 | 65.59 | 5.92 | -5.48 | 9.14 | 0.27 |

Total solids mass = 8.07 (gm) density = 3.40 (gm/cc)
G = -118611.01 (J) H = -92307.54 (J) S = 18.75 (J/K) V = 2.38 (cc) Cp = 9.73 (J/K)

Viscosity of the System: 5.00 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1622851.24 (J) H = -1253503.61 (J) S = 263.23 (J/K) V = 39.18 (cc) Cp = 134.36 (J/K)

Oxygen delta moles = -0.000360059 delta grams = -0.0115214

G = 115.80 (J)  H = -13.34 (J)  S = -0.09 (J/K)  V = -42.01 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1120.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.53  delta HM = -4.90  NNO = 0.00  QFM = 0.25  COH = 2.09  IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid  mass = 91.31 (gm)  density = 2.50 (gm/cc)  viscosity = 4.99 (log 10 poise)  (analysis in wt %)
G = -1493383.62 (J)  H = -1156208.57 (J)  S = 242.02 (J/K)  V = 36.58 (cc)  Cp = 123.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.60 | 0.86 | 18.18 | 0.86 | 0.00 | 4.38 | 0.07 | 1.14 | 0.00 | 0.00 | 1.63 | 2.77 | 4.30 | 0.10 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.68 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.68Mg1.20Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -126812.79 (J)  H = -98852.02 (J)  S = 20.07 (J/K)  V = 2.55 (cc)  Cp = 10.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.65 | 97.92 | 67.63 | 6.12 | -5.67 | 9.38 | 0.28 |

Total solids  mass = 8.68 (gm)  density = 3.41 (gm/cc)
G = -126812.79 (J)  H = -98852.02 (J)  S = 20.07 (J/K)  V = 2.55 (cc)  Cp = 10.43 (J/K)

Viscosity of the System: 5.11 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.56 (gm/cc)
G = -1620196.41 (J)  H = -1255060.59 (J)  S = 262.09 (J/K)  V = 39.12 (cc)  Cp = 134.15 (J/K)

Oxygen  delta moles = -0.00041144  delta grams = -0.0131656
G = 131.27 (J)  H = -15.10 (J)  S = -0.11 (J/K)  V = -47.66 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1110.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.24  COH = 2.07  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 90.70 (gm)  density = 2.49 (gm/cc)  viscosity = 5.09 (log 10 poise)  (analysis in wt %)
G = -1482743.81 (J)  H = -1151352.08 (J)  S = 239.59 (J/K)  V = 36.35 (cc)  Cp = 122.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.71 | 0.87 | 18.26 | 0.84 | 0.00 | 4.22 | 0.07 | 1.06 | 0.00 | 0.00 | 1.64 | 2.79 | 4.33 | 0.10 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.29 (gm)  density = 3.42 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.70Mg1.18Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -134807.39 (J)  H = -105258.41 (J)  S = 21.36 (J/K)  V = 2.72 (cc)  Cp = 11.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.87 | 97.85 | 69.67 | 6.32 | -5.87 | 9.62 | 0.29 |

Total solids mass = 9.29 (gm) density = 3.42 (gm/cc)
G = -134807.39 (J) H = -105258.41 (J) S = 21.36 (J/K) V = 2.72 (cc) Cp = 11.12 (J/K)

Viscosity of the System: 5.22 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1617551.20 (J) H = -1256610.48 (J) S = 260.96 (J/K) V = 39.07 (cc) Cp = 133.95 (J/K)

Oxygen delta moles = -0.00046607 delta grams = -0.0149137
G = 147.51 (J) H = -16.93 (J) S = -0.12 (J/K) V = -53.60 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1100.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.05 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 90.10 (gm) density = 2.49 (gm/cc) viscosity = 5.20 (log 10 poise) (analysis in wt %)
G = -1472321.57 (J) H = -1146626.66 (J) S = 237.19 (J/K) V = 36.13 (cc) Cp = 121.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.83 | 0.87 | 18.35 | 0.82 | 0.00 | 4.06 | 0.07 | 0.98 | 0.00 | 0.00 | 1.65 | 2.81 | 4.36 | 0.10 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.89 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.72Mg1.16Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -142594.13 (J) H = -111526.51 (J) S = 22.63 (J/K) V = 2.88 (cc) Cp = 11.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.06 | 97.78 | 71.67 | 6.53 | -6.08 | 9.87 | 0.29 |

Total solids mass = 9.89 (gm) density = 3.43 (gm/cc)
G = -142594.13 (J) H = -111526.51 (J) S = 22.63 (J/K) V = 2.88 (cc) Cp = 11.80 (J/K)

Viscosity of the System: 5.33 (log 10 poise)

System mass = 99.98 (gm) density = 2.56 (gm/cc)
G = -1614915.70 (J) H = -1258153.17 (J) S = 259.81 (J/K) V = 39.02 (cc) Cp = 133.75 (J/K)

Oxygen delta moles = -0.000523854 delta grams = -0.0167627
G = 164.46 (J) H = -18.84 (J) S = -0.13 (J/K) V = -59.81 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1090.00 (C) P = 6.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.23 COH = 2.03 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 89.51 (gm) density = 2.49 (gm/cc) viscosity = 5.30 (log 10 poise) (analysis in wt %)
G = -1462121.20 (J) H = -1142034.91 (J) S = 234.81 (J/K) V = 35.91 (cc) Cp = 121.09 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.95 0.88 18.44 0.79 0.00 3.89 0.07 0.90 0.00 0.00 1.65 2.83 4.39 0.10 1.12 0.00 0.00 0.00 0.00

orthopyroxene mass = 10.48 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.74Mg1.13Fe'"0.04Ti0.00Al0.17Si1.89O6
G = -150168.86 (J) H = -117653.52 (J) S = 23.85 (J/K) V = 3.05 (cc) Cp = 12.46 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-82.22 97.72 73.62 6.75 -6.30 10.13 0.30

Total solids mass = 10.48 (gm) density = 3.44 (gm/cc)
G = -150168.86 (J) H = -117653.52 (J) S = 23.85 (J/K) V = 3.05 (cc) Cp = 12.46 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System mass = 99.98 (gm) density = 2.57 (gm/cc)
G = -1612290.06 (J) H = -1259688.43 (J) S = 258.67 (J/K) V = 38.96 (cc) Cp = 133.56 (J/K)

Oxygen delta moles = -0.000584641 delta grams = -0.0187078
G = 182.06 (J) H = -20.82 (J) S = -0.15 (J/K) V = -66.26 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1080.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.22 COH = 2.01 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 88.92 (gm) density = 2.49 (gm/cc) viscosity = 5.41 (log 10 poise) (analysis in wt %)
G = -1452149.84 (J) H = -1137581.55 (J) S = 232.47 (J/K) V = 35.70 (cc) Cp = 120.25 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.07 0.88 18.52 0.76 0.00 3.72 0.07 0.83 0.00 0.00 1.66 2.85 4.41 0.10 1.13 0.00 0.00 0.00 0.00

orthopyroxene mass = 11.05 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.76Mg1.11Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -157524.57 (J) H = -123634.41 (J) S = 25.05 (J/K) V = 3.21 (cc) Cp = 13.11 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-84.33 97.65 75.53 6.98 -6.53 10.39 0.31

Total solids mass = 11.05 (gm) density = 3.45 (gm/cc)
G = -157524.57 (J) H = -123634.41 (J) S = 25.05 (J/K) V = 3.21 (cc) Cp = 13.11 (J/K)

Viscosity of the System: 5.56 (log 10 poise)

System mass = 99.98 (gm) density = 2.57 (gm/cc)
G = -1609674.41 (J) H = -1261215.96 (J) S = 257.52 (J/K) V = 38.91 (cc) Cp = 133.36 (J/K)

Oxygen delta moles = -0.000648232 delta grams = -0.0207426
G = 200.21 (J) H = -22.85 (J) S = -0.16 (J/K) V = -72.93 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1070.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.20  delta HM = -4.93  NNO = 0.00  QFM = 0.22  COH = 1.99  IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid  mass = 88.35 (gm)  density = 2.49 (gm/cc)  viscosity = 5.52 (log 10 poise)  (analysis in wt %)
G = -1442416.70 (J)  H = -1133272.87 (J)  S = 230.16 (J/K)  V = 35.49 (cc)  Cp = 119.43 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.19 | 0.89 | 18.60 | 0.73 | 0.00 | 3.54 | 0.07 | 0.77 | 0.00 | 0.00 | 1.66 | 2.86 | 4.44 | 0.10 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.62 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.77Mg1.09Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -164652.25 (J)  H = -129462.50 (J)  S = 26.20 (J/K)  V = 3.36 (cc)  Cp = 13.74 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.38 | 97.59 | 77.37 | 7.22 | -6.76 | 10.65 | 0.32 |

Total solids  mass = 11.62 (gm)  density = 3.46 (gm/cc)
G = -164652.25 (J)  H = -129462.50 (J)  S = 26.20 (J/K)  V = 3.36 (cc)  Cp = 13.74 (J/K)

Viscosity of the System: 5.68 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.57 (gm/cc)
G = -1607068.95 (J)  H = -1262735.37 (J)  S = 256.36 (J/K)  V = 38.86 (cc)  Cp = 133.17 (J/K)

Oxygen  delta moles = -0.000714381  delta grams = -0.0228593
G = 218.83 (J)  H = -24.92 (J)  S = -0.18 (J/K)  V = -79.78 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1060.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.34  delta HM = -4.93  NNO = 0.00  QFM = 0.21  COH = 1.97  IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid  mass = 87.80 (gm)  density = 2.49 (gm/cc)  viscosity = 5.63 (log 10 poise)  (analysis in wt %)
G = -1432932.16 (J)  H = -1129116.17 (J)  S = 227.89 (J/K)  V = 35.29 (cc)  Cp = 118.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.32 | 0.89 | 18.68 | 0.70 | 0.00 | 3.36 | 0.07 | 0.71 | 0.00 | 0.00 | 1.67 | 2.88 | 4.47 | 0.10 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.18 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.79Mg1.07Fe'"0.04Ti0.00Al0.19Si1.89O6
G = -171541.68 (J)  H = -135130.11 (J)  S = 27.31 (J/K)  V = 3.51 (cc)  Cp = 14.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.36 | 97.53 | 79.13 | 7.46 | -7.00 | 10.91 | 0.33 |

Total solids  mass = 12.18 (gm)  density = 3.47 (gm/cc)

G = -171541.68 (J)  H = -135130.11 (J)  S = 27.31 (J/K)  V = 3.51 (cc)  Cp = 14.36 (J/K)

Viscosity of the System: 5.80 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.58 (gm/cc)
G = -1604473.85 (J)  H = -1264246.28 (J)  S = 255.21 (J/K)  V = 38.81 (cc)  Cp = 132.98 (J/K)

Oxygen  delta moles = -0.000782807  delta grams = -0.0250489
G = 237.80 (J)  H = -27.03 (J)  S = -0.20 (J/K)  V = -86.77 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1050.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.48  delta HM = -4.94  NNO = 0.00  QFM = 0.20  COH = 1.95  IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid  mass = 87.25 (gm)  density = 2.49 (gm/cc)  viscosity = 5.74 (log 10 poise)  (analysis in wt %)
G = -1423706.89 (J)  H = -1125119.12 (J)  S = 225.66 (J/K)  V = 35.09 (cc)  Cp = 117.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.44 | 0.90 | 18.75 | 0.67 | 0.00 | 3.18 | 0.07 | 0.65 | 0.00 | 0.00 | 1.67 | 2.90 | 4.50 | 0.10 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 12.72 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.81Mg1.05Fe'"0.04Ti0.00Al0.19Si1.88O6
G = -178182.44 (J)  H = -140629.18 (J)  S = 28.38 (J/K)  V = 3.66 (cc)  Cp = 14.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -90.26 | 97.47 | 80.82 | 7.72 | -7.25 | 11.17 | 0.34 |

Total solids  mass = 12.72 (gm)  density = 3.47 (gm/cc)
G = -178182.44 (J)  H = -140629.18 (J)  S = 28.38 (J/K)  V = 3.66 (cc)  Cp = 14.95 (J/K)

Viscosity of the System: 5.92 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.58 (gm/cc)
G = -1601889.32 (J)  H = -1265748.30 (J)  S = 254.05 (J/K)  V = 38.75 (cc)  Cp = 132.80 (J/K)

Oxygen  delta moles = -0.000853193  delta grams = -0.0273012
G = 257.02 (J)  H = -29.15 (J)  S = -0.22 (J/K)  V = -93.86 (cc)  Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1040.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.20  COH = 1.93  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 86.72 (gm)  density = 2.48 (gm/cc)  viscosity = 5.85 (log 10 poise)  (analysis in wt %)
G = -1414750.94 (J)  H = -1121289.14 (J)  S = 223.48 (J/K)  V = 34.90 (cc)  Cp = 117.09 (J/K)

SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O  CO2  SO3  Cl2O-1  F2O-1

65.57 0.90 18.82 0.64 0.00 3.00 0.07 0.60 0.00 0.00 1.68 2.92 4.53 0.10 1.16 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.25 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.82Mg1.03Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -184564.63 (J) H = -145951.91 (J) S = 29.40 (J/K) V = 3.80 (cc) Cp = 15.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.08 | 97.41 | 82.41 | 7.98 | -7.51 | 11.43 | 0.35 |

Total solids mass = 13.25 (gm) density = 3.48 (gm/cc)
G = -184564.63 (J) H = -145951.91 (J) S = 29.40 (J/K) V = 3.80 (cc) Cp = 15.53 (J/K)

Viscosity of the System: 6.04 (log 10 poise)

System mass = 99.97 (gm) density = 2.58 (gm/cc)
G = -1599315.58 (J) H = -1267241.05 (J) S = 252.88 (J/K) V = 38.70 (cc) Cp = 132.61 (J/K)

Oxygen delta moles = -0.000925206 delta grams = -0.0296055
G = 276.36 (J) H = -31.27 (J) S = -0.23 (J/K) V = -101.01 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1030.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.19 COH = 1.91 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 83.95 (gm) density = 2.48 (gm/cc) viscosity = 5.97 (log 10 poise) (analysis in wt %)
G = -1369103.28 (J) H = -1088173.81 (J) S = 215.58 (J/K) V = 33.84 (cc) Cp = 113.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.84 | 0.93 | 18.80 | 0.61 | 0.00 | 2.83 | 0.07 | 0.55 | 0.00 | 0.00 | 1.60 | 2.82 | 4.65 | 0.11 | 1.20 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.93 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.85Mg1.01Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -192772.45 (J) H = -152701.88 (J) S = 30.75 (J/K) V = 3.99 (cc) Cp = 16.27 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.59 | 97.53 | 84.63 | 8.15 | -7.67 | 11.61 | 0.34 |

feldspar mass = 2.08 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.06Na0.67Ca0.27Al1.27Si2.73O8
G = -34857.00 (J) H = -28416.11 (J) S = 4.94 (J/K) V = 0.80 (cc) Cp = 2.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.72 | 26.92 | 6.36 |

Total solids mass = 16.01 (gm) density = 3.34 (gm/cc)
G = -227629.45 (J) H = -181117.99 (J) S = 35.69 (J/K) V = 4.79 (cc) Cp = 18.83 (J/K)

Viscosity of the System: 6.22 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1596732.73 (J) H = -1269291.80 (J) S = 251.27 (J/K) V = 38.62 (cc) Cp = 132.05 (J/K)

Oxygen delta moles = -0.00103907 delta grams = -0.0332491
G = 307.75 (J) H = -34.75 (J) S = -0.26 (J/K) V = -112.58 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1020.00 (C) P = 6.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.89 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 80.82 (gm) density = 2.48 (gm/cc) viscosity = 6.09 (log 10 poise) (analysis in wt %)
G = -1317538.98 (J) H = -1050129.81 (J) S = 206.79 (J/K) V = 32.63 (cc) Cp = 108.84 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.14 | 0.97 | 18.76 | 0.58 | 0.00 | 2.65 | 0.07 | 0.50 | 0.00 | 0.00 | 1.50 | 2.69 | 4.79 | 0.11 | 1.25 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.60 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.87Mg0.99Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -200738.79 (J) H = -159288.37 (J) S = 32.05 (J/K) V = 4.17 (cc) Cp = 17.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.07 | 97.69 | 86.81 | 8.29 | -7.81 | 11.75 | 0.34 |

feldspar mass = 4.54 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.67Ca0.26Al1.26Si2.74O8
G = -75885.32 (J) H = -61995.98 (J) S = 10.74 (J/K) V = 1.75 (cc) Cp = 5.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.37 | 25.85 | 6.77 |

Total solids mass = 19.15 (gm) density = 3.24 (gm/cc)
G = -276624.10 (J) H = -221284.35 (J) S = 42.79 (J/K) V = 5.91 (cc) Cp = 22.58 (J/K)

Viscosity of the System: 6.41 (log 10 poise)

System mass = 99.96 (gm) density = 2.59 (gm/cc)
G = -1594163.09 (J) H = -1271414.16 (J) S = 249.58 (J/K) V = 38.54 (cc) Cp = 131.42 (J/K)

Oxygen delta moles = -0.00116009 delta grams = -0.0371214
G = 340.66 (J) H = -38.38 (J) S = -0.29 (J/K) V = -124.73 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1010.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.18 COH = 1.86 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 77.90 (gm) density = 2.47 (gm/cc) viscosity = 6.21 (log 10 poise) (analysis in wt %)
G = -1269635.97 (J) H = -1014786.81 (J) S = 198.61 (J/K) V = 31.50 (cc) Cp = 104.78 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

66.42 1.00 18.72 0.54 0.00 2.47 0.08 0.46 0.00 0.00 1.42 2.56 4.93 0.12 1.29 0.00 0.00 0.00 0.00

orthopyroxene mass = 15.21 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.89Mg0.97Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -207915.03 (J) H = -165288.37 (J) S = 33.22 (J/K) V = 4.33 (cc) Cp = 17.67 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-99.30 97.83 88.78 8.44 -7.95 11.87 0.33

feldspar mass = 6.84 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -114061.51 (J) H = -93386.24 (J) S = 16.11 (J/K) V = 2.63 (cc) Cp = 8.39 (J/K)
albite anorthite sanidine
67.90 24.91 7.18

Total solids mass = 22.06 (gm) density = 3.17 (gm/cc)
G = -321976.54 (J) H = -258674.62 (J) S = 49.33 (J/K) V = 6.96 (cc) Cp = 26.06 (J/K)

Viscosity of the System: 6.60 (log 10 poise)

System mass = 99.96 (gm) density = 2.60 (gm/cc)
G = -1591612.52 (J) H = -1273461.43 (J) S = 247.95 (J/K) V = 38.46 (cc) Cp = 130.84 (J/K)

Oxygen delta moles = -0.00127672 delta grams = -0.0408534
G = 371.68 (J) H = -41.78 (J) S = -0.32 (J/K) V = -136.21 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 1000.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.17 COH = 1.84 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 75.20 (gm) density = 2.47 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -1225291.92 (J) H = -982081.68 (J) S = 191.03 (J/K) V = 30.45 (cc) Cp = 101.03 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.69 1.04 18.69 0.51 0.00 2.30 0.08 0.42 0.00 0.00 1.34 2.42 5.06 0.12 1.34 0.00 0.00 0.00 0.00

orthopyroxene mass = 15.77 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg0.95Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -214344.56 (J) H = -170733.71 (J) S = 34.25 (J/K) V = 4.48 (cc) Cp = 18.27 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.29 97.96 90.53 8.59 -8.09 11.98 0.32

feldspar mass = 8.98 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.68Ca0.24Al1.24Si2.76O8
G = -149444.43 (J) H = -122621.76 (J) S = 21.07 (J/K) V = 3.46 (cc) Cp = 11.00 (J/K)
albite anorthite sanidine
68.32 24.09 7.59

Total solids mass = 24.75 (gm) density = 3.12 (gm/cc)

G = -363788.99 (J)  H = -293355.47 (J)  S = 55.32 (J/K)  V = 7.93 (cc)  Cp = 29.27 (J/K)

Viscosity of the System: 6.79 (log 10 poise)

System  mass = 99.96 (gm)  density = 2.60 (gm/cc)
G = -1589080.91 (J)  H = -1275437.15 (J)  S = 246.35 (J/K)  V = 38.38 (cc)  Cp = 130.31 (J/K)

Oxygen  delta moles = -0.00138829  delta grams = -0.0444238
G = 400.66 (J)  H = -44.93 (J)  S = -0.35 (J/K)  V = -146.96 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 990.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = 0.16  COH = 1.82  IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid  mass = 72.71 (gm)  density = 2.47 (gm/cc)  viscosity = 6.44 (log 10 poise)  (analysis in wt %)
G = -1184352.16 (J)  H = -951910.02 (J)  S = 184.02 (J/K)  V = 29.48 (cc)  Cp = 97.58 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.94 | 1.07 | 18.66 | 0.47 | 0.00 | 2.13 | 0.08 | 0.39 | 0.00 | 0.00 | 1.28 | 2.28 | 5.19 | 0.12 | 1.38 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 16.28 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.92Mg0.93Fe'"0.04Ti0.00Al0.21Si1.87O6
G = -220078.66 (J)  H = -175661.94 (J)  S = 35.16 (J/K)  V = 4.61 (cc)  Cp = 18.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.06 | 98.08 | 92.09 | 8.75 | -8.23 | 12.08 | 0.31 |

feldspar  mass = 10.96 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -182137.21 (J)  H = -149773.63 (J)  S = 25.62 (J/K)  V = 4.22 (cc)  Cp = 13.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.64 | 23.37 | 7.99 |

Total solids  mass = 27.24 (gm)  density = 3.08 (gm/cc)
G = -402215.86 (J)  H = -325435.58 (J)  S = 60.78 (J/K)  V = 8.83 (cc)  Cp = 32.23 (J/K)

Viscosity of the System: 6.98 (log 10 poise)

System  mass = 99.95 (gm)  density = 2.61 (gm/cc)
G = -1586568.02 (J)  H = -1277345.60 (J)  S = 244.80 (J/K)  V = 38.31 (cc)  Cp = 129.81 (J/K)

Oxygen  delta moles = -0.00149443  delta grams = -0.0478201
G = 427.53 (J)  H = -47.83 (J)  S = -0.38 (J/K)  V = -156.95 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 980.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -10.53  delta HM = -4.98  NNO = 0.00  QFM = 0.15  COH = 1.80  IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 70.42 (gm) density = 2.46 (gm/cc) viscosity = 6.56 (log 10 poise) (analysis in wt %)
G = -1146623.68 (J) H = -924136.55 (J) S = 177.54 (J/K) V = 28.59 (cc) Cp = 94.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.19 | 1.11 | 18.64 | 0.44 | 0.00 | 1.96 | 0.09 | 0.36 | 0.00 | 0.00 | 1.22 | 2.14 | 5.31 | 0.13 | 1.43 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 16.73 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.93Mg0.92Fe'"0.04Ti0.00Al0.21Si1.87O6
G = -225173.66 (J) H = -180114.27 (J) S = 35.96 (J/K) V = 4.73 (cc) Cp = 19.29 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -104.63 | 98.18 | 93.47 | 8.90 | -8.37 | 12.16 | 0.30 |

feldspar mass = 12.80 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -212276.19 (J) H = -174940.69 (J) S = 29.79 (J/K) V = 4.93 (cc) Cp = 15.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.88 | 22.74 | 8.38 |

Total solids mass = 29.53 (gm) density = 3.06 (gm/cc)
G = -437449.84 (J) H = -355054.96 (J) S = 65.75 (J/K) V = 9.66 (cc) Cp = 34.94 (J/K)

Viscosity of the System: 7.17 (log 10 poise)

System mass = 99.95 (gm) density = 2.61 (gm/cc)
G = -1584073.53 (J) H = -1279191.50 (J) S = 243.29 (J/K) V = 38.25 (cc) Cp = 129.34 (J/K)

Oxygen delta moles = -0.00159496 delta grams = -0.0510369
G = 452.27 (J) H = -50.48 (J) S = -0.40 (J/K) V = -166.18 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 970.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.15 COH = 1.77 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 68.31 (gm) density = 2.46 (gm/cc) viscosity = 6.68 (log 10 poise) (analysis in wt %)
G = -1111889.70 (J) H = -898606.12 (J) S = 171.57 (J/K) V = 27.76 (cc) Cp = 91.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.42 | 1.14 | 18.62 | 0.41 | 0.00 | 1.81 | 0.09 | 0.33 | 0.00 | 0.00 | 1.16 | 2.00 | 5.42 | 0.13 | 1.47 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.14 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.95Mg0.91Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -229687.90 (J) H = -184133.42 (J) S = 36.64 (J/K) V = 4.84 (cc) Cp = 19.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.02 | 98.28 | 94.69 | 9.05 | -8.52 | 12.24 | 0.29 |

feldspar mass = 14.49 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -240019.43 (J) H = -198240.28 (J) S = 33.61 (J/K) V = 5.58 (cc) Cp = 17.71 (J/K)
albite anorthite sanidine
69.04 22.19 8.77

Total solids mass = 31.63 (gm) density = 3.04 (gm/cc)
G = -469707.33 (J) H = -382373.69 (J) S = 70.25 (J/K) V = 10.42 (cc) Cp = 37.43 (J/K)

Viscosity of the System: 7.36 (log 10 poise)

System mass = 99.95 (gm) density = 2.62 (gm/cc)
G = -1581597.03 (J) H = -1280979.81 (J) S = 241.82 (J/K) V = 38.18 (cc) Cp = 128.91 (J/K)

Oxygen delta moles = -0.00168989 delta grams = -0.0540745
G = 474.94 (J) H = -52.88 (J) S = -0.42 (J/K) V = -174.67 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 960.00 (C) P = 6.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.14 COH = 1.75 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 66.38 (gm) density = 2.46 (gm/cc) viscosity = 6.79 (log 10 poise) (analysis in wt %)
G = -1079922.44 (J) H = -875153.56 (J) S = 166.05 (J/K) V = 27.00 (cc) Cp = 88.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.64 | 1.17 | 18.59 | 0.37 | 0.00 | 1.66 | 0.09 | 0.31 | 0.00 | 0.00 | 1.12 | 1.87 | 5.52 | 0.14 | 1.52 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.51 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.96Mg0.90Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -233679.19 (J) H = -187761.80 (J) S = 37.24 (J/K) V = 4.93 (cc) Cp = 20.11 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-107.26 98.37 95.77 9.20 -8.66 12.30 0.28

feldspar mass = 16.06 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -265536.48 (J) H = -219800.11 (J) S = 37.09 (J/K) V = 6.19 (cc) Cp = 19.60 (J/K)
albite anorthite sanidine
69.14 21.70 9.15

Total solids mass = 33.57 (gm) density = 3.02 (gm/cc)
G = -499215.67 (J) H = -407561.91 (J) S = 74.32 (J/K) V = 11.12 (cc) Cp = 39.71 (J/K)

Viscosity of the System: 7.55 (log 10 poise)

System mass = 99.94 (gm) density = 2.62 (gm/cc)
G = -1579138.10 (J) H = -1282715.47 (J) S = 240.38 (J/K) V = 38.12 (cc) Cp = 128.51 (J/K)

Oxygen delta moles = -0.00177934 delta grams = -0.0569368
G = 495.61 (J) H = -55.04 (J) S = -0.45 (J/K) V = -182.43 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 950.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = 0.13  COH = 1.72  IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 64.50 (gm)  density = 2.45 (gm/cc)  viscosity = 6.93 (log 10 poise)  (analysis in wt %)
G = -1049282.83 (J)  H = -852696.48 (J)  S = 160.72 (J/K)  V = 26.28 (cc)  Cp = 86.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.95 | 1.12 | 18.58 | 0.34 | 0.00 | 1.50 | 0.09 | 0.29 | 0.00 | 0.00 | 1.07 | 1.74 | 5.62 | 0.14 | 1.56 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 17.74 (gm)  density = 3.55 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.96Mg0.89Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -236140.71 (J)  H = -190207.07 (J)  S = 37.55 (J/K)  V = 4.99 (cc)  Cp = 20.35 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.02 | 98.44 | 96.48 | 9.31 | -8.80 | 12.31 | 0.27 |

feldspar  mass = 17.57 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -289995.24 (J)  H = -240576.40 (J)  S = 40.40 (J/K)  V = 6.77 (cc)  Cp = 21.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.12 | 21.29 | 9.60 |

rhm-oxide  mass = 0.13 (gm)  density = 4.58 (gm/cc)  (analysis in mole %)
Mn0.01Fe"0.69Mg0.11Fe'"0.19Al0.19Ti0.81O3
G = -1290.67 (J)  H = -987.94 (J)  S = 0.25 (J/K)  V = 0.03 (cc)  Cp = 0.12 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.96 | 9.44 | 68.64 | 1.32 | 9.63 |

Total solids  mass = 35.44 (gm)  density = 3.01 (gm/cc)
G = -527426.61 (J)  H = -431771.42 (J)  S = 78.20 (J/K)  V = 11.79 (cc)  Cp = 41.90 (J/K)

Viscosity of the System: 7.77 (log 10 poise)

System  mass = 99.94 (gm)  density = 2.63 (gm/cc)
G = -1576709.45 (J)  H = -1284467.89 (J)  S = 238.93 (J/K)  V = 38.07 (cc)  Cp = 128.09 (J/K)

Oxygen  delta moles = -0.00183943  delta grams = -0.0588595
G = 507.74 (J)  H = -56.24 (J)  S = -0.46 (J/K)  V = -187.06 (cc)  Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 940.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -11.19  delta HM = -5.01  NNO = 0.00  QFM = 0.12  COH = 1.70  IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid  mass = 62.80 (gm)  density = 2.45 (gm/cc)  viscosity = 7.06 (log 10 poise)  (analysis in wt %)
G = -1021333.31 (J)  H = -832266.67 (J)  S = 155.85 (J/K)  V = 25.62 (cc)  Cp = 83.83 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.22 1.08 18.56 0.31 0.00 1.36 0.09 0.27 0.00 0.00 1.03 1.61 5.72 0.14 1.60 0.00 0.00 0.00 0.00

orthopyroxene mass = 17.96 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.97Mg0.89Fe'"0.03Ti0.00Al0.22Si1.87O6
G = -238369.46 (J) H = -192479.80 (J) S = 37.83 (J/K) V = 5.05 (cc) Cp = 20.58 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-108.73 98.51 97.12 9.43 -8.93 12.33 0.26

feldspar mass = 18.95 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -312293.18 (J) H = -259647.42 (J) S = 43.40 (J/K) V = 7.30 (cc) Cp = 23.08 (J/K)
albite anorthite sanidine
69.05 20.92 10.04

rhm-oxide mass = 0.22 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.69Mg0.11Fe'"0.18Al0.19Ti0.81O3
G = -2298.45 (J) H = -1765.29 (J) S = 0.44 (J/K) V = 0.05 (cc) Cp = 0.22 (J/K)
geikielite hematite ilmenite pyrophanite corundum
10.86 9.12 69.10 1.39 9.53

Total solids mass = 37.13 (gm) density = 2.99 (gm/cc)
G = -552961.09 (J) H = -453892.51 (J) S = 81.66 (J/K) V = 12.40 (cc) Cp = 43.88 (J/K)

Viscosity of the System: 7.97 (log 10 poise)

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1574294.41 (J) H = -1286159.18 (J) S = 237.51 (J/K) V = 38.02 (cc) Cp = 127.71 (J/K)

Oxygen delta moles = -0.00190089 delta grams = -0.0608262
G = 519.94 (J) H = -57.44 (J) S = -0.48 (J/K) V = -191.73 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 930.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.12 COH = 1.67 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 61.25 (gm) density = 2.45 (gm/cc) viscosity = 7.18 (log 10 poise) (analysis in wt %)
G = -995627.37 (J) H = -813529.08 (J) S = 151.35 (J/K) V = 25.01 (cc) Cp = 81.67 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.49 1.04 18.54 0.29 0.00 1.23 0.09 0.25 0.00 0.00 0.99 1.49 5.80 0.15 1.64 0.00 0.00 0.00 0.00

orthopyroxene mass = 18.15 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.98Mg0.88Fe'"0.03Ti0.00Al0.22Si1.87O6
G = -240276.23 (J) H = -194508.27 (J) S = 38.04 (J/K) V = 5.10 (cc) Cp = 20.77 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-109.35 98.58 97.68 9.55 -9.07 12.35 0.25

feldspar mass = 20.23 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -332778.46 (J) H = -277291.34 (J) S = 46.12 (J/K) V = 7.80 (cc) Cp = 24.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.93 | 20.59 | 10.48 |

rhm-oxide mass = 0.31 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.01Fe"0.70Mg0.11Fe'"0.18Al0.19Ti0.82O3
G = -3212.45 (J) H = -2475.60 (J) S = 0.61 (J/K) V = 0.07 (cc) Cp = 0.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.77 | 8.80 | 69.54 | 1.46 | 9.43 |

Total solids mass = 38.69 (gm) density = 2.99 (gm/cc)
G = -576267.15 (J) H = -474275.21 (J) S = 84.77 (J/K) V = 12.96 (cc) Cp = 45.69 (J/K)

Viscosity of the System: 8.18 (log 10 poise)

System mass = 99.94 (gm) density = 2.63 (gm/cc)
G = -1571894.52 (J) H = -1287804.29 (J) S = 236.12 (J/K) V = 37.97 (cc) Cp = 127.36 (J/K)

Oxygen delta moles = -0.00196031 delta grams = -0.0627276
G = 531.29 (J) H = -58.54 (J) S = -0.49 (J/K) V = -196.10 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 920.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.11 COH = 1.65 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 59.51 (gm) density = 2.45 (gm/cc) viscosity = 7.30 (log 10 poise) (analysis in wt %)
G = -966911.07 (J) H = -792134.39 (J) S = 146.48 (J/K) V = 24.32 (cc) Cp = 79.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.64 | 1.00 | 18.58 | 0.26 | 0.00 | 1.12 | 0.10 | 0.24 | 0.00 | 0.00 | 0.95 | 1.38 | 5.90 | 0.15 | 1.69 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 18.32 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.98Mg0.88Fe'"0.03Ti0.00Al0.22Si1.87O6
G = -241969.82 (J) H = -196381.25 (J) S = 38.21 (J/K) V = 5.14 (cc) Cp = 20.94 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -109.90 | 98.65 | 98.12 | 9.72 | -9.26 | 12.43 | 0.25 |

feldspar mass = 21.48 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.11Na0.69Ca0.20Al1.20Si2.80O8
G = -352758.73 (J) H = -294589.49 (J) S = 48.75 (J/K) V = 8.28 (cc) Cp = 26.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.70 | 20.31 | 10.99 |

quartz mass = 0.23 (gm) density = 2.55 (gm/cc)
SiO2
G = -3737.25 (J) H = -3159.22 (J) S = 0.48 (J/K) V = 0.09 (cc) Cp = 0.27 (J/K)

rhm-oxide mass = 0.41 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.11Fe'"0.17Al0.19Ti0.82O3
G = -4134.69 (J) H = -3197.07 (J) S = 0.79 (J/K) V = 0.09 (cc) Cp = 0.39 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.69 | 8.51 | 69.89 | 1.52 | 9.38 |

Total solids mass = 40.43 (gm) density = 2.97 (gm/cc)
G = -602600.50 (J) H = -497327.03 (J) S = 88.23 (J/K) V = 13.59 (cc) Cp = 47.71 (J/K)

Viscosity of the System: 8.39 (log 10 poise)

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1569511.56 (J) H = -1289461.43 (J) S = 234.71 (J/K) V = 37.92 (cc) Cp = 127.00 (J/K)

Oxygen delta moles = -0.00201396 delta grams = -0.0644443
G = 540.79 (J) H = -59.42 (J) S = -0.50 (J/K) V = -199.79 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 910.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.10 COH = 1.62 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 56.41 (gm) density = 2.44 (gm/cc) viscosity = 7.33 (log 10 poise) (analysis in wt %)
G = -915886.02 (J) H = -751959.07 (J) S = 138.55 (J/K) V = 23.09 (cc) Cp = 75.16 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.59 | 0.96 | 18.62 | 0.24 | 0.00 | 1.00 | 0.10 | 0.23 | 0.00 | 0.00 | 0.92 | 1.31 | 6.09 | 0.16 | 1.78 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.71 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.61Mg0.33)3Al2Si3O12
G = -23268.84 (J) H = -19189.46 (J) S = 3.45 (J/K) V = 0.43 (cc) Cp = 1.87 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.65 | 6.26 | 33.10 |

orthopyroxene mass = 17.16 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.97Mg0.89Fe'"0.03Ti0.00Al0.22Si1.87O6
G = -226892.25 (J) H = -184712.43 (J) S = 35.65 (J/K) V = 4.82 (cc) Cp = 19.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.84 | 98.67 | 97.25 | 9.69 | -9.24 | 12.22 | 0.24 |

feldspar mass = 22.66 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.12Na0.68Ca0.20Al1.20Si2.80O8
G = -371463.40 (J) H = -310863.15 (J) S = 51.22 (J/K) V = 8.74 (cc) Cp = 27.52 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.30 | 19.50 | 12.20 |

quartz mass = 1.47 (gm) density = 2.55 (gm/cc)
SiO2
G = -24296.82 (J) H = -20582.87 (J) S = 3.14 (J/K) V = 0.58 (cc) Cp = 1.74 (J/K)

rhm-oxide mass = 0.52 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.11Fe'"0.16Al0.19Ti0.83O3
G = -5305.84 (J) H = -4117.08 (J) S = 1.00 (J/K) V = 0.11 (cc) Cp = 0.50 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 10.86 | 8.21 | 70.03 | 1.64 | 9.26 |

Total solids mass = 43.52 (gm) density = 2.96 (gm/cc)
G = -651227.16 (J) H = -539464.99 (J) S = 94.46 (J/K) V = 14.68 (cc) Cp = 51.26 (J/K)

Viscosity of the System: 8.64 (log 10 poise)

System mass = 99.93 (gm) density = 2.65 (gm/cc)
G = -1567113.19 (J) H = -1291424.06 (J) S = 233.01 (J/K) V = 37.77 (cc) Cp = 126.41 (J/K)

Oxygen delta moles = -0.00212549 delta grams = -0.0680131
G = 565.44 (J) H = -61.96 (J) S = -0.53 (J/K) V = -209.09 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 900.00 (C) P = 6.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = 0.09 COH = 1.60 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 53.02 (gm) density = 2.44 (gm/cc) viscosity = 7.34 (log 10 poise) (analysis in wt %)
G = -860189.99 (J) H = -707628.47 (J) S = 130.04 (J/K) V = 21.75 (cc) Cp = 70.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.61 | 0.93 | 18.51 | 0.21 | 0.00 | 0.88 | 0.10 | 0.22 | 0.00 | 0.00 | 0.90 | 1.26 | 6.30 | 0.17 | 1.90 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.56 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.60Mg0.34)3Al2Si3O12
G = -62186.19 (J) H = -51423.27 (J) S = 9.17 (J/K) V = 1.16 (cc) Cp = 5.00 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 60.11 | 6.29 | 33.60 |

orthopyroxene mass = 15.10 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.95Mg0.91Fe'"0.03Ti0.00Al0.21Si1.88O6
G = -200267.73 (J) H = -163602.39 (J) S = 31.25 (J/K) V = 4.25 (cc) Cp = 17.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.36 | 98.65 | 95.39 | 9.35 | -8.91 | 11.63 | 0.25 |

feldspar mass = 23.72 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.14Na0.68Ca0.18Al1.18Si2.82O8
G = -387850.72 (J) H = -325233.97 (J) S = 53.37 (J/K) V = 9.16 (cc) Cp = 28.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.72 | 18.24 | 14.03 |

quartz mass = 2.90 (gm) density = 2.55 (gm/cc)
SiO2
G = -47797.82 (J) H = -40577.99 (J) S = 6.15 (J/K) V = 1.14 (cc) Cp = 3.42 (J/K)

rhm-oxide mass = 0.63 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.11Fe'"0.16Al0.18Ti0.83O3
G = -6420.54 (J) H = -4999.96 (J) S = 1.21 (J/K) V = 0.14 (cc) Cp = 0.61 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.24 | 7.86 | 70.13 | 1.78 | 8.98 |

Total solids mass = 46.91 (gm) density = 2.96 (gm/cc)
G = -704523.01 (J) H = -585837.58 (J) S = 101.17 (J/K) V = 15.84 (cc) Cp = 55.08 (J/K)

Viscosity of the System: 8.95 (log 10 poise)

System mass = 99.93 (gm) density = 2.66 (gm/cc)
G = -1564713.00 (J) H = -1293466.05 (J) S = 231.21 (J/K) V = 37.58 (cc) Cp = 125.72 (J/K)

Oxygen delta moles = -0.00227437 delta grams = -0.072777
G = 599.37 (J) H = -65.49 (J) S = -0.57 (J/K) V = -221.84 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 890.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = 0.08 COH = 1.57 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 49.70 (gm) density = 2.43 (gm/cc) viscosity = 7.34 (log 10 poise) (analysis in wt %)
G = -805656.96 (J) H = -664032.25 (J) S = 121.76 (J/K) V = 20.42 (cc) Cp = 66.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.61 | 0.90 | 18.40 | 0.19 | 0.00 | 0.78 | 0.11 | 0.22 | 0.00 | 0.00 | 0.89 | 1.23 | 6.46 | 0.18 | 2.03 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 7.21 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.59Mg0.34)3Al2Si3O12
G = -98475.48 (J) H = -81655.03 (J) S = 14.46 (J/K) V = 1.83 (cc) Cp = 7.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.50 | 6.37 | 34.14 |

orthopyroxene mass = 13.17 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.93Mg0.94Fe'"0.02Ti0.00Al0.20Si1.89O6
G = -175308.27 (J) H = -143715.06 (J) S = 27.16 (J/K) V = 3.71 (cc) Cp = 15.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -103.65 | 98.62 | 93.33 | 9.00 | -8.57 | 11.03 | 0.25 |

feldspar mass = 24.86 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.67Ca0.17Al1.17Si2.83O8
G = -405413.62 (J) H = -340643.71 (J) S = 55.68 (J/K) V = 9.61 (cc) Cp = 30.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.76 | 16.94 | 16.29 |

quartz mass = 4.26 (gm) density = 2.55 (gm/cc)
SiO2
G = -70031.85 (J) H = -59580.13 (J) S = 8.99 (J/K) V = 1.67 (cc) Cp = 5.01 (J/K)

rhm-oxide mass = 0.73 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.15Al0.17Ti0.84O3
G = -7455.32 (J) H = -5826.83 (J) S = 1.40 (J/K) V = 0.16 (cc) Cp = 0.70 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 11.65 | 7.51 | 70.18 | 1.93 | 8.73 |

Total solids mass = 50.22 (gm) density = 2.96 (gm/cc)
G = -756684.54 (J) H = -631420.76 (J) S = 107.69 (J/K) V = 16.98 (cc) Cp = 58.83 (J/K)

Viscosity of the System: 9.42 (log 10 poise)

System mass = 99.92 (gm) density = 2.67 (gm/cc)
G = -1562341.50 (J) H = -1295453.01 (J) S = 229.45 (J/K) V = 37.40 (cc) Cp = 125.04 (J/K)

Oxygen delta moles = -0.00240289 delta grams = -0.0768895
G = 627.26 (J) H = -68.33 (J) S = -0.60 (J/K) V = -232.38 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 880.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = 0.07 COH = 1.54 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 45.23 (gm) density = 2.43 (gm/cc) viscosity = 7.29 (log 10 poise) (analysis in wt %)
G = -733251.44 (J) H = -605291.93 (J) S = 110.97 (J/K) V = 18.64 (cc) Cp = 60.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.62 | 0.85 | 18.29 | 0.18 | 0.00 | 0.70 | 0.11 | 0.22 | 0.00 | 0.00 | 0.91 | 1.26 | 6.43 | 0.20 | 2.22 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 10.10 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.59Mg0.35)3Al2Si3O12
G = -138178.49 (J) H = -114903.45 (J) S = 20.18 (J/K) V = 2.57 (cc) Cp = 11.10 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.61 | 6.45 | 34.94 |

orthopyroxene mass = 11.02 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.91Mg0.97Fe'"0.02Ti0.00Al0.19Si1.89O6
G = -147582.92 (J) H = -121440.33 (J) S = 22.67 (J/K) V = 3.12 (cc) Cp = 12.68 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.19 | 98.57 | 90.54 | 8.64 | -8.21 | 10.40 | 0.25 |

feldspar mass = 22.82 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.67Ca0.17Al1.17Si2.83O8
G = -371813.99 (J) H = -313131.83 (J) S = 50.89 (J/K) V = 8.82 (cc) Cp = 27.62 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.16 | 17.13 | 15.72 |

feldspar mass = 4.03 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.55Na0.41Ca0.04Al1.04Si2.96O8
G = -64324.31 (J) H = -54071.19 (J) S = 8.89 (J/K) V = 1.59 (cc) Cp = 4.80 (J/K)

albite anorthite sanidine
41.08 3.71 55.21

quartz mass = 5.85 (gm) density = 2.55 (gm/cc)
SiO2
G = -96087.29 (J) H = -81920.50 (J) S = 12.29 (J/K) V = 2.29 (cc) Cp = 6.87 (J/K)

rhm-oxide mass = 0.86 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.14Al0.17Ti0.84O3
G = -8755.49 (J) H = -6869.28 (J) S = 1.64 (J/K) V = 0.19 (cc) Cp = 0.82 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.21 7.10 70.09 2.08 8.52

Total solids mass = 54.69 (gm) density = 2.94 (gm/cc)
G = -826742.49 (J) H = -692336.59 (J) S = 116.56 (J/K) V = 18.57 (cc) Cp = 63.89 (J/K)

Viscosity of the System: 12.81 (log 10 poise)

System mass = 99.92 (gm) density = 2.69 (gm/cc)
G = -1559993.93 (J) H = -1297628.51 (J) S = 227.52 (J/K) V = 37.21 (cc) Cp = 124.21 (J/K)

Oxygen delta moles = -0.00252125 delta grams = -0.0806769
G = 651.88 (J) H = -70.81 (J) S = -0.63 (J/K) V = -241.73 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 870.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = 0.07 COH = 1.51 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 41.26 (gm) density = 2.42 (gm/cc) viscosity = 7.22 (log 10 poise) (analysis in wt %)
G = -668861.13 (J) H = -552959.67 (J) S = 101.39 (J/K) V = 17.04 (cc) Cp = 55.08 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.62 0.81 18.19 0.16 0.00 0.63 0.12 0.23 0.00 0.00 0.92 1.29 6.37 0.22 2.44 0.00 0.00 0.00 0.00

garnet mass = 12.58 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.58Mg0.36)3Al2Si3O12
G = -172265.89 (J) H = -143653.56 (J) S = 25.03 (J/K) V = 3.20 (cc) Cp = 13.82 (J/K)
almandine grossular pyrope
57.76 6.52 35.72

orthopyroxene mass = 9.19 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.88Mg1.00Fe'"0.02Ti0.00Al0.18Si1.90O6
G = -123735.96 (J) H = -102193.66 (J) S = 18.84 (J/K) V = 2.61 (cc) Cp = 10.60 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-96.80 98.53 87.78 8.29 -7.86 9.80 0.26

feldspar mass = 21.10 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.15Na0.68Ca0.17Al1.17Si2.83O8
G = -343400.55 (J) H = -289871.72 (J) S = 46.83 (J/K) V = 8.15 (cc) Cp = 25.52 (J/K)

albite anorthite sanidine
67.66 17.38 14.96

feldspar mass = 7.56 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.56Na0.40Ca0.03Al1.03Si2.97O8
G = -120356.28 (J) H = -101401.49 (J) S = 16.58 (J/K) V = 2.98 (cc) Cp = 9.00 (J/K)
albite anorthite sanidine
40.10 3.44 56.46

quartz mass = 7.26 (gm) density = 2.55 (gm/cc)
SiO2
G = -119189.36 (J) H = -101831.55 (J) S = 15.18 (J/K) V = 2.84 (cc) Cp = 8.53 (J/K)

rhm-oxide mass = 0.97 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.13Fe"'0.13Al0.17Ti0.85O3
G = -9868.99 (J) H = -7772.26 (J) S = 1.83 (J/K) V = 0.21 (cc) Cp = 0.92 (J/K)
geikielite hematite ilmenite pyrophanite corundum
12.76 6.73 69.97 2.23 8.32

Total solids mass = 58.66 (gm) density = 2.93 (gm/cc)
G = -888817.02 (J) H = -746724.24 (J) S = 124.30 (J/K) V = 19.99 (cc) Cp = 68.38 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.70 (gm/cc)
G = -1557678.16 (J) H = -1299683.91 (J) S = 225.69 (J/K) V = 37.03 (cc) Cp = 123.47 (J/K)

Oxygen delta moles = -0.00261539 delta grams = -0.0836893
G = 669.73 (J) H = -72.52 (J) S = -0.65 (J/K) V = -248.58 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 860.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = 0.06 COH = 1.48 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 37.77 (gm) density = 2.41 (gm/cc) viscosity = 7.14 (log 10 poise) (analysis in wt %)
G = -612366.38 (J) H = -506985.53 (J) S = 93.00 (J/K) V = 15.64 (cc) Cp = 50.49 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.59 0.76 18.10 0.15 0.00 0.57 0.13 0.23 0.00 0.00 0.94 1.33 6.31 0.24 2.66 0.00 0.00 0.00 0.00

garnet mass = 14.68 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.57Mg0.36)3Al2Si3O12
G = -201420.21 (J) H = -168433.64 (J) S = 29.11 (J/K) V = 3.74 (cc) Cp = 16.14 (J/K)
almandine grossular pyrope
56.95 6.58 36.47

orthopyroxene mass = 7.63 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.85Mg1.04Fe"'0.02Ti0.00Al0.17Si1.90O6
G = -103317.62 (J) H = -85639.02 (J) S = 15.60 (J/K) V = 2.18 (cc) Cp = 8.82 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-93.53 98.49 85.10 7.95 -7.53 9.26 0.27

feldspar mass = 19.80 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.14Na0.68Ca0.18Al1.18Si2.82O8
G = -321897.82 (J) H = -272345.38 (J) S = 43.73 (J/K) V = 7.64 (cc) Cp = 23.94 (J/K)
albite anorthite sanidine
68.14 17.58 14.28

feldspar mass = 10.45 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.58Na0.39Ca0.03Al1.03Si2.97O8
G = -166045.78 (J) H = -140212.60 (J) S = 22.80 (J/K) V = 4.12 (cc) Cp = 12.42 (J/K)
albite anorthite sanidine
39.17 3.19 57.64

quartz mass = 8.51 (gm) density = 2.55 (gm/cc)
SiO2
G = -139536.16 (J) H = -119466.77 (J) S = 17.71 (J/K) V = 3.33 (cc) Cp = 9.98 (J/K)

rhm-oxide mass = 1.06 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.13Fe'"0.13Al0.16Ti0.85O3
G = -10806.26 (J) H = -8542.15 (J) S = 2.00 (J/K) V = 0.23 (cc) Cp = 1.01 (J/K)
geikielite hematite ilmenite pyrophanite corundum
13.30 6.37 69.83 2.37 8.14

Total solids mass = 62.14 (gm) density = 2.93 (gm/cc)
G = -943023.85 (J) H = -794639.56 (J) S = 130.95 (J/K) V = 21.24 (cc) Cp = 72.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.71 (gm/cc)
G = -1555390.23 (J) H = -1301625.09 (J) S = 223.95 (J/K) V = 36.88 (cc) Cp = 122.81 (J/K)

Oxygen delta moles = -0.00269074 delta grams = -0.0861003
G = 682.34 (J) H = -73.66 (J) S = -0.67 (J/K) V = -253.50 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 850.00 (C) P = 6.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = 0.05 COH = 1.46 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 34.68 (gm) density = 2.41 (gm/cc) viscosity = 7.06 (log 10 poise) (analysis in wt %)
G = -562287.27 (J) H = -466174.55 (J) S = 85.57 (J/K) V = 14.40 (cc) Cp = 46.42 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.54 0.71 18.00 0.13 0.00 0.51 0.13 0.23 0.00 0.00 0.96 1.38 6.24 0.26 2.90 0.00 0.00 0.00 0.00

garnet mass = 16.50 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.56Mg0.37)3Al2Si3O12
G = -226613.31 (J) H = -190022.58 (J) S = 32.58 (J/K) V = 4.21 (cc) Cp = 18.14 (J/K)

almandine grossular pyrope
56.18 6.63 37.19

orthopyroxene mass = 6.30 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.82Mg1.07Fe'"0.02Ti0.00Al0.17Si1.91O6
G = -85651.09 (J) H = -71247.54 (J) S = 12.82 (J/K) V = 1.80 (cc) Cp = 7.29 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-90.37 98.45 82.47 7.63 -7.21 8.75 0.27

feldspar mass = 18.80 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.14Na0.69Ca0.18Al1.18Si2.82O8
G = -305428.25 (J) H = -259001.71 (J) S = 41.34 (J/K) V = 7.25 (cc) Cp = 22.73 (J/K)
albite anorthite sanidine
68.62 17.73 13.64

feldspar mass = 12.86 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.59Na0.38Ca0.03Al1.03Si2.97O8
G = -203899.80 (J) H = -172567.17 (J) S = 27.90 (J/K) V = 5.07 (cc) Cp = 15.27 (J/K)
albite anorthite sanidine
38.28 2.96 58.76

quartz mass = 9.63 (gm) density = 2.55 (gm/cc)
SiO2
G = -157647.17 (J) H = -135256.88 (J) S = 19.94 (J/K) V = 3.77 (cc) Cp = 11.28 (J/K)

rhm-oxide mass = 1.14 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.14Fe'"0.12Al0.16Ti0.86O3
G = -11599.95 (J) H = -9203.25 (J) S = 2.13 (J/K) V = 0.25 (cc) Cp = 1.08 (J/K)
geikielite hematite ilmenite pyrophanite corundum
13.82 6.05 69.67 2.50 7.96

Total solids mass = 65.23 (gm) density = 2.92 (gm/cc)
G = -990839.58 (J) H = -837299.12 (J) S = 136.71 (J/K) V = 22.35 (cc) Cp = 75.80 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.72 (gm/cc)
G = -1553126.86 (J) H = -1303473.67 (J) S = 222.28 (J/K) V = 36.75 (cc) Cp = 122.22 (J/K)

Oxygen delta moles = -0.00275191 delta grams = -0.0880578
G = 691.04 (J) H = -74.36 (J) S = -0.68 (J/K) V = -256.98 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 840.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = 0.04 COH = 1.43 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 31.92 (gm) density = 2.40 (gm/cc) viscosity = 6.97 (log 10 poise) (analysis in wt %)
G = -517482.89 (J) H = -429605.14 (J) S = 78.95 (J/K) V = 13.29 (cc) Cp = 42.78 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

68.46 0.67 17.92 0.12 0.00 0.46 0.14 0.23 0.00 0.00 0.97 1.42 6.17 0.28 3.15 0.00 0.00 0.00 0.00

garnet mass = 18.08 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.55Mg0.38)3Al2Si3O12
G = -248585.96 (J) H = -209014.67 (J) S = 35.55 (J/K) V = 4.62 (cc) Cp = 19.88 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.45 | 6.68 | 37.87 |

orthopyroxene mass = 5.14 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.80Mg1.10Fe'"0.01Ti0.00Al0.16Si1.91O6
G = -70220.50 (J) H = -58615.56 (J) S = 10.43 (J/K) V = 1.47 (cc) Cp = 5.96 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.32 | 98.42 | 79.91 | 7.33 | -6.90 | 8.28 | 0.28 |

feldspar mass = 18.04 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.13Na0.69Ca0.18Al1.18Si2.82O8
G = -292719.11 (J) H = -248788.74 (J) S = 39.46 (J/K) V = 6.95 (cc) Cp = 21.81 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.10 | 17.85 | 13.05 |

feldspar mass = 14.90 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.60Na0.37Ca0.03Al1.03Si2.97O8
G = -235677.40 (J) H = -199912.48 (J) S = 32.13 (J/K) V = 5.87 (cc) Cp = 17.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.43 | 2.74 | 59.83 |

quartz mass = 10.64 (gm) density = 2.55 (gm/cc)
SiO2
G = -173924.51 (J) H = -149535.40 (J) S = 21.91 (J/K) V = 4.17 (cc) Cp = 12.45 (J/K)

rhm-oxide mass = 1.20 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.14Fe'"0.11Al0.16Ti0.86O3
G = -12275.23 (J) H = -9774.32 (J) S = 2.25 (J/K) V = 0.26 (cc) Cp = 1.14 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.34 | 5.74 | 69.50 | 2.62 | 7.79 |

Total solids mass = 67.99 (gm) density = 2.91 (gm/cc)
G = -1033402.72 (J) H = -875641.17 (J) S = 141.73 (J/K) V = 23.34 (cc) Cp = 78.90 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.73 (gm/cc)
G = -1550885.60 (J) H = -1305246.32 (J) S = 220.67 (J/K) V = 36.63 (cc) Cp = 121.69 (J/K)

Oxygen delta moles = -0.00280226 delta grams = -0.089669
G = 696.75 (J) H = -74.73 (J) S = -0.69 (J/K) V = -259.35 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 830.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = 0.03 COH = 1.40 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 29.43 (gm) density = 2.40 (gm/cc) viscosity = 6.86 (log 10 poise) (analysis in wt %)
G = -477056.28 (J) H = -396552.36 (J) S = 72.98 (J/K) V = 12.28 (cc) Cp = 39.50 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.35 | 0.63 | 17.83 | 0.11 | 0.00 | 0.42 | 0.15 | 0.23 | 0.00 | 0.00 | 0.99 | 1.47 | 6.08 | 0.31 | 3.42 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 19.46 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.55Mg0.39)3Al2Si3O12
G = -267913.27 (J) H = -225871.85 (J) S = 38.11 (J/K) V = 4.98 (cc) Cp = 21.41 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.75 | 6.72 | 38.53 |

orthopyroxene mass = 4.12 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.77Mg1.13Fe'"0.01Ti0.00Al0.15Si1.92O6
G = -56625.28 (J) H = -47429.19 (J) S = 8.34 (J/K) V = 1.19 (cc) Cp = 4.79 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.35 | 98.39 | 77.41 | 7.04 | -6.61 | 7.84 | 0.28 |

feldspar mass = 17.45 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.70Ca0.18Al1.18Si2.82O8
G = -282878.26 (J) H = -240968.71 (J) S = 37.99 (J/K) V = 6.72 (cc) Cp = 21.10 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.57 | 17.94 | 12.50 |

feldspar mass = 16.63 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.61Na0.37Ca0.03Al1.03Si2.97O8
G = -262653.82 (J) H = -223297.86 (J) S = 35.68 (J/K) V = 6.55 (cc) Cp = 19.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.60 | 2.54 | 60.86 |

quartz mass = 11.56 (gm) density = 2.55 (gm/cc)
SiO2
G = -188685.89 (J) H = -162566.07 (J) S = 23.68 (J/K) V = 4.53 (cc) Cp = 13.51 (J/K)

rhm-oxide mass = 1.26 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.15Fe'"0.11Al0.15Ti0.87O3
G = -12851.83 (J) H = -10270.06 (J) S = 2.34 (J/K) V = 0.28 (cc) Cp = 1.19 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.86 | 5.45 | 69.33 | 2.74 | 7.63 |

Total solids mass = 70.48 (gm) density = 2.91 (gm/cc)
G = -1071608.36 (J) H = -910403.75 (J) S = 146.13 (J/K) V = 24.24 (cc) Cp = 81.70 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.74 (gm/cc)
G = -1548664.64 (J) H = -1306956.11 (J) S = 219.11 (J/K) V = 36.52 (cc) Cp = 121.21 (J/K)

Oxygen delta moles = -0.00284425 delta grams = -0.0910127
G = 700.16 (J) H = -74.85 (J) S = -0.70 (J/K) V = -260.87 (cc) Cp = -0.10 (J/K)

**********_____**********
Title: metapelite

T = 820.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -13.45  delta HM = -5.11  NNO = 0.00  QFM = 0.02  COH = 1.37  IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid  mass = 27.16 (gm)  density = 2.39 (gm/cc)  viscosity = 6.75 (log 10 poise)  (analysis in wt %)
G = -440288.97 (J)  H = -366434.94 (J)  S = 67.56 (J/K)  V = 11.36 (cc)  Cp = 36.52 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.22 | 0.58 | 17.75 | 0.10 | 0.00 | 0.38 | 0.15 | 0.23 | 0.00 | 0.00 | 1.01 | 1.53 | 6.00 | 0.33 | 3.71 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 20.69 (gm)  density = 3.91 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.54Mg0.39)3Al2Si3O12
G = -285049.47 (J)  H = -240959.47 (J)  S = 40.33 (J/K)  V = 5.29 (cc)  Cp = 22.76 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.08 | 6.75 | 39.17 |

orthopyroxene  mass = 3.23 (gm)  density = 3.47 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.75Mg1.15Fe'"0.01Ti0.00Al0.14Si1.92O6
G = -44548.97 (J)  H = -37439.95 (J)  S = 6.50 (J/K)  V = 0.93 (cc)  Cp = 3.76 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.47 | 98.37 | 74.95 | 6.77 | -6.33 | 7.43 | 0.29 |

feldspar  mass = 17.00 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.12Na0.70Ca0.18Al1.18Si2.82O8
G = -275262.87 (J)  H = -235009.64 (J)  S = 36.82 (J/K)  V = 6.55 (cc)  Cp = 20.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.04 | 17.99 | 11.97 |

feldspar  mass = 18.13 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.62Na0.36Ca0.02Al1.02Si2.98O8
G = -285779.32 (J)  H = -243505.48 (J)  S = 38.67 (J/K)  V = 7.14 (cc)  Cp = 21.47 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.78 | 2.36 | 61.86 |

quartz  mass = 12.40 (gm)  density = 2.55 (gm/cc)
SiO2
G = -202187.50 (J)  H = -174561.81 (J)  S = 25.27 (J/K)  V = 4.85 (cc)  Cp = 14.48 (J/K)

rhm-oxide  mass = 1.30 (gm)  density = 4.55 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.69Mg0.15Fe'"0.10Al0.15Ti0.87O3
G = -13345.47 (J)  H = -10702.24 (J)  S = 2.42 (J/K)  V = 0.29 (cc)  Cp = 1.23 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.36 | 5.18 | 69.14 | 2.85 | 7.47 |

Total solids  mass = 72.75 (gm)  density = 2.90 (gm/cc)
G = -1106173.60 (J)  H = -942178.58 (J)  S = 150.02 (J/K)  V = 25.06 (cc)  Cp = 84.25 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.74 (gm/cc)
G = -1546462.57 (J) H = -1308613.53 (J) S = 217.58 (J/K) V = 36.42 (cc) Cp = 120.77 (J/K)

Oxygen delta moles = -0.00287972 delta grams = -0.0921474
G = 701.78 (J) H = -74.77 (J) S = -0.71 (J/K) V = -261.73 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 810.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = 0.01 COH = 1.33 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 25.08 (gm) density = 2.38 (gm/cc) viscosity = 6.62 (log 10 poise) (analysis in wt %)
G = -406594.43 (J) H = -338777.75 (J) S = 62.61 (J/K) V = 10.52 (cc) Cp = 33.79 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.05 | 0.54 | 17.68 | 0.10 | 0.00 | 0.34 | 0.16 | 0.23 | 0.00 | 0.00 | 1.04 | 1.59 | 5.90 | 0.36 | 4.01 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 21.78 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.53Mg0.40)3Al2Si3O12
G = -300359.27 (J) H = -254571.42 (J) S = 42.27 (J/K) V = 5.58 (cc) Cp = 23.96 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.43 | 6.78 | 39.78 |

orthopyroxene mass = 2.43 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.73Mg1.18Fe'"0.01Ti0.00Al0.14Si1.93O6
G = -33737.29 (J) H = -28447.72 (J) S = 4.88 (J/K) V = 0.70 (cc) Cp = 2.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -78.68 | 98.35 | 72.54 | 6.51 | -6.07 | 7.05 | 0.29 |

feldspar mass = 16.65 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.71Ca0.18Al1.18Si2.82O8
G = -269398.80 (J) H = -230518.88 (J) S = 35.90 (J/K) V = 6.41 (cc) Cp = 20.15 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.50 | 18.02 | 11.48 |

feldspar mass = 19.44 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -305779.33 (J) H = -261132.70 (J) S = 41.22 (J/K) V = 7.66 (cc) Cp = 23.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.99 | 2.19 | 62.82 |

quartz mass = 13.18 (gm) density = 2.55 (gm/cc)
SiO2
G = -214640.38 (J) H = -185698.31 (J) S = 26.72 (J/K) V = 5.16 (cc) Cp = 15.37 (J/K)

rhm-oxide mass = 1.35 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.16Fe'"0.10Al0.15Ti0.88O3
G = -13768.84 (J) H = -11080.36 (J) S = 2.48 (J/K) V = 0.30 (cc) Cp = 1.27 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.86 | 4.93 | 68.94 | 2.95 | 7.32 |

Total solids mass = 74.83 (gm) density = 2.90 (gm/cc)
G = -1137683.91 (J) H = -971449.39 (J) S = 153.47 (J/K) V = 25.81 (cc) Cp = 86.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.75 (gm/cc)
G = -1544278.34 (J) H = -1310227.14 (J) S = 216.08 (J/K) V = 36.33 (cc) Cp = 120.37 (J/K)

Oxygen delta moles = -0.00291003 delta grams = -0.0931176
G = 701.99 (J) H = -74.53 (J) S = -0.72 (J/K) V = -262.07 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 800.00 (C) P = 6.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = 0.00 COH = 1.30 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 23.15 (gm) density = 2.38 (gm/cc) viscosity = 6.48 (log 10 poise) (analysis in wt %)
G = -375483.92 (J) H = -313184.01 (J) S = 58.05 (J/K) V = 9.74 (cc) Cp = 31.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.83 | 0.50 | 17.62 | 0.09 | 0.00 | 0.31 | 0.17 | 0.23 | 0.00 | 0.00 | 1.06 | 1.66 | 5.79 | 0.39 | 4.35 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.76 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.53Mg0.40)3Al2Si3O12
G = -314140.66 (J) H = -266948.37 (J) S = 43.98 (J/K) V = 5.84 (cc) Cp = 25.04 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.81 | 6.81 | 40.38 |

orthopyroxene mass = 1.72 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.70Mg1.21Fe'''0.01Ti0.00Al0.13Si1.93O6
G = -23982.28 (J) H = -20288.34 (J) S = 3.44 (J/K) V = 0.50 (cc) Cp = 2.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -75.96 | 98.34 | 70.17 | 6.26 | -5.81 | 6.70 | 0.30 |

feldspar mass = 16.40 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.71Ca0.18Al1.18Si2.82O8
G = -264929.21 (J) H = -227200.68 (J) S = 35.16 (J/K) V = 6.31 (cc) Cp = 19.85 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.96 | 18.03 | 11.00 |

feldspar mass = 20.58 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -323220.12 (J) H = -276646.25 (J) S = 43.40 (J/K) V = 8.11 (cc) Cp = 24.34 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.21 | 2.02 | 63.77 |

quartz mass = 13.91 (gm) density = 2.55 (gm/cc)
SiO2
G = -226222.59 (J) H = -196124.19 (J) S = 28.05 (J/K) V = 5.45 (cc) Cp = 16.20 (J/K)

rhm-oxide mass = 1.38 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.16Fe'"0.09Al0.14Ti0.88O3
G = -14132.36 (J) H = -11412.26 (J) S = 2.53 (J/K) V = 0.30 (cc) Cp = 1.30 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 16.36 | 4.69 | 68.74 | 3.04 | 7.18 |

Total solids mass = 76.75 (gm) density = 2.90 (gm/cc)
G = -1166627.22 (J) H = -998620.09 (J) S = 156.56 (J/K) V = 26.50 (cc) Cp = 88.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.76 (gm/cc)
G = -1542111.14 (J) H = -1311804.10 (J) S = 214.61 (J/K) V = 36.25 (cc) Cp = 120.01 (J/K)

Oxygen delta moles = -0.00293626 delta grams = -0.0939569
G = 701.09 (J) H = -74.17 (J) S = -0.72 (J/K) V = -261.99 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 790.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.01 COH = 1.27 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 20.44 (gm) density = 2.37 (gm/cc) viscosity = 6.38 (log 10 poise) (analysis in wt %)
G = -331488.90 (J) H = -276858.58 (J) S = 51.39 (J/K) V = 8.62 (cc) Cp = 27.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.41 | 0.46 | 17.83 | 0.08 | 0.00 | 0.29 | 0.19 | 0.21 | 0.00 | 0.00 | 1.09 | 1.67 | 5.68 | 0.44 | 4.65 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.72 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.54Mg0.39)3Al2Si3O12
G = -325336.05 (J) H = -276946.49 (J) S = 45.52 (J/K) V = 6.06 (cc) Cp = 25.99 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.19 | 6.78 | 39.04 |

biotite mass = 1.32 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -21243.72 (J) H = -18154.08 (J) S = 2.91 (J/K) V = 0.48 (cc) Cp = 1.68 (J/K)

| annite | phlogopite |
|---|---|
| 1.28 | 98.72 |

feldspar mass = 16.96 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.11Na0.72Ca0.18Al1.18Si2.82O8
G = -273719.89 (J) H = -235258.11 (J) S = 36.18 (J/K) V = 6.52 (cc) Cp = 20.55 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.51 | 17.89 | 10.61 |

feldspar mass = 20.62 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.65Na0.34Ca0.02Al1.02Si2.98O8
G = -323174.59 (J) H = -277225.57 (J) S = 43.22 (J/K) V = 8.12 (cc) Cp = 24.38 (J/K)

albite anorthite sanidine
33.55 1.87 64.58

quartz mass = 15.42 (gm) density = 2.55 (gm/cc)
SiO2
G = -250428.67 (J) H = -217557.97 (J) S = 30.92 (J/K) V = 6.04 (cc) Cp = 17.94 (J/K)

rhm-oxide mass = 1.43 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.16Fe'"0.09Al0.14Ti0.88O3
G = -14571.17 (J) H = -11795.87 (J) S = 2.61 (J/K) V = 0.31 (cc) Cp = 1.34 (J/K)
geikielite hematite ilmenite pyrophanite corundum
15.53 4.56 69.53 3.13 7.25

Total solids mass = 79.47 (gm) density = 2.89 (gm/cc)
G = -1208474.09 (J) H = -1036938.09 (J) S = 161.35 (J/K) V = 27.54 (cc) Cp = 91.88 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.76 (gm/cc)
G = -1539962.99 (J) H = -1313796.67 (J) S = 212.73 (J/K) V = 36.16 (cc) Cp = 119.55 (J/K)

Oxygen delta moles = -0.00296153 delta grams = -0.0947654
G = 699.84 (J) H = -73.77 (J) S = -0.73 (J/K) V = -261.78 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 780.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.02 COH = 1.24 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 19.16 (gm) density = 2.37 (gm/cc) viscosity = 6.33 (log 10 poise) (analysis in wt %)
G = -310815.89 (J) H = -260049.37 (J) S = 48.20 (J/K) V = 8.08 (cc) Cp = 26.00 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.89 0.43 18.31 0.08 0.00 0.26 0.20 0.18 0.00 0.00 1.08 1.61 5.60 0.47 4.89 0.00 0.00 0.00 0.00

garnet mass = 23.42 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.55Mg0.38)3Al2Si3O12
G = -319896.02 (J) H = -272861.23 (J) S = 44.66 (J/K) V = 5.98 (cc) Cp = 25.60 (J/K)
almandine grossular pyrope
54.98 6.68 38.34

biotite mass = 1.62 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -26038.29 (J) H = -22302.08 (J) S = 3.55 (J/K) V = 0.59 (cc) Cp = 2.06 (J/K)
annite phlogopite
1.30 98.70

feldspar mass = 17.56 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.72Ca0.18Al1.18Si2.82O8
G = -283104.50 (J) H = -243874.64 (J) S = 37.25 (J/K) V = 6.75 (cc) Cp = 21.31 (J/K)

albite anorthite sanidine
71.72 18.25 10.03

feldspar mass = 20.78 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -325093.54 (J) H = -279497.70 (J) S = 43.29 (J/K) V = 8.19 (cc) Cp = 24.56 (J/K)
albite anorthite sanidine
32.46 1.73 65.80

quartz mass = 15.91 (gm) density = 2.55 (gm/cc)
SiO2
G = -258112.38 (J) H = -224694.55 (J) S = 31.73 (J/K) V = 6.23 (cc) Cp = 18.49 (J/K)

rhm-oxide mass = 1.45 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.15Fe'"0.09Al0.15Ti0.88O3
G = -14772.56 (J) H = -11995.90 (J) S = 2.64 (J/K) V = 0.32 (cc) Cp = 1.36 (J/K)
geikielite hematite ilmenite pyrophanite corundum
15.07 4.30 69.94 3.18 7.51

Total solids mass = 80.74 (gm) density = 2.88 (gm/cc)
G = -1227017.29 (J) H = -1055226.11 (J) S = 163.12 (J/K) V = 28.05 (cc) Cp = 93.37 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.77 (gm/cc)
G = -1537833.18 (J) H = -1315275.47 (J) S = 211.33 (J/K) V = 36.13 (cc) Cp = 119.38 (J/K)

Oxygen delta moles = -0.00297975 delta grams = -0.0953484
G = 696.83 (J) H = -73.18 (J) S = -0.73 (J/K) V = -260.91 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 770.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.03 COH = 1.20 IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 17.99 (gm) density = 2.37 (gm/cc) viscosity = 6.28 (log 10 poise) (analysis in wt %)
G = -291947.30 (J) H = -244686.13 (J) S = 45.31 (J/K) V = 7.59 (cc) Cp = 24.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.34 | 0.41 | 18.80 | 0.07 | 0.00 | 0.23 | 0.21 | 0.16 | 0.00 | 0.00 | 1.08 | 1.54 | 5.51 | 0.50 | 5.14 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.15 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.56Mg0.38)3Al2Si3O12
G = -314871.23 (J) H = -269118.86 (J) S = 43.86 (J/K) V = 5.90 (cc) Cp = 25.23 (J/K)
almandine grossular pyrope
55.73 6.58 37.69

biotite mass = 1.89 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -30334.31 (J) H = -26040.85 (J) S = 4.12 (J/K) V = 0.69 (cc) Cp = 2.40 (J/K)

annite phlogopite
1.31 98.69

feldspar mass = 18.10 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -291567.78 (J) H = -251730.92 (J) S = 38.19 (J/K) V = 6.95 (cc) Cp = 22.02 (J/K)
albite anorthite sanidine
71.92 18.59 9.48

feldspar mass = 20.93 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -326890.60 (J) H = -281672.15 (J) S = 43.35 (J/K) V = 8.25 (cc) Cp = 24.74 (J/K)
albite anorthite sanidine
31.42 1.61 66.97

quartz mass = 16.36 (gm) density = 2.55 (gm/cc)
SiO2
G = -265153.22 (J) H = -231297.19 (J) S = 32.46 (J/K) V = 6.41 (cc) Cp = 18.99 (J/K)

rhm-oxide mass = 1.47 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.70Mg0.15Fe'"0.08Al0.16Ti0.88O3
G = -14953.47 (J) H = -12180.64 (J) S = 2.66 (J/K) V = 0.32 (cc) Cp = 1.38 (J/K)
geikielite hematite ilmenite pyrophanite corundum
14.64 4.05 70.29 3.22 7.79

Total solids mass = 81.91 (gm) density = 2.87 (gm/cc)
G = -1243770.61 (J) H = -1072040.61 (J) S = 164.63 (J/K) V = 28.51 (cc) Cp = 94.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.77 (gm/cc)
G = -1535717.91 (J) H = -1316726.74 (J) S = 209.93 (J/K) V = 36.11 (cc) Cp = 119.24 (J/K)

Oxygen delta moles = -0.00299695 delta grams = -0.095899
G = 693.51 (J) H = -72.55 (J) S = -0.73 (J/K) V = -259.93 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 760.00 (C) P = 6.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.04 COH = 1.17 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 16.92 (gm) density = 2.37 (gm/cc) viscosity = 6.22 (log 10 poise) (analysis in wt %)
G = -274609.19 (J) H = -230546.94 (J) S = 42.65 (J/K) V = 7.15 (cc) Cp = 23.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.75 | 0.38 | 19.31 | 0.06 | 0.00 | 0.21 | 0.22 | 0.15 | 0.00 | 0.00 | 1.09 | 1.48 | 5.42 | 0.54 | 5.40 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.89 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.56Mg0.37)3Al2Si3O12
G = -310220.20 (J) H = -265685.12 (J) S = 43.11 (J/K) V = 5.82 (cc) Cp = 24.89 (J/K)

almandine grossular pyrope
56.43 6.46 37.10

biotite mass = 2.14 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -34193.36 (J) H = -29420.48 (J) S = 4.62 (J/K) V = 0.78 (cc) Cp = 2.70 (J/K)
annite phlogopite
1.31 98.69

feldspar mass = 18.60 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -299257.19 (J) H = -258949.37 (J) S = 39.01 (J/K) V = 7.14 (cc) Cp = 22.70 (J/K)
albite anorthite sanidine
72.12 18.90 8.98

feldspar mass = 21.08 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.68Na0.30Ca0.01Al1.01Si2.99O8
G = -328571.07 (J) H = -283752.79 (J) S = 43.38 (J/K) V = 8.30 (cc) Cp = 24.92 (J/K)
albite anorthite sanidine
30.41 1.49 68.09

quartz mass = 16.78 (gm) density = 2.55 (gm/cc)
SiO2
G = -271647.95 (J) H = -237446.93 (J) S = 33.10 (J/K) V = 6.57 (cc) Cp = 19.46 (J/K)

rhm-oxide mass = 1.49 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.14Fe"'0.08Al0.16Ti0.88O3
G = -15118.07 (J) H = -12353.30 (J) S = 2.68 (J/K) V = 0.33 (cc) Cp = 1.39 (J/K)
geikielite hematite ilmenite pyrophanite corundum
14.24 3.80 70.60 3.26 8.09

Total solids mass = 82.98 (gm) density = 2.87 (gm/cc)
G = -1259007.84 (J) H = -1087608.00 (J) S = 165.90 (J/K) V = 28.94 (cc) Cp = 96.07 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.77 (gm/cc)
G = -1533617.03 (J) H = -1318154.95 (J) S = 208.55 (J/K) V = 36.08 (cc) Cp = 119.15 (J/K)

Oxygen delta moles = -0.0030132 delta grams = -0.0964188
G = 689.89 (J) H = -71.89 (J) S = -0.74 (J/K) V = -258.83 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 750.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.05 COH = 1.13 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 15.93 (gm) density = 2.37 (gm/cc) viscosity = 6.15 (log 10 poise) (analysis in wt %)
G = -258575.27 (J) H = -217448.20 (J) S = 40.20 (J/K) V = 6.73 (cc) Cp = 21.80 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1

65.12 0.36 19.83 0.06 0.00 0.19 0.23 0.13 0.00 0.00 1.10 1.43 5.31 0.57 5.68 0.00 0.00 0.00 0.00

garnet mass = 22.66 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.57Mg0.37)3Al2Si3O12
G = -305909.82 (J) H = -262532.83 (J) S = 42.40 (J/K) V = 5.75 (cc) Cp = 24.58 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.10 | 6.35 | 36.56 |

biotite mass = 2.36 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -37663.98 (J) H = -32480.28 (J) S = 5.07 (J/K) V = 0.86 (cc) Cp = 2.97 (J/K)

| annite | phlogopite |
|---|---|
| 1.30 | 98.70 |

feldspar mass = 19.05 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.72Ca0.19Al1.19Si2.81O8
G = -306290.01 (J) H = -265627.54 (J) S = 39.74 (J/K) V = 7.31 (cc) Cp = 23.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.31 | 19.19 | 8.50 |

feldspar mass = 21.22 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.29Ca0.01Al1.01Si2.99O8
G = -330145.14 (J) H = -285747.78 (J) S = 43.39 (J/K) V = 8.36 (cc) Cp = 25.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.44 | 1.39 | 69.17 |

quartz mass = 17.18 (gm) density = 2.55 (gm/cc)
SiO2
G = -277676.33 (J) H = -243210.63 (J) S = 33.69 (J/K) V = 6.73 (cc) Cp = 19.89 (J/K)

rhm-oxide mass = 1.50 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.14Fe'"0.07Al0.17Ti0.88O3
G = -15269.90 (J) H = -12516.63 (J) S = 2.69 (J/K) V = 0.33 (cc) Cp = 1.40 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.87 | 3.57 | 70.87 | 3.29 | 8.40 |

Total solids mass = 83.98 (gm) density = 2.86 (gm/cc)
G = -1272955.18 (J) H = -1102115.70 (J) S = 166.97 (J/K) V = 29.33 (cc) Cp = 97.32 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.77 (gm/cc)
G = -1531530.45 (J) H = -1319563.90 (J) S = 207.17 (J/K) V = 36.06 (cc) Cp = 119.12 (J/K)

Oxygen delta moles = -0.00302854 delta grams = -0.0969097
G = 686.00 (J) H = -71.20 (J) S = -0.74 (J/K) V = -257.63 (cc) Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 740.00 (C) P = 6.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.06 COH = 1.10 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 15.00 (gm) density = 2.37 (gm/cc) viscosity = 6.07 (log 10 poise) (analysis in wt %)
G = -243655.51 (J) H = -205235.44 (J) S = 37.92 (J/K) V = 6.34 (cc) Cp = 20.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.45 | 0.34 | 20.38 | 0.05 | 0.00 | 0.17 | 0.24 | 0.12 | 0.00 | 0.00 | 1.11 | 1.38 | 5.20 | 0.60 | 5.97 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.44 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.06Fe"0.58Mg0.36)3Al2Si3O12
G = -301913.93 (J) H = -259640.71 (J) S = 41.72 (J/K) V = 5.69 (cc) Cp = 24.28 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.72 | 6.22 | 36.06 |

biotite mass = 2.56 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -40784.17 (J) H = -35250.81 (J) S = 5.46 (J/K) V = 0.93 (cc) Cp = 3.22 (J/K)

| annite | phlogopite |
|---|---|
| 1.29 | 98.71 |

feldspar mass = 19.48 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.72Ca0.19Al1.19Si2.81O8
G = -312761.08 (J) H = -271844.47 (J) S = 40.39 (J/K) V = 7.47 (cc) Cp = 24.05 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.49 | 19.45 | 8.06 |

feldspar mass = 21.36 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.28Ca0.01Al1.01Si2.99O8
G = -331626.39 (J) H = -287668.33 (J) S = 43.39 (J/K) V = 8.41 (cc) Cp = 25.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.49 | 1.29 | 70.22 |

quartz mass = 17.55 (gm) density = 2.55 (gm/cc)
SiO2
G = -283305.02 (J) H = -248644.24 (J) S = 34.21 (J/K) V = 6.87 (cc) Cp = 20.29 (J/K)

rhm-oxide mass = 1.52 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.71Mg0.14Fe'"0.07Al0.17Ti0.88O3
G = -15411.97 (J) H = -12673.03 (J) S = 2.70 (J/K) V = 0.33 (cc) Cp = 1.42 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.53 | 3.34 | 71.08 | 3.32 | 8.74 |

Total solids mass = 84.90 (gm) density = 2.86 (gm/cc)
G = -1285802.57 (J) H = -1115721.58 (J) S = 167.87 (J/K) V = 29.70 (cc) Cp = 98.57 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.90 (gm) density = 2.77 (gm/cc)
G = -1529458.08 (J) H = -1320957.02 (J) S = 205.79 (J/K) V = 36.04 (cc) Cp = 119.16 (J/K)

Oxygen delta moles = -0.00304303 delta grams = -0.0973735
G = 681.85 (J) H = -70.47 (J) S = -0.74 (J/K) V = -256.33 (cc) Cp = -0.11 (J/K)

**********_____**********
Title: metapelite

T = 730.00 (C)  P = 6.000 (kbars)  log(10) f O2 = -15.49  delta HM = -5.20  NNO = 0.00  QFM = -0.07  COH = 1.06
IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid  mass = 13.03 (gm)  density = 2.35 (gm/cc)  viscosity = 5.75 (log 10 poise)  (analysis in wt %)
G = -211762.57 (J)  H = -178348.48 (J)  S = 33.31 (J/K)  V = 5.53 (cc)  Cp = 17.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.75 | 0.29 | 20.32 | 0.05 | 0.00 | 0.17 | 0.27 | 0.10 | 0.00 | 0.00 | 1.22 | 1.50 | 5.00 | 0.70 | 6.63 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 21.74 (gm)  density = 3.96 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.60Mg0.34)3Al2Si3O12
G = -290113.21 (J)  H = -249889.35 (J)  S = 40.10 (J/K)  V = 5.49 (cc)  Cp = 23.40 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.59 | 6.58 | 33.83 |

biotite  mass = 3.30 (gm)  density = 2.76 (gm/cc)  (analysis in mole %)
K(Fe"0.02Mg0.98)3AlSi3O10(OH)2
G = -52508.50 (J)  H = -45481.39 (J)  S = 7.01 (J/K)  V = 1.20 (cc)  Cp = 4.15 (J/K)

| annite | phlogopite |
|---|---|
| 1.52 | 98.48 |

feldspar  mass = 19.61 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.08Na0.73Ca0.19Al1.19Si2.81O8
G = -314533.06 (J)  H = -273983.84 (J)  S = 40.42 (J/K)  V = 7.52 (cc)  Cp = 24.46 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.92 | 19.35 | 7.73 |

feldspar  mass = 21.57 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -334311.94 (J)  H = -290639.21 (J)  S = 43.54 (J/K)  V = 8.49 (cc)  Cp = 25.61 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.79 | 1.18 | 71.02 |

quartz  mass = 18.41 (gm)  density = 2.55 (gm/cc)
SiO2
G = -296956.77 (J)  H = -261152.75 (J)  S = 35.69 (J/K)  V = 7.21 (cc)  Cp = 21.27 (J/K)

sillimanite  mass = 0.69 (gm)  density = 3.24 (gm/cc)
Al2SiO5
G = -11658.72 (J)  H = -10394.04 (J)  S = 1.26 (J/K)  V = 0.21 (cc)  Cp = 0.83 (J/K)

rhm-oxide  mass = 1.55 (gm)  density = 4.58 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.72Mg0.13Fe'"0.07Al0.17Ti0.88O3
G = -15564.13 (J)  H = -12822.93 (J)  S = 2.73 (J/K)  V = 0.34 (cc)  Cp = 1.44 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.51 | 3.34 | 72.37 | 3.32 | 8.47 |

Total solids  mass = 86.87 (gm)  density = 2.85 (gm/cc)

G = -1315646.33 (J)  H = -1144363.50 (J)  S = 170.74 (J/K)  V = 30.46 (cc)  Cp = 101.15 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.90 (gm)  density = 2.78 (gm/cc)
G = -1527408.89 (J)  H = -1322711.98 (J)  S = 204.05 (J/K)  V = 35.99 (cc)  Cp = 119.14 (J/K)

Oxygen  delta moles = -0.00304265  delta grams = -0.0973613
G = 674.34 (J)  H = -69.40 (J)  S = -0.74 (J/K)  V = -253.77 (cc)  Cp = -0.11 (J/K)

**********----------**********
Title: metapelite

T = 1300.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.29  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.51 (log 10 poise)  (analysis in wt %)
G = -1665412.59 (J)  H = -1223175.53 (J)  S = 281.12 (J/K)  V = 39.73 (cc)  Cp = 143.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.80 | 16.91 | 1.00 | 0.00 | 5.80 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.51 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1665412.59 (J)  H = -1223175.53 (J)  S = 281.12 (J/K)  V = 39.73 (cc)  Cp = 143.66 (J/K)

Oxygen  delta moles = 2.28983e-16  delta grams = 7.3272e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1290.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.27  COH = 2.27  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.56 (log 10 poise)  (analysis in wt %)
G = -1662607.83 (J)  H = -1224613.62 (J)  S = 280.20 (J/K)  V = 39.70 (cc)  Cp = 143.65 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.80 | 16.91 | 1.00 | 0.00 | 5.80 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1662607.83 (J)  H = -1224613.62 (J)  S = 280.20 (J/K)  V = 39.70 (cc)  Cp = 143.65 (J/K)

Oxygen  delta moles = 3.33931e-06  delta grams = 0.000106854
G = -1.21 (J)  H = 0.14 (J)  S = 0.00 (J/K)  V = 0.43 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1280.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.26  COH = 2.25  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1659812.50 (J)  H = -1226051.82 (J)  S = 279.28 (J/K)  V = 39.67 (cc)  Cp = 143.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.80 | 16.91 | 1.00 | 0.00 | 5.80 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1659812.50 (J)  H = -1226051.82 (J)  S = 279.28 (J/K)  V = 39.67 (cc)  Cp = 143.64 (J/K)

Oxygen  delta moles = 7.10109e-06  delta grams = 0.000227226
G = -2.56 (J)  H = 0.30 (J)  S = 0.00 (J/K)  V = 0.92 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1270.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.25  COH = 2.24  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.52 (gm/cc)  viscosity = 3.67 (log 10 poise)  (analysis in wt %)
G = -1657026.65 (J)  H = -1227490.15 (J)  S = 278.35 (J/K)  V = 39.64 (cc)  Cp = 143.64 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.80 | 16.91 | 1.00 | 0.00 | 5.80 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.67 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.52 (gm/cc)
G = -1657026.65 (J)  H = -1227490.15 (J)  S = 278.35 (J/K)  V = 39.64 (cc)  Cp = 143.64 (J/K)

Oxygen  delta moles = 1.12972e-05  delta grams = 0.000361498
G = -4.04 (J)  H = 0.48 (J)  S = 0.00 (J/K)  V = 1.45 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1260.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -6.90  delta HM = -4.83  NNO = 0.00  QFM = 0.25  COH = 2.22  IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.64 (gm)  density = 2.52 (gm/cc)  viscosity = 3.74 (log 10 poise)  (analysis in wt %)
G = -1648532.90 (J)  H = -1224733.09 (J)  S = 276.42 (J/K)  V = 39.48 (cc)  Cp = 143.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.45 | 0.80 | 16.96 | 1.00 | 0.00 | 5.77 | 0.06 | 2.84 | 0.00 | 0.00 | 1.53 | 2.55 | 3.94 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.36 (gm)  density = 3.29 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.44Mg1.48Fe'"0.03Ti0.00Al0.12Si1.93O6
G = -5711.48 (J)  H = -4343.93 (J)  S = 0.89 (J/K)  V = 0.11 (cc)  Cp = 0.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.03 | 98.74 | 43.74 | 4.43 | -4.04 | 6.96 | 0.19 |

Total solids  mass = 0.36 (gm)  density = 3.29 (gm/cc)
G = -5711.48 (J)  H = -4343.93 (J)  S = 0.89 (J/K)  V = 0.11 (cc)  Cp = 0.45 (J/K)

Viscosity of the System: 3.74 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1654244.38 (J)  H = -1229077.01 (J)  S = 277.32 (J/K)  V = 39.59 (cc)  Cp = 143.50 (J/K)

Oxygen  delta moles = 4.82638e-06  delta grams = 0.000154438
G = -1.71 (J)  H = 0.20 (J)  S = 0.00 (J/K)  V = 0.62 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1250.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -7.01  delta HM = -4.83  NNO = 0.00  QFM = 0.24  COH = 2.21  IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid  mass = 98.88 (gm)  density = 2.52 (gm/cc)  viscosity = 3.82 (log 10 poise)  (analysis in wt %)
G = -1633963.05 (J)  H = -1217485.04 (J)  S = 273.43 (J/K)  V = 39.19 (cc)  Cp = 141.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.53 | 0.80 | 17.07 | 0.99 | 0.00 | 5.70 | 0.06 | 2.66 | 0.00 | 0.00 | 1.54 | 2.56 | 3.97 | 0.09 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 1.12 (gm)  density = 3.30 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.45Mg1.46Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -17502.67 (J)  H = -13334.53 (J)  S = 2.74 (J/K)  V = 0.34 (cc)  Cp = 1.39 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -51.78 | 98.68 | 45.37 | 4.55 | -4.15 | 7.13 | 0.20 |

Total solids  mass = 1.12 (gm)  density = 3.30 (gm/cc)
G = -17502.67 (J)  H = -13334.53 (J)  S = 2.74 (J/K)  V = 0.34 (cc)  Cp = 1.39 (J/K)

Viscosity of the System: 3.84 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1651465.72 (J) H = -1230819.56 (J) S = 276.17 (J/K) V = 39.53 (cc) Cp = 143.23 (J/K)

Oxygen delta moles = -1.52397e-05 delta grams = -0.000487651
G = 5.37 (J) H = -0.63 (J) S = -0.00 (J/K) V = -1.93 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1240.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.12 delta HM = -4.84 NNO = 0.00 QFM = 0.24 COH = 2.19 IW = 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 98.15 (gm) density = 2.52 (gm/cc) viscosity = 3.91 (log 10 poise) (analysis in wt %)
G = -1619892.77 (J) H = -1210564.32 (J) S = 270.51 (J/K) V = 38.91 (cc) Cp = 140.66 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.61 | 0.81 | 17.17 | 0.99 | 0.00 | 5.63 | 0.06 | 2.48 | 0.00 | 0.00 | 1.55 | 2.58 | 4.00 | 0.09 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.85 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.47Mg1.44Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -28804.83 (J) H = -21982.14 (J) S = 4.51 (J/K) V = 0.56 (cc) Cp = 2.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -53.59 | 98.62 | 47.05 | 4.67 | -4.26 | 7.30 | 0.21 |

Total solids mass = 1.85 (gm) density = 3.30 (gm/cc)
G = -28804.83 (J) H = -21982.14 (J) S = 4.51 (J/K) V = 0.56 (cc) Cp = 2.30 (J/K)

Viscosity of the System: 3.93 (log 10 poise)

System mass = 100.00 (gm) density = 2.53 (gm/cc)
G = -1648697.60 (J) H = -1232546.46 (J) S = 275.02 (J/K) V = 39.47 (cc) Cp = 142.96 (J/K)

Oxygen delta moles = -3.6988e-05 delta grams = -0.00118357
G = 12.94 (J) H = -1.52 (J) S = -0.01 (J/K) V = -4.65 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1230.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.17 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 97.44 (gm) density = 2.52 (gm/cc) viscosity = 4.00 (log 10 poise) (analysis in wt %)
G = -1606279.93 (J) H = -1203942.38 (J) S = 267.66 (J/K) V = 38.64 (cc) Cp = 139.53 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.69 | 0.81 | 17.28 | 0.98 | 0.00 | 5.55 | 0.06 | 2.32 | 0.00 | 0.00 | 1.56 | 2.60 | 4.03 | 0.09 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.56 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.49Mg1.42Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -39659.97 (J) H = -30316.64 (J) S = 6.22 (J/K) V = 0.77 (cc) Cp = 3.18 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -55.45 | 98.56 | 48.78 | 4.80 | -4.39 | 7.47 | 0.22 |

Total solids mass = 2.56 (gm) density = 3.31 (gm/cc)
G = -39659.97 (J) H = -30316.64 (J) S = 6.22 (J/K) V = 0.77 (cc) Cp = 3.18 (J/K)

Viscosity of the System: 4.03 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1645939.91 (J) H = -1234259.02 (J) S = 273.88 (J/K) V = 39.41 (cc) Cp = 142.71 (J/K)

Oxygen delta moles = -6.05906e-05 delta grams = -0.00193883
G = 21.04 (J) H = -2.47 (J) S = -0.02 (J/K) V = -7.57 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1220.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.23 COH = 2.15 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 96.75 (gm) density = 2.52 (gm/cc) viscosity = 4.08 (log 10 poise) (analysis in wt %)
G = -1593085.42 (J) H = -1197592.59 (J) S = 264.87 (J/K) V = 38.37 (cc) Cp = 138.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.77 | 0.82 | 17.38 | 0.97 | 0.00 | 5.46 | 0.06 | 2.16 | 0.00 | 0.00 | 1.57 | 2.62 | 4.06 | 0.09 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.25 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.51Mg1.40Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -50107.12 (J) H = -38365.88 (J) S = 7.86 (J/K) V = 0.98 (cc) Cp = 4.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -57.36 | 98.49 | 50.57 | 4.93 | -4.51 | 7.66 | 0.23 |

Total solids mass = 3.25 (gm) density = 3.32 (gm/cc)
G = -50107.12 (J) H = -38365.88 (J) S = 7.86 (J/K) V = 0.98 (cc) Cp = 4.02 (J/K)

Viscosity of the System: 4.13 (log 10 poise)

System mass = 100.00 (gm) density = 2.54 (gm/cc)
G = -1643192.55 (J) H = -1235958.47 (J) S = 272.73 (J/K) V = 39.35 (cc) Cp = 142.46 (J/K)

Oxygen delta moles = -8.62209e-05 delta grams = -0.00275897
G = 29.72 (J) H = -3.48 (J) S = -0.02 (J/K) V = -10.70 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1210.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.45 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.14 IW

= 4.17

Constraint Flags: fO2 path = NNO

Liquid mass = 96.07 (gm) density = 2.52 (gm/cc) viscosity = 4.17 (log 10 poise) (analysis in wt %)
G = -1580273.12 (J) H = -1191490.19 (J) S = 262.13 (J/K) V = 38.11 (cc) Cp = 137.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.86 | 0.82 | 17.47 | 0.96 | 0.00 | 5.37 | 0.06 | 2.01 | 0.00 | 0.00 | 1.58 | 2.64 | 4.09 | 0.09 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.92 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.52Mg1.38Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -60182.30 (J) H = -46155.74 (J) S = 9.46 (J/K) V = 1.18 (cc) Cp = 4.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -59.33 | 98.42 | 52.41 | 5.06 | -4.65 | 7.84 | 0.24 |

Total solids mass = 3.92 (gm) density = 3.33 (gm/cc)
G = -60182.30 (J) H = -46155.74 (J) S = 9.46 (J/K) V = 1.18 (cc) Cp = 4.84 (J/K)

Viscosity of the System: 4.23 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1640455.42 (J) H = -1237645.93 (J) S = 271.59 (J/K) V = 39.29 (cc) Cp = 142.22 (J/K)

Oxygen delta moles = -0.000114051 delta grams = -0.00364951
G = 39.02 (J) H = -4.56 (J) S = -0.03 (J/K) V = -14.06 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1200.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.56 delta HM = -4.85 NNO = 0.00 QFM = 0.22 COH = 2.12 IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid mass = 95.41 (gm) density = 2.52 (gm/cc) viscosity = 4.26 (log 10 poise) (analysis in wt %)
G = -1567807.94 (J) H = -1185566.80 (J) S = 259.47 (J/K) V = 37.86 (cc) Cp = 129.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.95 | 0.83 | 17.57 | 0.94 | 0.00 | 5.27 | 0.06 | 1.87 | 0.00 | 0.00 | 1.59 | 2.66 | 4.11 | 0.09 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.59 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.54Mg1.36Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -69920.40 (J) H = -53711.46 (J) S = 11.00 (J/K) V = 1.37 (cc) Cp = 5.64 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -61.35 | 98.35 | 54.29 | 5.21 | -4.79 | 8.04 | 0.25 |

Total solids mass = 4.59 (gm) density = 3.34 (gm/cc)
G = -69920.40 (J) H = -53711.46 (J) S = 11.00 (J/K) V = 1.37 (cc) Cp = 5.64 (J/K)

Viscosity of the System: 4.33 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1637728.34 (J) H = -1239278.26 (J) S = 270.47 (J/K) V = 39.23 (cc) Cp = 135.53 (J/K)

Oxygen delta moles = -0.000144258 delta grams = -0.00461607
G = 48.98 (J) H = -5.71 (J) S = -0.04 (J/K) V = -17.67 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1190.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.21 COH = 2.10 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 94.76 (gm) density = 2.52 (gm/cc) viscosity = 4.36 (log 10 poise) (analysis in wt %)
G = -1555654.23 (J) H = -1179821.74 (J) S = 256.87 (J/K) V = 37.61 (cc) Cp = 128.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.04 | 0.83 | 17.67 | 0.93 | 0.00 | 5.16 | 0.06 | 1.74 | 0.00 | 0.00 | 1.59 | 2.67 | 4.14 | 0.10 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.24 (gm) density = 3.35 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.56Mg1.33Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -79356.69 (J) H = -61058.87 (J) S = 12.51 (J/K) V = 1.56 (cc) Cp = 6.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -63.42 | 98.28 | 56.22 | 5.36 | -4.93 | 8.24 | 0.26 |

Total solids mass = 5.24 (gm) density = 3.35 (gm/cc)
G = -79356.69 (J) H = -61058.87 (J) S = 12.51 (J/K) V = 1.56 (cc) Cp = 6.42 (J/K)

Viscosity of the System: 4.43 (log 10 poise)

System mass = 99.99 (gm) density = 2.55 (gm/cc)
G = -1635010.92 (J) H = -1240880.62 (J) S = 269.37 (J/K) V = 39.18 (cc) Cp = 135.31 (J/K)

Oxygen delta moles = -0.000177028 delta grams = -0.00566468
G = 59.66 (J) H = -6.95 (J) S = -0.05 (J/K) V = -21.54 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1180.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.20 COH = 2.08 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 94.11 (gm) density = 2.52 (gm/cc) viscosity = 4.45 (log 10 poise) (analysis in wt %)
G = -1543785.89 (J) H = -1174257.16 (J) S = 254.29 (J/K) V = 37.37 (cc) Cp = 127.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.13 | 0.84 | 17.76 | 0.91 | 0.00 | 5.05 | 0.06 | 1.62 | 0.00 | 0.00 | 1.60 | 2.69 | 4.17 | 0.10 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 5.88 (gm) density = 3.36 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"0.58Mg1.31Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -88517.18 (J) H = -68216.99 (J) S = 13.97 (J/K) V = 1.75 (cc) Cp = 7.19 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -65.53 | 98.21 | 58.18 | 5.51 | -5.09 | 8.45 | 0.26 |

Total solids mass = 5.88 (gm) density = 3.36 (gm/cc)
G = -88517.18 (J) H = -68216.99 (J) S = 13.97 (J/K) V = 1.75 (cc) Cp = 7.19 (J/K)

Viscosity of the System: 4.53 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1632303.07 (J) H = -1242474.15 (J) S = 268.26 (J/K) V = 39.12 (cc) Cp = 135.09 (J/K)

Oxygen delta moles = -0.000212514 delta grams = -0.0068002
G = 71.07 (J) H = -8.26 (J) S = -0.05 (J/K) V = -25.68 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1170.00 (C) P = 7.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.20 COH = 2.07 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 93.48 (gm) density = 2.52 (gm/cc) viscosity = 4.54 (log 10 poise) (analysis in wt %)
G = -1532180.83 (J) H = -1168857.43 (J) S = 251.76 (J/K) V = 37.13 (cc) Cp = 126.95 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.23 | 0.85 | 17.85 | 0.90 | 0.00 | 4.92 | 0.06 | 1.50 | 0.00 | 0.00 | 1.61 | 2.71 | 4.20 | 0.10 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.51 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.60Mg1.29Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -97423.92 (J) H = -75202.07 (J) S = 15.40 (J/K) V = 1.93 (cc) Cp = 7.93 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -67.67 | 98.14 | 60.17 | 5.68 | -5.25 | 8.66 | 0.27 |

Total solids mass = 6.51 (gm) density = 3.37 (gm/cc)
G = -97423.92 (J) H = -75202.07 (J) S = 15.40 (J/K) V = 1.93 (cc) Cp = 7.93 (J/K)

Viscosity of the System: 4.63 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1629604.75 (J) H = -1244059.50 (J) S = 267.16 (J/K) V = 39.06 (cc) Cp = 134.88 (J/K)

Oxygen delta moles = -0.000250848 delta grams = -0.00802682
G = 83.24 (J) H = -9.66 (J) S = -0.06 (J/K) V = -30.10 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1160.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.04 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.05 IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid mass = 92.85 (gm) density = 2.52 (gm/cc) viscosity = 4.64 (log 10 poise) (analysis in wt %)
G = -1520820.73 (J) H = -1163609.46 (J) S = 249.25 (J/K) V = 36.90 (cc) Cp = 126.01 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.33 | 0.85 | 17.94 | 0.88 | 0.00 | 4.79 | 0.07 | 1.39 | 0.00 | 0.00 | 1.62 | 2.73 | 4.23 | 0.10 | 1.08 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.14 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.62Mg1.26Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -106095.21 (J) H = -82027.70 (J) S = 16.79 (J/K) V = 2.11 (cc) Cp = 8.66 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -69.85 | 98.06 | 62.19 | 5.85 | -5.42 | 8.88 | 0.28 |

Total solids mass = 7.14 (gm) density = 3.38 (gm/cc)
G = -106095.21 (J) H = -82027.70 (J) S = 16.79 (J/K) V = 2.11 (cc) Cp = 8.66 (J/K)

Viscosity of the System: 4.74 (log 10 poise)

System mass = 99.99 (gm) density = 2.56 (gm/cc)
G = -1626915.94 (J) H = -1245637.16 (J) S = 266.04 (J/K) V = 39.01 (cc) Cp = 134.67 (J/K)

Oxygen delta moles = -0.000292131 delta grams = -0.00934785
G = 96.19 (J) H = -11.14 (J) S = -0.07 (J/K) V = -34.81 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1150.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.16 delta HM = -4.88 NNO = 0.00 QFM = 0.19 COH = 2.03 IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid mass = 92.24 (gm) density = 2.52 (gm/cc) viscosity = 4.73 (log 10 poise) (analysis in wt %)
G = -1509691.24 (J) H = -1158502.81 (J) S = 246.77 (J/K) V = 36.67 (cc) Cp = 125.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.43 | 0.86 | 18.03 | 0.86 | 0.00 | 4.65 | 0.07 | 1.28 | 0.00 | 0.00 | 1.62 | 2.75 | 4.26 | 0.10 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 7.75 (gm) density = 3.39 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.64Mg1.24Fe'"0.04Ti0.00Al0.15Si1.90O6
G = -114545.41 (J) H = -88704.71 (J) S = 18.16 (J/K) V = 2.29 (cc) Cp = 9.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.04 | 97.99 | 64.21 | 6.03 | -5.60 | 9.11 | 0.29 |

Total solids mass = 7.75 (gm) density = 3.39 (gm/cc)
G = -114545.41 (J) H = -88704.71 (J) S = 18.16 (J/K) V = 2.29 (cc) Cp = 9.38 (J/K)

Viscosity of the System: 4.84 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1624236.65 (J) H = -1247207.51 (J) S = 264.93 (J/K) V = 38.95 (cc) Cp = 134.47 (J/K)

Oxygen delta moles = -0.000336436 delta grams = -0.0107656
G = 109.92 (J) H = -12.71 (J) S = -0.09 (J/K) V = -39.81 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1140.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.28 delta HM = -4.89 NNO = 0.00 QFM = 0.18 COH = 2.01 IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid mass = 91.62 (gm) density = 2.51 (gm/cc) viscosity = 4.83 (log 10 poise) (analysis in wt %)
G = -1498782.13 (J) H = -1153529.85 (J) S = 244.31 (J/K) V = 36.44 (cc) Cp = 124.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.54 | 0.86 | 18.12 | 0.84 | 0.00 | 4.51 | 0.07 | 1.19 | 0.00 | 0.00 | 1.63 | 2.76 | 4.28 | 0.10 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.36 (gm) density = 3.40 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.66Mg1.22Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -122784.77 (J) H = -95240.95 (J) S = 19.49 (J/K) V = 2.46 (cc) Cp = 10.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.24 | 97.92 | 66.24 | 6.22 | -5.79 | 9.35 | 0.30 |

Total solids mass = 8.36 (gm) density = 3.40 (gm/cc)
G = -122784.77 (J) H = -95240.95 (J) S = 19.49 (J/K) V = 2.46 (cc) Cp = 10.08 (J/K)

Viscosity of the System: 4.95 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1621566.90 (J) H = -1248770.80 (J) S = 263.81 (J/K) V = 38.90 (cc) Cp = 134.26 (J/K)

Oxygen delta moles = -0.000383794 delta grams = -0.0122809
G = 124.41 (J) H = -14.36 (J) S = -0.10 (J/K) V = -45.09 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1130.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.41 delta HM = -4.89 NNO = 0.00 QFM = 0.17 COH = 1.99 IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid mass = 91.02 (gm) density = 2.51 (gm/cc) viscosity = 4.93 (log 10 poise) (analysis in wt %)
G = -1488087.30 (J) H = -1148685.82 (J) S = 241.89 (J/K) V = 36.21 (cc) Cp = 123.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.65 | 0.87 | 18.21 | 0.82 | 0.00 | 4.35 | 0.07 | 1.10 | 0.00 | 0.00 | 1.64 | 2.78 | 4.31 | 0.10 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 8.97 (gm) density = 3.41 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.68Mg1.19Fe'"0.04Ti0.00Al0.16Si1.90O6
G = -130819.45 (J) H = -101641.32 (J) S = 20.79 (J/K) V = 2.63 (cc) Cp = 10.78 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-76.44 97.84 68.26 6.42 -5.99 9.59 0.31

Total solids mass = 8.97 (gm) density = 3.41 (gm/cc)
G = -130819.45 (J) H = -101641.32 (J) S = 20.79 (J/K) V = 2.63 (cc) Cp = 10.78 (J/K)

Viscosity of the System: 5.06 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1618906.75 (J) H = -1250327.13 (J) S = 262.68 (J/K) V = 38.84 (cc) Cp = 134.06 (J/K)

Oxygen delta moles = -0.000434194 delta grams = -0.0138937
G = 139.64 (J) H = -16.09 (J) S = -0.11 (J/K) V = -50.65 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1120.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.17 COH = 1.97 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 90.42 (gm) density = 2.51 (gm/cc) viscosity = 5.03 (log 10 poise) (analysis in wt %)
G = -1477604.61 (J) H = -1143968.70 (J) S = 239.48 (J/K) V = 35.99 (cc) Cp = 122.41 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.77 | 0.87 | 18.30 | 0.80 | 0.00 | 4.19 | 0.07 | 1.01 | 0.00 | 0.00 | 1.64 | 2.80 | 4.34 | 0.10 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 9.57 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.70Mg1.17Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -138651.66 (J) H = -107907.79 (J) S = 22.07 (J/K) V = 2.80 (cc) Cp = 11.45 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-78.63 97.77 70.25 6.64 -6.20 9.84 0.32

Total solids mass = 9.57 (gm) density = 3.42 (gm/cc)
G = -138651.66 (J) H = -107907.79 (J) S = 22.07 (J/K) V = 2.80 (cc) Cp = 11.45 (J/K)

Viscosity of the System: 5.17 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1616256.27 (J) H = -1251876.49 (J) S = 261.55 (J/K) V = 38.79 (cc) Cp = 133.87 (J/K)

Oxygen delta moles = -0.000487579 delta grams = -0.015602
G = 155.56 (J) H = -17.89 (J) S = -0.12 (J/K) V = -56.48 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1110.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.66 delta HM = -4.90 NNO = 0.00 QFM = 0.16 COH = 1.95 IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid mass = 89.83 (gm) density = 2.51 (gm/cc) viscosity = 5.14 (log 10 poise) (analysis in wt %)
G = -1467335.63 (J) H = -1139379.11 (J) S = 237.11 (J/K) V = 35.78 (cc) Cp = 121.55 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.88 | 0.88 | 18.38 | 0.77 | 0.00 | 4.03 | 0.07 | 0.94 | 0.00 | 0.00 | 1.65 | 2.82 | 4.37 | 0.10 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.15 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.72Mg1.15Fe'"0.04Ti0.00Al0.17Si1.89O6
G = -146279.93 (J) H = -114039.61 (J) S = 23.31 (J/K) V = 2.96 (cc) Cp = 12.12 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -80.79 | 97.70 | 72.21 | 6.85 | -6.42 | 10.10 | 0.33 |

Total solids mass = 10.15 (gm) density = 3.43 (gm/cc)
G = -146279.93 (J) H = -114039.61 (J) S = 23.31 (J/K) V = 2.96 (cc) Cp = 12.12 (J/K)

Viscosity of the System: 5.28 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1613615.56 (J) H = -1253418.72 (J) S = 260.42 (J/K) V = 38.74 (cc) Cp = 133.67 (J/K)

Oxygen delta moles = -0.000543845 delta grams = -0.0174024
G = 172.13 (J) H = -19.76 (J) S = -0.14 (J/K) V = -62.54 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1100.00 (C) P = 7.000 (kbars) log(10) f O2 = -8.80 delta HM = -4.91 NNO = 0.00 QFM = 0.15 COH = 1.93 IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid mass = 89.25 (gm) density = 2.51 (gm/cc) viscosity = 5.24 (log 10 poise) (analysis in wt %)
G = -1457285.11 (J) H = -1134919.97 (J) S = 234.76 (J/K) V = 35.57 (cc) Cp = 120.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.00 | 0.88 | 18.46 | 0.75 | 0.00 | 3.86 | 0.07 | 0.86 | 0.00 | 0.00 | 1.65 | 2.84 | 4.40 | 0.10 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.74 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.74Mg1.13Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -153699.65 (J) H = -120033.62 (J) S = 24.52 (J/K) V = 3.12 (cc) Cp = 12.77 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.91 | 97.64 | 74.13 | 7.08 | -6.64 | 10.36 | 0.34 |

Total solids mass = 10.74 (gm) density = 3.44 (gm/cc)
G = -153699.65 (J) H = -120033.62 (J) S = 24.52 (J/K) V = 3.12 (cc) Cp = 12.77 (J/K)

Viscosity of the System: 5.39 (log 10 poise)

System mass = 99.98 (gm) density = 2.58 (gm/cc)
G = -1610984.76 (J) H = -1254953.60 (J) S = 259.28 (J/K) V = 38.68 (cc) Cp = 133.48 (J/K)

Oxygen delta moles = -0.00060284 delta grams = -0.0192902

G = 189.26 (J)  H = -21.68 (J)  S = -0.15 (J/K)  V = -68.82 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1090.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -8.93  delta HM = -4.91  NNO = 0.00  QFM = 0.15  COH = 1.91  IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid  mass = 88.67 (gm)  density = 2.51 (gm/cc)  viscosity = 5.35 (log 10 poise)  (analysis in wt %)
G = -1447460.34 (J)  H = -1130596.11 (J)  S = 232.45 (J/K)  V = 35.36 (cc)  Cp = 119.88 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.12 | 0.89 | 18.54 | 0.72 | 0.00 | 3.68 | 0.07 | 0.80 | 0.00 | 0.00 | 1.66 | 2.85 | 4.43 | 0.10 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.31 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.76Mg1.10Fe'"0.04Ti0.00Al0.18Si1.89O6
G = -160903.67 (J)  H = -125884.68 (J)  S = 25.69 (J/K)  V = 3.28 (cc)  Cp = 13.41 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -84.98 | 97.57 | 75.99 | 7.32 | -6.88 | 10.62 | 0.35 |

Total solids  mass = 11.31 (gm)  density = 3.45 (gm/cc)
G = -160903.67 (J)  H = -125884.68 (J)  S = 25.69 (J/K)  V = 3.28 (cc)  Cp = 13.41 (J/K)

Viscosity of the System: 5.51 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.59 (gm/cc)
G = -1608364.01 (J)  H = -1256480.79 (J)  S = 258.14 (J/K)  V = 38.63 (cc)  Cp = 133.29 (J/K)

Oxygen  delta moles = -0.000664369  delta grams = -0.021259
G = 206.88 (J)  H = -23.66 (J)  S = -0.17 (J/K)  V = -75.30 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1080.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.06  delta HM = -4.92  NNO = 0.00  QFM = 0.14  COH = 1.89  IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid  mass = 88.11 (gm)  density = 2.51 (gm/cc)  viscosity = 5.45 (log 10 poise)  (analysis in wt %)
G = -1437870.39 (J)  H = -1126413.72 (J)  S = 230.17 (J/K)  V = 35.15 (cc)  Cp = 119.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.25 | 0.89 | 18.62 | 0.69 | 0.00 | 3.51 | 0.07 | 0.74 | 0.00 | 0.00 | 1.67 | 2.87 | 4.45 | 0.10 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.86 (gm)  density = 3.46 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.78Mg1.08Fe'"0.04Ti0.00Al0.19Si1.89O6
G = -167883.09 (J)  H = -131586.21 (J)  S = 26.82 (J/K)  V = 3.43 (cc)  Cp = 14.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -86.99 | 97.50 | 77.78 | 7.57 | -7.12 | 10.89 | 0.37 |

Total solids mass = 11.86 (gm) density = 3.46 (gm/cc)
G = -167883.09 (J) H = -131586.21 (J) S = 26.82 (J/K) V = 3.43 (cc) Cp = 14.03 (J/K)

Viscosity of the System: 5.62 (log 10 poise)

System mass = 99.98 (gm) density = 2.59 (gm/cc)
G = -1605753.48 (J) H = -1257999.93 (J) S = 257.00 (J/K) V = 38.58 (cc) Cp = 133.10 (J/K)

Oxygen delta moles = -0.000728196 delta grams = -0.0233014
G = 224.91 (J) H = -25.67 (J) S = -0.19 (J/K) V = -81.93 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1070.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.87 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 87.56 (gm) density = 2.51 (gm/cc) viscosity = 5.56 (log 10 poise) (analysis in wt %)
G = -1428525.25 (J) H = -1122379.82 (J) S = 227.93 (J/K) V = 34.95 (cc) Cp = 118.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.37 | 0.90 | 18.70 | 0.66 | 0.00 | 3.33 | 0.07 | 0.68 | 0.00 | 0.00 | 1.67 | 2.89 | 4.48 | 0.10 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.41 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.79Mg1.06Fe'"0.04Ti0.00Al0.19Si1.88O6
G = -174628.10 (J) H = -137130.79 (J) S = 27.92 (J/K) V = 3.58 (cc) Cp = 14.63 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.92 | 97.44 | 79.50 | 7.82 | -7.37 | 11.15 | 0.38 |

Total solids mass = 12.41 (gm) density = 3.47 (gm/cc)
G = -174628.10 (J) H = -137130.79 (J) S = 27.92 (J/K) V = 3.58 (cc) Cp = 14.63 (J/K)

Viscosity of the System: 5.74 (log 10 poise)

System mass = 99.97 (gm) density = 2.59 (gm/cc)
G = -1603153.35 (J) H = -1259510.61 (J) S = 255.85 (J/K) V = 38.53 (cc) Cp = 132.92 (J/K)

Oxygen delta moles = -0.000794054 delta grams = -0.0254088
G = 243.23 (J) H = -27.70 (J) S = -0.20 (J/K) V = -88.67 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1060.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.13 COH = 1.84 IW = 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 87.03 (gm) density = 2.50 (gm/cc) viscosity = 5.67 (log 10 poise) (analysis in wt %)
G = -1419435.03 (J) H = -1118501.68 (J) S = 225.73 (J/K) V = 34.76 (cc) Cp = 117.52 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.50 0.90 18.77 0.64 0.00 3.15 0.07 0.63 0.00 0.00 1.68 2.91 4.51 0.10 1.16 0.00 0.00 0.00 0.00

orthopyroxene mass = 12.94 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.81Mg1.04Fe"'0.04Ti0.00Al0.20Si1.88O6
G = -181128.78 (J) H = -142510.79 (J) S = 28.97 (J/K) V = 3.72 (cc) Cp = 15.21 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-90.78 97.38 81.14 8.08 -7.63 11.42 0.39

Total solids mass = 12.94 (gm) density = 3.48 (gm/cc)
G = -181128.78 (J) H = -142510.79 (J) S = 28.97 (J/K) V = 3.72 (cc) Cp = 15.21 (J/K)

Viscosity of the System: 5.86 (log 10 poise)

System mass = 99.97 (gm) density = 2.60 (gm/cc)
G = -1600563.81 (J) H = -1261012.47 (J) S = 254.70 (J/K) V = 38.48 (cc) Cp = 132.74 (J/K)

Oxygen delta moles = -0.000861648 delta grams = -0.0275717
G = 261.75 (J) H = -29.75 (J) S = -0.22 (J/K) V = -95.51 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1050.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.12 COH = 1.82 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 86.51 (gm) density = 2.50 (gm/cc) viscosity = 5.78 (log 10 poise) (analysis in wt %)
G = -1410609.12 (J) H = -1114786.25 (J) S = 223.57 (J/K) V = 34.57 (cc) Cp = 116.78 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.62 0.91 18.84 0.61 0.00 2.97 0.07 0.58 0.00 0.00 1.68 2.92 4.54 0.10 1.16 0.00 0.00 0.00 0.00

orthopyroxene mass = 13.46 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.83Mg1.02Fe"'0.04Ti0.00Al0.20Si1.88O6
G = -187375.94 (J) H = -147718.89 (J) S = 29.97 (J/K) V = 3.86 (cc) Cp = 15.78 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-92.55 97.32 82.69 8.35 -7.89 11.68 0.40

Total solids mass = 13.46 (gm) density = 3.49 (gm/cc)
G = -187375.94 (J) H = -147718.89 (J) S = 29.97 (J/K) V = 3.86 (cc) Cp = 15.78 (J/K)

Viscosity of the System: 5.98 (log 10 poise)

System mass = 99.97 (gm) density = 2.60 (gm/cc)
G = -1597985.06 (J) H = -1262505.14 (J) S = 253.55 (J/K) V = 38.43 (cc) Cp = 132.56 (J/K)

Oxygen delta moles = -0.000930668 delta grams = -0.0297803
G = 280.35 (J) H = -31.79 (J) S = -0.24 (J/K) V = -102.38 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1040.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.62  delta HM = -4.94  NNO = 0.00  QFM = 0.11  COH = 1.80  IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid  mass = 84.76 (gm)  density = 2.50 (gm/cc)  viscosity = 5.89 (log 10 poise)  (analysis in wt %)
G = -1381584.86 (J)  H = -1094974.87 (J)  S = 218.26 (J/K)  V = 33.90 (cc)  Cp = 114.32 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.82 | 0.92 | 18.85 | 0.58 | 0.00 | 2.80 | 0.07 | 0.53 | 0.00 | 0.00 | 1.64 | 2.88 | 4.62 | 0.11 | 1.19 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 14.05 (gm)  density = 3.50 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.85Mg1.00Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -194470.25 (J)  H = -153598.04 (J)  S = 31.13 (J/K)  V = 4.02 (cc)  Cp = 16.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.66 | 97.36 | 84.53 | 8.56 | -8.10 | 11.89 | 0.40 |

feldspar  mass = 1.16 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.07Na0.67Ca0.26Al1.26Si2.74O8
G = -19351.33 (J)  H = -15731.11 (J)  S = 2.76 (J/K)  V = 0.44 (cc)  Cp = 1.42 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.05 | 26.41 | 6.54 |

Total solids  mass = 15.21 (gm)  density = 3.41 (gm/cc)
G = -213821.58 (J)  H = -169329.14 (J)  S = 33.88 (J/K)  V = 4.46 (cc)  Cp = 17.85 (J/K)

Viscosity of the System: 6.12 (log 10 poise)

System  mass = 99.97 (gm)  density = 2.61 (gm/cc)
G = -1595406.44 (J)  H = -1264304.01 (J)  S = 252.14 (J/K)  V = 38.37 (cc)  Cp = 132.17 (J/K)

Oxygen  delta moles = -0.00102186  delta grams = -0.0326984
G = 305.24 (J)  H = -34.54 (J)  S = -0.26 (J/K)  V = -111.57 (cc)  Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1030.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -9.77  delta HM = -4.95  NNO = 0.00  QFM = 0.10  COH = 1.78  IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid  mass = 81.55 (gm)  density = 2.50 (gm/cc)  viscosity = 6.01 (log 10 poise)  (analysis in wt %)
G = -1328789.29 (J)  H = -1056093.77 (J)  S = 209.26 (J/K)  V = 32.67 (cc)  Cp = 109.85 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.12 | 0.96 | 18.80 | 0.54 | 0.00 | 2.62 | 0.07 | 0.48 | 0.00 | 0.00 | 1.54 | 2.74 | 4.76 | 0.11 | 1.23 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 14.71 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)

opx Na0.00Ca0.02Fe"0.87Mg0.98Fe'"0.04Ti0.00Al0.21Si1.87O6
G = -202347.32 (J) H = -160098.52 (J) S = 32.42 (J/K) V = 4.20 (cc) Cp = 17.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.12 | 97.52 | 86.70 | 8.71 | -8.24 | 12.03 | 0.39 |

feldspar mass = 3.70 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -61693.97 (J) H = -50260.65 (J) S = 8.77 (J/K) V = 1.42 (cc) Cp = 4.54 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.67 | 25.37 | 6.96 |

Total solids mass = 18.41 (gm) density = 3.28 (gm/cc)
G = -264041.28 (J) H = -210359.17 (J) S = 41.19 (J/K) V = 5.62 (cc) Cp = 21.69 (J/K)

Viscosity of the System: 6.31 (log 10 poise)

System mass = 99.96 (gm) density = 2.61 (gm/cc)
G = -1592830.57 (J) H = -1266452.94 (J) S = 250.45 (J/K) V = 38.29 (cc) Cp = 131.54 (J/K)

Oxygen delta moles = -0.00113811 delta grams = -0.0364183
G = 337.08 (J) H = -38.06 (J) S = -0.29 (J/K) V = -123.31 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1020.00 (C) P = 7.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.10 COH = 1.76 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 78.57 (gm) density = 2.49 (gm/cc) viscosity = 6.13 (log 10 poise) (analysis in wt %)
G = -1279805.43 (J) H = -1020020.61 (J) S = 200.89 (J/K) V = 31.52 (cc) Cp = 105.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.40 | 1.00 | 18.76 | 0.51 | 0.00 | 2.45 | 0.08 | 0.44 | 0.00 | 0.00 | 1.46 | 2.61 | 4.90 | 0.12 | 1.28 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 15.32 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.89Mg0.96Fe'"0.04Ti0.00Al0.21Si1.87O6
G = -209439.81 (J) H = -166018.56 (J) S = 33.58 (J/K) V = 4.36 (cc) Cp = 17.81 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.33 | 97.67 | 88.64 | 8.86 | -8.38 | 12.16 | 0.38 |

feldspar mass = 6.07 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.24Al1.24Si2.76O8
G = -101028.54 (J) H = -82484.69 (J) S = 14.34 (J/K) V = 2.33 (cc) Cp = 7.44 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.16 | 24.47 | 7.37 |

Total solids mass = 21.39 (gm) density = 3.20 (gm/cc)
G = -310468.36 (J) H = -248503.25 (J) S = 47.92 (J/K) V = 6.69 (cc) Cp = 25.25 (J/K)

Viscosity of the System: 6.50 (log 10 poise)

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1590273.78 (J) H = -1268523.86 (J) S = 248.81 (J/K) V = 38.21 (cc) Cp = 130.95 (J/K)

Oxygen delta moles = -0.00125003 delta grams = -0.0399994
G = 367.07 (J) H = -41.35 (J) S = -0.32 (J/K) V = -134.40 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1010.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.09 COH = 1.73 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 75.82 (gm) density = 2.49 (gm/cc) viscosity = 6.24 (log 10 poise) (analysis in wt %)
G = -1234507.69 (J) H = -986674.79 (J) S = 193.14 (J/K) V = 30.46 (cc) Cp = 101.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.67 | 1.03 | 18.73 | 0.48 | 0.00 | 2.28 | 0.08 | 0.41 | 0.00 | 0.00 | 1.38 | 2.47 | 5.03 | 0.12 | 1.33 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 15.87 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.90Mg0.95Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -215792.37 (J) H = -171390.86 (J) S = 34.60 (J/K) V = 4.50 (cc) Cp = 18.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.31 | 97.80 | 90.38 | 9.02 | -8.52 | 12.27 | 0.37 |

feldspar mass = 8.27 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.24Al1.24Si2.76O8
G = -137435.86 (J) H = -112455.06 (J) S = 19.47 (J/K) V = 3.18 (cc) Cp = 10.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.55 | 23.67 | 7.78 |

Total solids mass = 24.14 (gm) density = 3.14 (gm/cc)
G = -353228.24 (J) H = -283845.91 (J) S = 54.07 (J/K) V = 7.68 (cc) Cp = 28.54 (J/K)

Viscosity of the System: 6.69 (log 10 poise)

System mass = 99.96 (gm) density = 2.62 (gm/cc)
G = -1587735.93 (J) H = -1270520.71 (J) S = 247.22 (J/K) V = 38.14 (cc) Cp = 130.41 (J/K)

Oxygen delta moles = -0.00135701 delta grams = -0.0434228
G = 395.06 (J) H = -44.41 (J) S = -0.34 (J/K) V = -144.77 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 1000.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.22 delta HM = -4.97 NNO = 0.00 QFM = 0.08 COH = 1.71 IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid mass = 73.27 (gm) density = 2.49 (gm/cc) viscosity = 6.36 (log 10 poise) (analysis in wt %)
G = -1192720.71 (J) H = -955936.46 (J) S = 185.98 (J/K) V = 29.47 (cc) Cp = 98.35 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.93 1.07 18.70 0.44 0.00 2.11 0.08 0.38 0.00 0.00 1.32 2.33 5.15 0.12 1.37 0.00 0.00 0.00 0.00

orthopyroxene mass = 16.37 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.92Mg0.93Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -221456.87 (J) H = -176253.28 (J) S = 35.51 (J/K) V = 4.64 (cc) Cp = 18.94 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.07 97.92 91.92 9.17 -8.67 12.37 0.36

feldspar mass = 10.31 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -171039.14 (J) H = -140258.39 (J) S = 24.18 (J/K) V = 3.96 (cc) Cp = 12.62 (J/K)
albite anorthite sanidine
68.84 22.98 8.18

Total solids mass = 26.68 (gm) density = 3.10 (gm/cc)
G = -392496.01 (J) H = -316511.67 (J) S = 59.68 (J/K) V = 8.60 (cc) Cp = 31.56 (J/K)

Viscosity of the System: 6.88 (log 10 poise)

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1585216.72 (J) H = -1272448.13 (J) S = 245.67 (J/K) V = 38.07 (cc) Cp = 129.90 (J/K)

Oxygen delta moles = -0.00145873 delta grams = -0.0466775
G = 420.99 (J) H = -47.21 (J) S = -0.37 (J/K) V = -154.41 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 990.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.38 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.68 IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 70.94 (gm) density = 2.48 (gm/cc) viscosity = 6.47 (log 10 poise) (analysis in wt %)
G = -1154233.83 (J) H = -927657.20 (J) S = 179.37 (J/K) V = 28.57 (cc) Cp = 95.10 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
67.17 1.10 18.67 0.41 0.00 1.95 0.09 0.35 0.00 0.00 1.26 2.19 5.27 0.13 1.42 0.00 0.00 0.00 0.00

orthopyroxene mass = 16.82 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.93Mg0.92Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -226489.67 (J) H = -180646.95 (J) S = 36.29 (J/K) V = 4.75 (cc) Cp = 19.41 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-104.63 98.03 93.29 9.32 -8.81 12.45 0.35

feldspar mass = 12.19 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -201992.30 (J) H = -166007.03 (J) S = 28.49 (J/K) V = 4.69 (cc) Cp = 14.92 (J/K)
albite anorthite sanidine
69.05 22.37 8.58

Total solids mass = 29.01 (gm) density = 3.07 (gm/cc)
G = -428481.97 (J) H = -346653.98 (J) S = 64.78 (J/K) V = 9.44 (cc) Cp = 34.33 (J/K)

Viscosity of the System: 7.07 (log 10 poise)

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1582715.80 (J) H = -1274311.18 (J) S = 244.16 (J/K) V = 38.01 (cc) Cp = 129.44 (J/K)

Oxygen delta moles = -0.00155503 delta grams = -0.049759
G = 444.86 (J) H = -49.77 (J) S = -0.39 (J/K) V = -163.31 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 980.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = 0.07 COH = 1.66 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 68.79 (gm) density = 2.48 (gm/cc) viscosity = 6.59 (log 10 poise) (analysis in wt %)
G = -1118815.64 (J) H = -901671.11 (J) S = 173.28 (J/K) V = 27.73 (cc) Cp = 92.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.40 | 1.13 | 18.64 | 0.38 | 0.00 | 1.80 | 0.09 | 0.32 | 0.00 | 0.00 | 1.20 | 2.05 | 5.39 | 0.13 | 1.46 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.23 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.94Mg0.91Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -230948.74 (J) H = -184614.19 (J) S = 36.97 (J/K) V = 4.86 (cc) Cp = 19.84 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.01 | 98.13 | 94.50 | 9.47 | -8.95 | 12.52 | 0.34 |

feldspar mass = 13.93 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.22Al1.22Si2.78O8
G = -230468.37 (J) H = -189829.75 (J) S = 32.43 (J/K) V = 5.36 (cc) Cp = 17.03 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.19 | 21.84 | 8.97 |

Total solids mass = 31.16 (gm) density = 3.05 (gm/cc)
G = -461417.11 (J) H = -374443.94 (J) S = 69.40 (J/K) V = 10.22 (cc) Cp = 36.87 (J/K)

Viscosity of the System: 7.26 (log 10 poise)

System mass = 99.95 (gm) density = 2.63 (gm/cc)
G = -1580232.75 (J) H = -1276115.05 (J) S = 242.68 (J/K) V = 37.95 (cc) Cp = 129.00 (J/K)

Oxygen delta moles = -0.00164594 delta grams = -0.0526682
G = 466.73 (J) H = -52.09 (J) S = -0.41 (J/K) V = -171.49 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 970.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = 0.06 COH = 1.64 IW

= 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 66.82 (gm) density = 2.48 (gm/cc) viscosity = 6.70 (log 10 poise) (analysis in wt %)
G = -1086226.47 (J) H = -877804.33 (J) S = 167.66 (J/K) V = 26.96 (cc) Cp = 89.39 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.62 | 1.17 | 18.62 | 0.35 | 0.00 | 1.65 | 0.09 | 0.30 | 0.00 | 0.00 | 1.15 | 1.92 | 5.49 | 0.14 | 1.51 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 17.59 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.96Mg0.89Fe"'0.03Ti0.00Al0.23Si1.87O6
G = -234891.32 (J) H = -188196.85 (J) S = 37.56 (J/K) V = 4.95 (cc) Cp = 20.22 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.24 | 98.22 | 95.57 | 9.63 | -9.10 | 12.59 | 0.33 |

feldspar mass = 15.54 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.09Na0.69Ca0.21Al1.21Si2.79O8
G = -256649.37 (J) H = -211863.73 (J) S = 36.03 (J/K) V = 5.98 (cc) Cp = 18.98 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.27 | 21.37 | 9.36 |

Total solids mass = 33.13 (gm) density = 3.03 (gm/cc)
G = -491540.68 (J) H = -400060.58 (J) S = 73.59 (J/K) V = 10.93 (cc) Cp = 39.20 (J/K)

Viscosity of the System: 7.45 (log 10 poise)

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1577767.15 (J) H = -1277864.92 (J) S = 241.24 (J/K) V = 37.90 (cc) Cp = 128.59 (J/K)

Oxygen delta moles = -0.0017316 delta grams = -0.0554092
G = 486.66 (J) H = -54.18 (J) S = -0.44 (J/K) V = -178.98 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 960.00 (C) P = 7.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = 0.05 COH = 1.61 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 65.00 (gm) density = 2.48 (gm/cc) viscosity = 6.82 (log 10 poise) (analysis in wt %)
G = -1056205.69 (J) H = -855861.13 (J) S = 162.47 (J/K) V = 26.25 (cc) Cp = 86.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.86 | 1.20 | 18.56 | 0.33 | 0.00 | 1.51 | 0.09 | 0.28 | 0.00 | 0.00 | 1.11 | 1.79 | 5.59 | 0.14 | 1.55 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.21 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.60Mg0.34)3Al2Si3O12
G = -2953.77 (J) H = -2406.64 (J) S = 0.44 (J/K) V = 0.05 (cc) Cp = 0.24 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.50 | 6.86 | 33.64 |

orthopyroxene mass = 17.75 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.96Mg0.89Fe'"0.03Ti0.00Al0.23Si1.87O6
G = -236266.72 (J) H = -189754.14 (J) S = 37.72 (J/K) V = 4.99 (cc) Cp = 20.38 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -108.14 | 98.30 | 96.40 | 9.73 | -9.19 | 12.58 | 0.32 |

feldspar mass = 16.97 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.69Ca0.21Al1.21Si2.79O8
G = -279887.05 (J) H = -231557.72 (J) S = 39.19 (J/K) V = 6.53 (cc) Cp = 20.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.34 | 20.89 | 9.78 |

Total solids mass = 34.94 (gm) density = 3.02 (gm/cc)
G = -519107.53 (J) H = -423718.50 (J) S = 77.35 (J/K) V = 11.58 (cc) Cp = 41.33 (J/K)

Viscosity of the System: 7.64 (log 10 poise)

System mass = 99.94 (gm) density = 2.64 (gm/cc)
G = -1575313.22 (J) H = -1279579.62 (J) S = 239.82 (J/K) V = 37.84 (cc) Cp = 128.20 (J/K)

Oxygen delta moles = -0.0018222 delta grams = -0.0583082
G = 507.55 (J) H = -56.36 (J) S = -0.46 (J/K) V = -186.83 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 950.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.02 delta HM = -5.00 NNO = 0.00 QFM = 0.04 COH = 1.58 IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid mass = 63.31 (gm) density = 2.47 (gm/cc) viscosity = 6.95 (log 10 poise) (analysis in wt %)
G = -1028169.82 (J) H = -835363.38 (J) S = 157.63 (J/K) V = 25.61 (cc) Cp = 84.47 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.29 | 1.23 | 18.29 | 0.30 | 0.00 | 1.36 | 0.10 | 0.26 | 0.00 | 0.00 | 1.07 | 1.70 | 5.68 | 0.14 | 1.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 1.81 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.60Mg0.34)3Al2Si3O12
G = -24930.26 (J) H = -20360.94 (J) S = 3.74 (J/K) V = 0.46 (cc) Cp = 2.00 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.69 | 6.80 | 33.51 |

orthopyroxene mass = 16.82 (gm) density = 3.56 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.96Mg0.89Fe'"0.03Ti0.00Al0.22Si1.87O6
G = -223630.18 (J) H = -180109.28 (J) S = 35.58 (J/K) V = 4.73 (cc) Cp = 19.30 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -107.65 | 98.34 | 96.31 | 9.51 | -8.96 | 12.14 | 0.32 |

feldspar mass = 17.99 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -296113.48 (J) H = -245506.81 (J) S = 41.37 (J/K) V = 6.93 (cc) Cp = 21.93 (J/K)

albite anorthite sanidine
69.62 19.95 10.43

Total solids mass = 36.62 (gm) density = 3.02 (gm/cc)
G = -544673.93 (J) H = -445977.03 (J) S = 80.69 (J/K) V = 12.12 (cc) Cp = 43.23 (J/K)

Viscosity of the System: 7.84 (log 10 poise)

System mass = 99.94 (gm) density = 2.65 (gm/cc)
G = -1572843.74 (J) H = -1281340.41 (J) S = 238.32 (J/K) V = 37.73 (cc) Cp = 127.70 (J/K)

Oxygen delta moles = -0.00196948 delta grams = -0.0630211
G = 543.64 (J) H = -60.22 (J) S = -0.49 (J/K) V = -200.29 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 940.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = 0.03 COH = 1.56 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 60.50 (gm) density = 2.47 (gm/cc) viscosity = 7.03 (log 10 poise) (analysis in wt %)
G = -982003.97 (J) H = -799788.71 (J) S = 150.20 (J/K) V = 24.52 (cc) Cp = 80.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.59 | 1.16 | 18.12 | 0.27 | 0.00 | 1.20 | 0.10 | 0.25 | 0.00 | 0.00 | 1.03 | 1.63 | 5.84 | 0.15 | 1.66 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.98 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.59Mg0.34)3Al2Si3O12
G = -54597.33 (J) H = -44705.80 (J) S = 8.15 (J/K) V = 1.01 (cc) Cp = 4.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 59.48 | 6.76 | 33.76 |

orthopyroxene mass = 15.32 (gm) density = 3.55 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.95Mg0.91Fe'"0.03Ti0.00Al0.21Si1.88O6
G = -204066.39 (J) H = -164881.93 (J) S = 32.30 (J/K) V = 4.32 (cc) Cp = 17.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -106.04 | 98.35 | 95.23 | 9.22 | -8.71 | 11.64 | 0.32 |

feldspar mass = 19.15 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.12Na0.70Ca0.19Al1.19Si2.81O8
G = -314552.03 (J) H = -261341.45 (J) S = 43.86 (J/K) V = 7.38 (cc) Cp = 23.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.55 | 18.90 | 11.55 |

quartz mass = 0.81 (gm) density = 2.56 (gm/cc)
SiO2
G = -13424.08 (J) H = -11294.17 (J) S = 1.76 (J/K) V = 0.32 (cc) Cp = 0.96 (J/K)

rhm-oxide mass = 0.17 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.11Fe'"0.16Al0.19Ti0.82O3
G = -1757.31 (J) H = -1351.44 (J) S = 0.33 (J/K) V = 0.04 (cc) Cp = 0.17 (J/K)

geikielite hematite ilmenite pyrophanite corundum
11.23 8.02 69.55 1.62 9.59

Total solids mass = 39.43 (gm) density = 3.02 (gm/cc)
G = -588397.14 (J) H = -483574.79 (J) S = 86.41 (J/K) V = 13.06 (cc) Cp = 46.43 (J/K)

Viscosity of the System: 8.06 (log 10 poise)

System mass = 99.93 (gm) density = 2.66 (gm/cc)
G = -1570401.11 (J) H = -1283363.50 (J) S = 236.61 (J/K) V = 37.59 (cc) Cp = 127.06 (J/K)

Oxygen delta moles = -0.00209607 delta grams = -0.0670717
G = 573.33 (J) H = -63.34 (J) S = -0.52 (J/K) V = -211.42 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 930.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = 0.02 COH = 1.53 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 56.89 (gm) density = 2.46 (gm/cc) viscosity = 7.05 (log 10 poise) (analysis in wt %)
G = -922709.01 (J) H = -753056.11 (J) S = 141.01 (J/K) V = 23.11 (cc) Cp = 75.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.63 | 1.13 | 18.03 | 0.24 | 0.00 | 1.06 | 0.10 | 0.25 | 0.00 | 0.00 | 1.00 | 1.58 | 6.07 | 0.16 | 1.77 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 6.58 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.59Mg0.34)3Al2Si3O12
G = -90411.81 (J) H = -74231.53 (J) S = 13.45 (J/K) V = 1.67 (cc) Cp = 7.26 (J/K)
almandine grossular pyrope
59.03 6.75 34.23

orthopyroxene mass = 13.50 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.94Mg0.93Fe"'0.03Ti0.00Al0.20Si1.88O6
G = -180272.65 (J) H = -146157.73 (J) S = 28.35 (J/K) V = 3.81 (cc) Cp = 15.53 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-103.80 98.34 93.53 8.93 -8.42 11.11 0.32

feldspar mass = 20.37 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.13Na0.69Ca0.18Al1.18Si2.82O8
G = -333829.39 (J) H = -277927.31 (J) S = 46.46 (J/K) V = 7.86 (cc) Cp = 24.77 (J/K)
albite anorthite sanidine
69.12 17.70 13.18

quartz mass = 2.28 (gm) density = 2.56 (gm/cc)
SiO2
G = -37553.17 (J) H = -31663.01 (J) S = 4.90 (J/K) V = 0.89 (cc) Cp = 2.69 (J/K)

rhm-oxide mass = 0.31 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe"'0.15Al0.19Ti0.83O3
G = -3197.03 (J) H = -2467.44 (J) S = 0.61 (J/K) V = 0.07 (cc) Cp = 0.30 (J/K)

geikielite hematite ilmenite pyrophanite corundum
11.59 7.69 69.64 1.77 9.31

Total solids mass = 43.04 (gm) density = 3.01 (gm/cc)
G = -645264.05 (J) H = -532447.02 (J) S = 93.77 (J/K) V = 14.30 (cc) Cp = 50.54 (J/K)

Viscosity of the System: 8.31 (log 10 poise)

System mass = 99.93 (gm) density = 2.67 (gm/cc)
G = -1567973.06 (J) H = -1285503.14 (J) S = 234.78 (J/K) V = 37.41 (cc) Cp = 126.35 (J/K)

Oxygen delta moles = -0.00222953 delta grams = -0.0713422
G = 604.25 (J) H = -66.58 (J) S = -0.56 (J/K) V = -223.03 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 920.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = 0.02 COH = 1.50 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 53.45 (gm) density = 2.46 (gm/cc) viscosity = 7.07 (log 10 poise) (analysis in wt %)
G = -866265.32 (J) H = -708420.30 (J) S = 132.29 (J/K) V = 21.75 (cc) Cp = 71.21 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.65 | 1.09 | 17.94 | 0.22 | 0.00 | 0.94 | 0.11 | 0.24 | 0.00 | 0.00 | 0.98 | 1.53 | 6.27 | 0.17 | 1.88 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.98 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.59Mg0.35)3Al2Si3O12
G = -123349.74 (J) H = -101550.36 (J) S = 18.27 (J/K) V = 2.28 (cc) Cp = 9.90 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.51 | 6.77 | 34.71 |

orthopyroxene mass = 11.81 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.92Mg0.96Fe'"0.02Ti0.00Al0.20Si1.89O6
G = -158188.57 (J) H = -128697.95 (J) S = 24.72 (J/K) V = 3.34 (cc) Cp = 13.60 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -101.39 | 98.33 | 91.68 | 8.62 | -8.13 | 10.58 | 0.32 |

feldspar mass = 21.61 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.15Na0.68Ca0.16Al1.16Si2.84O8
G = -353289.39 (J) H = -294729.34 (J) S = 49.08 (J/K) V = 8.35 (cc) Cp = 26.24 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.38 | 16.49 | 15.13 |

quartz mass = 3.64 (gm) density = 2.56 (gm/cc)
SiO2
G = -59975.49 (J) H = -50677.23 (J) S = 7.79 (J/K) V = 1.42 (cc) Cp = 4.29 (J/K)

rhm-oxide mass = 0.44 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.15Al0.18Ti0.84O3
G = -4504.47 (J) H = -3489.03 (J) S = 0.85 (J/K) V = 0.10 (cc) Cp = 0.42 (J/K)

geikielite hematite ilmenite pyrophanite corundum
11.97 7.37 69.69 1.92 9.04

Total solids mass = 46.48 (gm) density = 3.00 (gm/cc)
G = -699307.66 (J) H = -579143.91 (J) S = 100.71 (J/K) V = 15.49 (cc) Cp = 54.46 (J/K)

Viscosity of the System: 8.62 (log 10 poise)

System mass = 99.92 (gm) density = 2.68 (gm/cc)
G = -1565572.98 (J) H = -1287564.21 (J) S = 233.00 (J/K) V = 37.24 (cc) Cp = 125.67 (J/K)

Oxygen delta moles = -0.00234442 delta grams = -0.0750187
G = 629.53 (J) H = -69.17 (J) S = -0.59 (J/K) V = -232.57 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 910.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = 0.01 COH = 1.48 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 50.08 (gm) density = 2.45 (gm/cc) viscosity = 7.07 (log 10 poise) (analysis in wt %)
G = -811059.55 (J) H = -664566.74 (J) S = 123.82 (J/K) V = 20.42 (cc) Cp = 66.72 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.66 | 1.05 | 17.84 | 0.19 | 0.00 | 0.83 | 0.11 | 0.24 | 0.00 | 0.00 | 0.96 | 1.49 | 6.43 | 0.18 | 2.01 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 11.23 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.58Mg0.35)3Al2Si3O12
G = -154340.50 (J) H = -127413.57 (J) S = 22.76 (J/K) V = 2.86 (cc) Cp = 12.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.91 | 6.85 | 35.24 |

orthopyroxene mass = 10.21 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.90Mg0.98Fe'"0.02Ti0.00Al0.19Si1.89O6
G = -137252.58 (J) H = -112058.08 (J) S = 21.29 (J/K) V = 2.89 (cc) Cp = 11.78 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -98.75 | 98.29 | 89.61 | 8.31 | -7.82 | 10.04 | 0.32 |

feldspar mass = 22.91 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.18Na0.67Ca0.15Al1.15Si2.85O8
G = -373584.89 (J) H = -312291.89 (J) S = 51.80 (J/K) V = 8.86 (cc) Cp = 27.78 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.25 | 15.23 | 17.52 |

quartz mass = 4.94 (gm) density = 2.56 (gm/cc)
SiO2
G = -81238.25 (J) H = -68790.82 (J) S = 10.52 (J/K) V = 1.93 (cc) Cp = 5.82 (J/K)

rhm-oxide mass = 0.56 (gm) density = 4.57 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.70Mg0.12Fe'"0.14Al0.18Ti0.84O3
G = -5722.95 (J) H = -4448.94 (J) S = 1.08 (J/K) V = 0.12 (cc) Cp = 0.54 (J/K)

geikielite hematite ilmenite pyrophanite corundum
12.40 7.04 69.69 2.08 8.79

Total solids mass = 49.84 (gm) density = 2.99 (gm/cc)
G = -752139.17 (J) H = -625003.31 (J) S = 107.46 (J/K) V = 16.67 (cc) Cp = 58.29 (J/K)

Viscosity of the System: 9.06 (log 10 poise)

System mass = 99.92 (gm) density = 2.69 (gm/cc)
G = -1563198.71 (J) H = -1289570.06 (J) S = 231.27 (J/K) V = 37.09 (cc) Cp = 125.01 (J/K)

Oxygen delta moles = -0.00244386 delta grams = -0.0782005
G = 650.13 (J) H = -71.24 (J) S = -0.61 (J/K) V = -240.40 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 900.00 (C) P = 7.000 (kbars) log(10) f O2 = -11.89 delta HM = -5.04 NNO = 0.00 QFM = -0.00 COH = 1.45 IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid mass = 46.42 (gm) density = 2.45 (gm/cc) viscosity = 7.04 (log 10 poise) (analysis in wt %)
G = -751519.38 (J) H = -616879.96 (J) S = 114.77 (J/K) V = 18.97 (cc) Cp = 61.87 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.67 1.01 17.75 0.18 0.00 0.74 0.11 0.24 0.00 0.00 0.97 1.48 6.50 0.20 2.17 0.00 0.00 0.00 0.00

garnet mass = 13.47 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.57Mg0.36)3Al2Si3O12
G = -185330.20 (J) H = -153426.23 (J) S = 27.20 (J/K) V = 3.43 (cc) Cp = 14.85 (J/K)
almandine grossular pyrope
57.17 6.96 35.87

orthopyroxene mass = 8.59 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.87Mg1.01Fe'"0.02Ti0.00Al0.18Si1.90O6
G = -116104.21 (J) H = -95136.44 (J) S = 17.87 (J/K) V = 2.44 (cc) Cp = 9.94 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-95.71 98.24 87.16 7.98 -7.50 9.50 0.33

feldspar mass = 23.12 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.19Na0.66Ca0.14Al1.14Si2.86O8
G = -375999.12 (J) H = -314970.85 (J) S = 52.02 (J/K) V = 8.95 (cc) Cp = 27.99 (J/K)
albite anorthite sanidine
66.31 14.36 19.33

feldspar mass = 1.38 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.51Na0.45Ca0.04Al1.04Si2.96O8
G = -22014.10 (J) H = -18413.92 (J) S = 3.07 (J/K) V = 0.54 (cc) Cp = 1.64 (J/K)
albite anorthite sanidine
44.73 4.36 50.91

quartz mass = 6.26 (gm) density = 2.56 (gm/cc)

SiO2
G = -102903.83 (J)  H = -87323.25 (J)  S = 13.28 (J/K)  V = 2.45 (cc)  Cp = 7.37 (J/K)

rhm-oxide  mass = 0.68 (gm)  density = 4.56 (gm/cc)  (analysis in mole %)
Mn0.02Fe"0.70Mg0.13Fe'"0.13Al0.17Ti0.85O3
G = -6977.40 (J)  H = -5444.37 (J)  S = 1.31 (J/K)  V = 0.15 (cc)  Cp = 0.65 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.90 | 6.69 | 69.60 | 2.24 | 8.57 |

Total solids  mass = 53.50 (gm)  density = 2.98 (gm/cc)
G = -809328.86 (J)  H = -674715.04 (J)  S = 114.75 (J/K)  V = 17.96 (cc)  Cp = 62.44 (J/K)

Viscosity of the System: 10.18 (log 10 poise)

System  mass = 99.92 (gm)  density = 2.71 (gm/cc)
G = -1560848.24 (J)  H = -1291595.00 (J)  S = 229.51 (J/K)  V = 36.93 (cc)  Cp = 124.32 (J/K)

Oxygen  delta moles = -0.00253115  delta grams = -0.0809938
G = 667.04 (J)  H = -72.88 (J)  S = -0.63 (J/K)  V = -246.89 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 890.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.07  delta HM = -5.05  NNO = 0.00  QFM = -0.01  COH = 1.42
IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid  mass = 42.39 (gm)  density = 2.44 (gm/cc)  viscosity = 6.98 (log 10 poise)  (analysis in wt %)
G = -686355.02 (J)  H = -564260.49 (J)  S = 104.97 (J/K)  V = 17.36 (cc)  Cp = 56.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.68 | 0.96 | 17.65 | 0.16 | 0.00 | 0.66 | 0.12 | 0.24 | 0.00 | 0.00 | 0.98 | 1.52 | 6.45 | 0.21 | 2.37 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 15.65 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.56Mg0.37)3Al2Si3O12
G = -215721.23 (J)  H = -179094.25 (J)  S = 31.49 (J/K)  V = 4.00 (cc)  Cp = 17.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.30 | 7.05 | 36.65 |

orthopyroxene  mass = 7.00 (gm)  density = 3.51 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.84Mg1.04Fe'"0.02Ti0.00Al0.17Si1.91O6
G = -95068.11 (J)  H = -78190.20 (J)  S = 14.51 (J/K)  V = 2.00 (cc)  Cp = 8.11 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.32 | 98.19 | 84.35 | 7.67 | -7.19 | 8.96 | 0.34 |

feldspar  mass = 20.60 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)
K0.18Na0.67Ca0.15Al1.15Si2.85O8
G = -334828.87 (J)  H = -281144.37 (J)  S = 46.15 (J/K)  V = 7.97 (cc)  Cp = 24.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.01 | 14.74 | 18.25 |

feldspar  mass = 5.82 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)

K0.53Na0.43Ca0.04Al1.04Si2.96O8
G = -92885.65 (J)  H = -77871.78 (J)  S = 12.91 (J/K)  V = 2.29 (cc)  Cp = 6.95 (J/K)
albite  anorthite  sanidine
43.48  4.00  52.53

quartz  mass = 7.64 (gm)  density = 2.56 (gm/cc)
SiO2
G = -125354.13 (J)  H = -106601.37 (J)  S = 16.12 (J/K)  V = 2.99 (cc)  Cp = 8.98 (J/K)

rhm-oxide  mass = 0.81 (gm)  density = 4.56 (gm/cc)  (analysis in mole %)
Mn0.02Fe"0.69Mg0.13Fe'"0.13Al0.17Ti0.85O3
G = -8310.10 (J)  H = -6509.06 (J)  S = 1.55 (J/K)  V = 0.18 (cc)  Cp = 0.78 (J/K)
geikielite  hematite  ilmenite  pyrophanite  corundum
13.48  6.33  69.42  2.39  8.38

Total solids  mass = 57.52 (gm)  density = 2.96 (gm/cc)
G = -872168.09 (J)  H = -729411.05 (J)  S = 122.73 (J/K)  V = 19.41 (cc)  Cp = 67.02 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.72 (gm/cc)
G = -1558523.11 (J)  H = -1293671.54 (J)  S = 227.70 (J/K)  V = 36.78 (cc)  Cp = 123.58 (J/K)

Oxygen  delta moles = -0.00260491  delta grams = -0.0833539
G = 679.99 (J)  H = -74.08 (J)  S = -0.65 (J/K)  V = -251.91 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 880.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -12.26  delta HM = -5.06  NNO = 0.00  QFM = -0.02  COH = 1.39
IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid  mass = 38.86 (gm)  density = 2.44 (gm/cc)  viscosity = 6.92 (log 10 poise)  (analysis in wt %)
G = -629107.67 (J)  H = -517973.09 (J)  S = 96.37 (J/K)  V = 15.95 (cc)  Cp = 51.90 (J/K)
SiO2  TiO2  Al2O3  Fe2O3  Cr2O3  FeO  MnO  MgO  NiO  CoO  CaO  Na2O  K2O  P2O5  H2O
CO2  SO3 Cl2O-1  F2O-1
68.67  0.91  17.55  0.15  0.00  0.59  0.13  0.24  0.00  0.00  1.00  1.56  6.38  0.23  2.59  0.00  0.00  0.00
0.00

garnet  mass = 17.52 (gm)  density = 3.91 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.55Mg0.37)3Al2Si3O12
G = -241763.16 (J)  H = -201278.71 (J)  S = 35.11 (J/K)  V = 4.48 (cc)  Cp = 19.34 (J/K)
almandine  grossular  pyrope
55.49  7.12  37.39

orthopyroxene  mass = 5.64 (gm)  density = 3.49 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.82Mg1.07Fe'"0.02Ti0.00Al0.16Si1.91O6
G = -77003.74 (J)  H = -63564.37 (J)  S = 11.65 (J/K)  V = 1.61 (cc)  Cp = 6.55 (J/K)
diopside clinoenstatit  hedenbergite alumino-buffo  buffonite  essenite  jadeite
-89.08  98.14  81.63  7.37  -6.89  8.47  0.34

feldspar  mass = 18.83 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)

K0.17Na0.68Ca0.15Al1.15Si2.85O8
G = -305770.91 (J) H = -257346.08 (J) S = 41.99 (J/K) V = 7.28 (cc) Cp = 22.79 (J/K)
albite anorthite sanidine
67.67 15.04 17.29

feldspar mass = 9.30 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.54Na0.42Ca0.04Al1.04Si2.96O8
G = -147986.62 (J) H = -124348.49 (J) S = 20.50 (J/K) V = 3.66 (cc) Cp = 11.08 (J/K)
albite anorthite sanidine
42.33 3.68 54.00

quartz mass = 8.86 (gm) density = 2.56 (gm/cc)
SiO2
G = -145150.91 (J) H = -123699.26 (J) S = 18.60 (J/K) V = 3.46 (cc) Cp = 10.40 (J/K)

rhm-oxide mass = 0.92 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.14Fe'"0.12Al0.16Ti0.86O3
G = -9440.34 (J) H = -7422.20 (J) S = 1.75 (J/K) V = 0.20 (cc) Cp = 0.88 (J/K)
geikielite hematite ilmenite pyrophanite corundum
14.05 6.00 69.22 2.53 8.20

Total solids mass = 61.06 (gm) density = 2.95 (gm/cc)
G = -927115.68 (J) H = -777659.11 (J) S = 129.61 (J/K) V = 20.69 (cc) Cp = 71.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.73 (gm/cc)
G = -1556223.35 (J) H = -1295632.20 (J) S = 225.98 (J/K) V = 36.64 (cc) Cp = 122.93 (J/K)

Oxygen delta moles = -0.00266416 delta grams = -0.0852498
G = 688.83 (J) H = -74.82 (J) S = -0.66 (J/K) V = -255.43 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 870.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.03 COH = 1.36 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 35.72 (gm) density = 2.43 (gm/cc) viscosity = 6.84 (log 10 poise) (analysis in wt %)
G = -578317.37 (J) H = -476847.31 (J) S = 88.76 (J/K) V = 14.70 (cc) Cp = 47.77 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.64 0.85 17.46 0.13 0.00 0.53 0.13 0.24 0.00 0.00 1.01 1.61 6.32 0.25 2.82 0.00 0.00 0.00 0.00

garnet mass = 19.13 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.55Mg0.38)3Al2Si3O12
G = -264306.69 (J) H = -220657.98 (J) S = 38.18 (J/K) V = 4.89 (cc) Cp = 21.12 (J/K)
almandine grossular pyrope
54.71 7.19 38.10

orthopyroxene mass = 4.47 (gm) density = 3.48 (gm/cc) (analysis in mole %)

opx Na0.00Ca0.02Fe"0.79Mg1.11Fe'''0.01Ti0.00Al0.15Si1.91O6
G = -61329.04 (J) H = -50806.67 (J) S = 9.20 (J/K) V = 1.28 (cc) Cp = 5.20 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.95 | 98.10 | 78.99 | 7.09 | -6.60 | 8.02 | 0.35 |

feldspar mass = 17.55 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.68Ca0.15Al1.15Si2.85O8
G = -284717.81 (J) H = -240183.89 (J) S = 38.96 (J/K) V = 6.78 (cc) Cp = 21.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.29 | 15.28 | 16.43 |

feldspar mass = 12.09 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.55Na0.41Ca0.03Al1.03Si2.97O8
G = -192083.53 (J) H = -161768.63 (J) S = 26.52 (J/K) V = 4.76 (cc) Cp = 14.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.25 | 3.39 | 55.36 |

quartz mass = 9.94 (gm) density = 2.56 (gm/cc)
SiO2
G = -162787.08 (J) H = -139023.37 (J) S = 20.79 (J/K) V = 3.89 (cc) Cp = 11.67 (J/K)

rhm-oxide mass = 1.01 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.15Fe'''0.11Al0.16Ti0.86O3
G = -10404.72 (J) H = -8210.77 (J) S = 1.92 (J/K) V = 0.22 (cc) Cp = 0.97 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.60 | 5.69 | 69.01 | 2.67 | 8.02 |

Total solids mass = 64.19 (gm) density = 2.94 (gm/cc)
G = -975628.87 (J) H = -820651.30 (J) S = 135.57 (J/K) V = 21.82 (cc) Cp = 74.58 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.74 (gm/cc)
G = -1553946.24 (J) H = -1297498.61 (J) S = 224.33 (J/K) V = 36.52 (cc) Cp = 122.34 (J/K)

Oxygen delta moles = -0.00271248 delta grams = -0.086796
G = 694.59 (J) H = -75.22 (J) S = -0.67 (J/K) V = -257.81 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 860.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.04 COH = 1.33 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 32.91 (gm) density = 2.42 (gm/cc) viscosity = 6.76 (log 10 poise) (analysis in wt %)
G = -532854.86 (J) H = -439977.52 (J) S = 81.96 (J/K) V = 13.58 (cc) Cp = 44.07 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.58 | 0.80 | 17.37 | 0.12 | 0.00 | 0.48 | 0.14 | 0.24 | 0.00 | 0.00 | 1.02 | 1.66 | 6.24 | 0.28 | 3.06 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 20.53 (gm) density = 3.90 (gm/cc) (analysis in mole %)

(Ca0.07Fe"0.54Mg0.39)3Al2Si3O12
G = -284001.36 (J) H = -237750.51 (J) S = 40.82 (J/K) V = 5.26 (cc) Cp = 22.67 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.97 | 7.25 | 38.78 |

orthopyroxene mass = 3.45 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.76Mg1.13Fe'"0.01Ti0.00Al0.15Si1.92O6
G = -47599.84 (J) H = -39571.52 (J) S = 7.08 (J/K) V = 0.99 (cc) Cp = 4.02 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.94 | 98.07 | 76.43 | 6.82 | -6.33 | 7.60 | 0.36 |

feldspar mass = 16.61 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.69Ca0.15Al1.15Si2.85O8
G = -269218.14 (J) H = -227632.96 (J) S = 36.70 (J/K) V = 6.41 (cc) Cp = 20.09 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.88 | 15.47 | 15.65 |

feldspar mass = 14.39 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.57Na0.40Ca0.03Al1.03Si2.97O8
G = -228138.77 (J) H = -192569.96 (J) S = 31.39 (J/K) V = 5.66 (cc) Cp = 17.11 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.24 | 3.12 | 56.64 |

quartz mass = 10.93 (gm) density = 2.56 (gm/cc)
SiO2
G = -178645.25 (J) H = -152889.34 (J) S = 22.73 (J/K) V = 4.27 (cc) Cp = 12.81 (J/K)

rhm-oxide mass = 1.09 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.15Fe'"0.11Al0.16Ti0.87O3
G = -11231.53 (J) H = -8895.67 (J) S = 2.06 (J/K) V = 0.24 (cc) Cp = 1.04 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.15 | 5.40 | 68.79 | 2.80 | 7.86 |

Total solids mass = 67.00 (gm) density = 2.93 (gm/cc)
G = -1018834.89 (J) H = -859309.97 (J) S = 140.78 (J/K) V = 22.84 (cc) Cp = 77.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.74 (gm/cc)
G = -1551689.75 (J) H = -1299287.49 (J) S = 222.74 (J/K) V = 36.42 (cc) Cp = 121.81 (J/K)

Oxygen delta moles = -0.00275246 delta grams = -0.0880754
G = 698.00 (J) H = -75.35 (J) S = -0.68 (J/K) V = -259.32 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 850.00 (C) P = 7.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.05 COH = 1.30
IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 30.38 (gm) density = 2.42 (gm/cc) viscosity = 6.67 (log 10 poise) (analysis in wt %)
G = -491830.36 (J) H = -406649.75 (J) S = 75.84 (J/K) V = 12.56 (cc) Cp = 40.73 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.50 0.75 17.28 0.11 0.00 0.43 0.14 0.24 0.00 0.00 1.04 1.72 6.16 0.30 3.31 0.00 0.00 0.00 0.00

garnet mass = 21.76 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.53Mg0.39)3Al2Si3O12
G = -301351.82 (J) H = -252959.62 (J) S = 43.09 (J/K) V = 5.58 (cc) Cp = 24.04 (J/K)
almandine grossular pyrope
53.27 7.30 39.43

orthopyroxene mass = 2.56 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.74Mg1.16Fe'"0.01Ti0.00Al0.14Si1.92O6
G = -35471.05 (J) H = -29590.08 (J) S = 5.24 (J/K) V = 0.74 (cc) Cp = 2.99 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-80.05 98.04 73.93 6.57 -6.07 7.21 0.37

feldspar mass = 15.92 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.15Na0.69Ca0.16Al1.16Si2.84O8
G = -257712.92 (J) H = -218405.18 (J) S = 35.00 (J/K) V = 6.14 (cc) Cp = 19.25 (J/K)
albite anorthite sanidine
69.45 15.62 14.93

feldspar mass = 16.32 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.58Na0.39Ca0.03Al1.03Si2.97O8
G = -258114.88 (J) H = -218366.79 (J) S = 35.39 (J/K) V = 6.42 (cc) Cp = 19.38 (J/K)
albite anorthite sanidine
39.27 2.88 57.85

quartz mass = 11.82 (gm) density = 2.56 (gm/cc)
SiO2
G = -193028.24 (J) H = -165547.15 (J) S = 24.47 (J/K) V = 4.62 (cc) Cp = 13.85 (J/K)

rhm-oxide mass = 1.16 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.16Fe'"0.10Al0.15Ti0.87O3
G = -11943.09 (J) H = -9493.41 (J) S = 2.18 (J/K) V = 0.26 (cc) Cp = 1.10 (J/K)
geikielite hematite ilmenite pyrophanite corundum
15.69 5.13 68.56 2.92 7.70

Total solids mass = 69.53 (gm) density = 2.93 (gm/cc)
G = -1057621.99 (J) H = -894362.22 (J) S = 145.36 (J/K) V = 23.75 (cc) Cp = 80.60 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.75 (gm/cc)
G = -1549452.36 (J) H = -1301011.98 (J) S = 221.20 (J/K) V = 36.32 (cc) Cp = 121.33 (J/K)

Oxygen delta moles = -0.002786 delta grams = -0.0891486
G = 699.60 (J) H = -75.28 (J) S = -0.69 (J/K) V = -260.16 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 840.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.06 COH = 1.27

IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 28.07 (gm) density = 2.41 (gm/cc) viscosity = 6.56 (log 10 poise) (analysis in wt %)
G = -454530.47 (J) H = -376291.11 (J) S = 70.29 (J/K) V = 11.64 (cc) Cp = 37.70 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.39 | 0.70 | 17.20 | 0.10 | 0.00 | 0.39 | 0.15 | 0.24 | 0.00 | 0.00 | 1.06 | 1.78 | 6.07 | 0.32 | 3.59 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.85 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.53Mg0.40)3Al2Si3O12
G = -316756.57 (J) H = -266604.19 (J) S = 45.05 (J/K) V = 5.87 (cc) Cp = 25.24 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.59 | 7.34 | 40.06 |

orthopyroxene mass = 1.77 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.72Mg1.19Fe'''0.01Ti0.00Al0.14Si1.93O6
G = -24670.13 (J) H = -20649.62 (J) S = 3.61 (J/K) V = 0.51 (cc) Cp = 2.07 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.25 | 98.02 | 71.50 | 6.33 | -5.83 | 6.85 | 0.37 |

feldspar mass = 15.40 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.14Na0.70Ca0.16Al1.16Si2.84O8
G = -249162.12 (J) H = -211640.84 (J) S = 33.71 (J/K) V = 5.94 (cc) Cp = 18.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.01 | 15.73 | 14.26 |

feldspar mass = 17.95 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.59Na0.38Ca0.03Al1.03Si2.97O8
G = -283376.15 (J) H = -240281.08 (J) S = 38.71 (J/K) V = 7.06 (cc) Cp = 21.30 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.33 | 2.66 | 59.01 |

quartz mass = 12.64 (gm) density = 2.56 (gm/cc)
SiO2
G = -206180.25 (J) H = -177198.60 (J) S = 26.04 (J/K) V = 4.94 (cc) Cp = 14.79 (J/K)

rhm-oxide mass = 1.22 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.16Fe'''0.10Al0.15Ti0.88O3
G = -12557.20 (J) H = -10017.17 (J) S = 2.28 (J/K) V = 0.27 (cc) Cp = 1.16 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 16.22 | 4.87 | 68.32 | 3.03 | 7.55 |

Total solids mass = 71.84 (gm) density = 2.92 (gm/cc)
G = -1092702.42 (J) H = -926391.50 (J) S = 149.41 (J/K) V = 24.59 (cc) Cp = 83.19 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.76 (gm/cc)
G = -1547232.89 (J) H = -1302682.62 (J) S = 219.69 (J/K) V = 36.23 (cc) Cp = 120.89 (J/K)

Oxygen delta moles = -0.00281451 delta grams = -0.0900608

G = 699.79 (J)  H = -75.06 (J)  S = -0.70 (J/K)  V = -260.48 (cc)  Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 830.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -13.24  delta HM = -5.10  NNO = 0.00  QFM = -0.07  COH = 1.24
IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid  mass = 25.96 (gm)  density = 2.41 (gm/cc)  viscosity = 6.45 (log 10 poise)  (analysis in wt %)
G = -420373.16 (J)  H = -348433.65 (J)  S = 65.21 (J/K)  V = 10.79 (cc)  Cp = 34.93 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.25 | 0.66 | 17.12 | 0.09 | 0.00 | 0.35 | 0.16 | 0.24 | 0.00 | 0.00 | 1.08 | 1.85 | 5.98 | 0.35 | 3.88 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 23.83 (gm)  density = 3.89 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.52Mg0.41)3Al2Si3O12
G = -330535.25 (J)  H = -278940.42 (J)  S = 46.77 (J/K)  V = 6.12 (cc)  Cp = 26.32 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.95 | 7.38 | 40.67 |

orthopyroxene  mass = 1.07 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.69Mg1.22Fe'"0.01Ti0.00Al0.13Si1.93O6
G = -14978.34 (J)  H = -12579.06 (J)  S = 2.17 (J/K)  V = 0.31 (cc)  Cp = 1.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.56 | 98.01 | 69.14 | 6.11 | -5.59 | 6.51 | 0.38 |

feldspar  mass = 15.03 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.14Na0.71Ca0.16Al1.16Si2.84O8
G = -242845.45 (J)  H = -206744.19 (J)  S = 32.73 (J/K)  V = 5.79 (cc)  Cp = 18.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.56 | 15.81 | 13.63 |

feldspar  mass = 19.35 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)
K0.60Na0.37Ca0.02Al1.02Si2.98O8
G = -304907.88 (J)  H = -259123.11 (J)  S = 41.50 (J/K)  V = 7.61 (cc)  Cp = 22.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.43 | 2.46 | 60.12 |

quartz  mass = 13.40 (gm)  density = 2.56 (gm/cc)
SiO2
G = -218302.05 (J)  H = -188009.86 (J)  S = 27.46 (J/K)  V = 5.24 (cc)  Cp = 15.67 (J/K)

rhm-oxide  mass = 1.27 (gm)  density = 4.54 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.68Mg0.17Fe'"0.09Al0.15Ti0.88O3
G = -13088.33 (J)  H = -10477.69 (J)  S = 2.37 (J/K)  V = 0.28 (cc)  Cp = 1.20 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 16.75 | 4.63 | 68.08 | 3.14 | 7.40 |

Total solids  mass = 73.95 (gm)  density = 2.92 (gm/cc)
G = -1124657.29 (J)  H = -955874.34 (J)  S = 153.00 (J/K)  V = 25.36 (cc)  Cp = 85.56 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.76 (gm/cc)
G = -1545030.46 (J) H = -1304307.99 (J) S = 218.21 (J/K) V = 36.15 (cc) Cp = 120.49 (J/K)

Oxygen delta moles = -0.00283905 delta grams = -0.0908462
G = 698.88 (J) H = -74.71 (J) S = -0.70 (J/K) V = -260.40 (cc) Cp = -0.10 (J/K)

**********_____**********
Title: metapelite

T = 820.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.08 COH = 1.21 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 24.01 (gm) density = 2.40 (gm/cc) viscosity = 6.32 (log 10 poise) (analysis in wt %)
G = -388874.92 (J) H = -322687.90 (J) S = 60.55 (J/K) V = 10.01 (cc) Cp = 32.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.07 | 0.61 | 17.04 | 0.09 | 0.00 | 0.32 | 0.16 | 0.24 | 0.00 | 0.00 | 1.10 | 1.93 | 5.87 | 0.38 | 4.19 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.70 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.51Mg0.41)3Al2Si3O12
G = -342948.31 (J) H = -290177.56 (J) S = 48.27 (J/K) V = 6.35 (cc) Cp = 27.29 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.33 | 7.41 | 41.26 |

orthopyroxene mass = 0.44 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.67Mg1.24Fe'"0.01Ti0.00Al0.12Si1.93O6
G = -6217.22 (J) H = -5238.44 (J) S = 0.90 (J/K) V = 0.13 (cc) Cp = 0.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -71.95 | 98.00 | 66.83 | 5.90 | -5.37 | 6.20 | 0.39 |

feldspar mass = 14.76 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.71Ca0.16Al1.16Si2.84O8
G = -238248.70 (J) H = -203289.69 (J) S = 31.98 (J/K) V = 5.68 (cc) Cp = 17.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.10 | 15.86 | 13.04 |

feldspar mass = 20.57 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.61Na0.37Ca0.02Al1.02Si2.98O8
G = -323444.62 (J) H = -275497.07 (J) S = 43.86 (J/K) V = 8.09 (cc) Cp = 24.36 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.55 | 2.27 | 61.19 |

quartz mass = 14.11 (gm) density = 2.56 (gm/cc)
SiO2
G = -229562.23 (J) H = -198120.77 (J) S = 28.76 (J/K) V = 5.52 (cc) Cp = 16.48 (J/K)

rhm-oxide mass = 1.31 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.17Fe'"0.09Al0.15Ti0.88O3
G = -13548.36 (J) H = -10883.80 (J) S = 2.44 (J/K) V = 0.29 (cc) Cp = 1.24 (J/K)

geikielite hematite ilmenite pyrophanite corundum
17.27 4.40 67.83 3.24 7.26

Total solids mass = 75.89 (gm) density = 2.91 (gm/cc)
G = -1153969.44 (J) H = -983207.32 (J) S = 156.21 (J/K) V = 26.06 (cc) Cp = 87.74 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.77 (gm/cc)
G = -1542844.36 (J) H = -1305895.22 (J) S = 216.76 (J/K) V = 36.07 (cc) Cp = 120.11 (J/K)

Oxygen delta moles = -0.00286043 delta grams = -0.0915305
G = 697.08 (J) H = -74.27 (J) S = -0.71 (J/K) V = -259.98 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 810.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.09 COH = 1.18 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 22.28 (gm) density = 2.39 (gm/cc) viscosity = 6.20 (log 10 poise) (analysis in wt %)
G = -360796.78 (J) H = -299725.86 (J) S = 56.38 (J/K) V = 9.31 (cc) Cp = 30.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.83 | 0.56 | 17.04 | 0.08 | 0.00 | 0.29 | 0.17 | 0.24 | 0.00 | 0.00 | 1.12 | 1.99 | 5.77 | 0.41 | 4.52 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.33 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.51Mg0.42)3Al2Si3O12
G = -351701.44 (J) H = -298342.64 (J) S = 49.26 (J/K) V = 6.52 (cc) Cp = 27.97 (J/K)
almandine grossular pyrope
50.86 7.43 41.71

feldspar mass = 14.68 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.16Al1.16Si2.84O8
G = -236804.95 (J) H = -202514.69 (J) S = 31.66 (J/K) V = 5.65 (cc) Cp = 17.78 (J/K)
albite anorthite sanidine
71.59 15.95 12.45

feldspar mass = 21.54 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.62Na0.36Ca0.02Al1.02Si2.98O8
G = -338089.38 (J) H = -288620.51 (J) S = 45.67 (J/K) V = 8.47 (cc) Cp = 25.50 (J/K)
albite anorthite sanidine
35.62 2.09 62.29

quartz mass = 14.73 (gm) density = 2.56 (gm/cc)
SiO2
G = -239351.97 (J) H = -207000.06 (J) S = 29.87 (J/K) V = 5.76 (cc) Cp = 17.18 (J/K)

rhm-oxide mass = 1.35 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.18Fe'"0.08Al0.14Ti0.89O3
G = -13929.77 (J) H = -11228.53 (J) S = 2.49 (J/K) V = 0.30 (cc) Cp = 1.27 (J/K)

geikielite hematite ilmenite pyrophanite corundum
17.68 4.18 67.64 3.32 7.17

Total solids mass = 77.63 (gm) density = 2.91 (gm/cc)
G = -1179877.50 (J) H = -1007706.44 (J) S = 158.95 (J/K) V = 26.70 (cc) Cp = 89.70 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.77 (gm/cc)
G = -1540674.28 (J) H = -1307432.30 (J) S = 215.34 (J/K) V = 36.01 (cc) Cp = 119.79 (J/K)

Oxygen delta moles = -0.00287887 delta grams = -0.0921204
G = 694.48 (J) H = -73.73 (J) S = -0.71 (J/K) V = -259.26 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 800.00 (C) P = 7.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.10 COH = 1.14 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 20.81 (gm) density = 2.39 (gm/cc) viscosity = 6.15 (log 10 poise) (analysis in wt %)
G = -337066.40 (J) H = -280491.56 (J) S = 52.72 (J/K) V = 8.70 (cc) Cp = 28.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.34 | 0.53 | 17.46 | 0.07 | 0.00 | 0.26 | 0.18 | 0.21 | 0.00 | 0.00 | 1.11 | 1.92 | 5.70 | 0.44 | 4.77 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.00 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.52Mg0.41)3Al2Si3O12
G = -345819.96 (J) H = -293946.12 (J) S = 48.34 (J/K) V = 6.42 (cc) Cp = 27.54 (J/K)
almandine grossular pyrope
51.60 7.36 41.04

biotite mass = 0.33 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -5257.25 (J) H = -4481.74 (J) S = 0.72 (J/K) V = 0.12 (cc) Cp = 0.42 (J/K)
annite phlogopite
0.98 99.02

feldspar mass = 15.45 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.16Al1.16Si2.84O8
G = -248883.08 (J) H = -213332.10 (J) S = 33.13 (J/K) V = 5.94 (cc) Cp = 18.72 (J/K)
albite anorthite sanidine
71.89 16.38 11.73

feldspar mass = 21.67 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -339495.92 (J) H = -290476.65 (J) S = 45.68 (J/K) V = 8.52 (cc) Cp = 25.64 (J/K)
albite anorthite sanidine
34.40 1.94 63.67

quartz mass = 15.27 (gm) density = 2.56 (gm/cc)

SiO2
G = -247784.43 (J)  H = -214737.78 (J)  S = 30.79 (J/K)  V = 5.97 (cc)  Cp = 17.79 (J/K)

rhm-oxide  mass = 1.38 (gm)  density = 4.54 (gm/cc)  (analysis in mole %)
Mn0.03Fe"0.68Mg0.17Fe'"0.08Al0.15Ti0.89O3
G = -14212.95 (J)  H = -11491.39 (J)  S = 2.54 (J/K)  V = 0.30 (cc)  Cp = 1.30 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.21 | 3.96 | 68.05 | 3.38 | 7.41 |

Total solids  mass = 79.10 (gm)  density = 2.90 (gm/cc)
G = -1201453.60 (J)  H = -1028465.79 (J)  S = 161.20 (J/K)  V = 27.28 (cc)  Cp = 91.40 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.91 (gm)  density = 2.78 (gm/cc)
G = -1538520.00 (J)  H = -1308957.34 (J)  S = 213.91 (J/K)  V = 35.99 (cc)  Cp = 119.57 (J/K)

Oxygen  delta moles = -0.00289412  delta grams = -0.0926084
G = 691.03 (J)  H = -73.10 (J)  S = -0.71 (J/K)  V = -258.23 (cc)  Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 790.00 (C)  P = 7.000 (kbars)  log(10) f O2 = -14.09  delta HM = -5.14  NNO = 0.00  QFM = -0.11  COH = 1.11
IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid  mass = 19.46 (gm)  density = 2.39 (gm/cc)  viscosity = 6.09 (log 10 poise)  (analysis in wt %)
G = -315382.06 (J)  H = -262899.78 (J)  S = 49.36 (J/K)  V = 8.15 (cc)  Cp = 26.42 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.82 | 0.50 | 17.93 | 0.06 | 0.00 | 0.23 | 0.19 | 0.19 | 0.00 | 0.00 | 1.11 | 1.85 | 5.62 | 0.47 | 5.02 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 24.66 (gm)  density = 3.90 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.52Mg0.40)3Al2Si3O12
G = -339692.52 (J)  H = -289315.08 (J)  S = 47.39 (J/K)  V = 6.32 (cc)  Cp = 27.09 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.38 | 7.28 | 40.33 |

biotite  mass = 0.66 (gm)  density = 2.75 (gm/cc)  (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -10600.19 (J)  H = -9057.25 (J)  S = 1.45 (J/K)  V = 0.24 (cc)  Cp = 0.84 (J/K)

| annite | phlogopite |
|---|---|
| 1.00 | 99.00 |

feldspar  mass = 16.18 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.11Na0.72Ca0.17Al1.17Si2.83O8
G = -260453.99 (J)  H = -223760.00 (J)  S = 34.51 (J/K)  V = 6.22 (cc)  Cp = 19.63 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.15 | 16.78 | 11.07 |

feldspar  mass = 21.76 (gm)  density = 2.54 (gm/cc)  (analysis in mole %)

K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -340112.99 (J) H = -291661.46 (J) S = 45.57 (J/K) V = 8.56 (cc) Cp = 25.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 33.21 | 1.79 | 64.99 |

quartz mass = 15.78 (gm) density = 2.56 (gm/cc)
SiO2
G = -255673.81 (J) H = -222033.61 (J) S = 31.64 (J/K) V = 6.17 (cc) Cp = 18.36 (J/K)

rhm-oxide mass = 1.41 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.17Fe'"0.07Al0.15Ti0.89O3
G = -14464.78 (J) H = -11730.22 (J) S = 2.57 (J/K) V = 0.31 (cc) Cp = 1.32 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 16.71 | 3.74 | 68.45 | 3.42 | 7.68 |

Total solids mass = 80.44 (gm) density = 2.89 (gm/cc)
G = -1220998.27 (J) H = -1047557.61 (J) S = 163.14 (J/K) V = 27.82 (cc) Cp = 92.96 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1536380.33 (J) H = -1310457.39 (J) S = 212.50 (J/K) V = 35.97 (cc) Cp = 119.38 (J/K)

Oxygen delta moles = -0.0029086 delta grams = -0.0930718
G = 687.34 (J) H = -72.45 (J) S = -0.71 (J/K) V = -257.10 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 780.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.12 COH = 1.07 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 18.24 (gm) density = 2.39 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -295613.35 (J) H = -246838.40 (J) S = 46.31 (J/K) V = 7.64 (cc) Cp = 24.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.26 | 0.48 | 18.41 | 0.06 | 0.00 | 0.21 | 0.20 | 0.17 | 0.00 | 0.00 | 1.11 | 1.78 | 5.54 | 0.50 | 5.29 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.35 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.53Mg0.40)3Al2Si3O12
G = -334058.75 (J) H = -285091.64 (J) S = 46.50 (J/K) V = 6.23 (cc) Cp = 26.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.12 | 7.19 | 39.69 |

biotite mass = 0.96 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -15372.67 (J) H = -13165.13 (J) S = 2.10 (J/K) V = 0.35 (cc) Cp = 1.22 (J/K)

| annite | phlogopite |
|---|---|
| 1.01 | 98.99 |

feldspar mass = 16.84 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.10Na0.72Ca0.17Al1.17Si2.83O8
G = -270768.82 (J) H = -233150.21 (J) S = 35.72 (J/K) V = 6.47 (cc) Cp = 20.46 (J/K)
albite anorthite sanidine
72.39 17.16 10.45

feldspar mass = 21.85 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.66Na0.32Ca0.02Al1.02Si2.98O8
G = -340856.69 (J) H = -292957.50 (J) S = 45.48 (J/K) V = 8.59 (cc) Cp = 25.82 (J/K)
albite anorthite sanidine
32.08 1.66 66.25

quartz mass = 16.24 (gm) density = 2.56 (gm/cc)
SiO2
G = -262893.96 (J) H = -228774.78 (J) S = 32.40 (J/K) V = 6.35 (cc) Cp = 18.88 (J/K)

rhm-oxide mass = 1.43 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.16Fe'"0.07Al0.16Ti0.89O3
G = -14690.84 (J) H = -11949.78 (J) S = 2.60 (J/K) V = 0.32 (cc) Cp = 1.34 (J/K)
geikielite hematite ilmenite pyrophanite corundum
16.24 3.52 68.80 3.46 7.97

Total solids mass = 81.67 (gm) density = 2.89 (gm/cc)
G = -1238641.73 (J) H = -1065089.03 (J) S = 164.79 (J/K) V = 28.31 (cc) Cp = 94.40 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1534255.08 (J) H = -1311927.43 (J) S = 211.11 (J/K) V = 35.94 (cc) Cp = 119.22 (J/K)

Oxygen delta moles = -0.0029224 delta grams = -0.0935132
G = 683.42 (J) H = -71.77 (J) S = -0.72 (J/K) V = -255.89 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 770.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.14 COH = 1.04
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 17.11 (gm) density = 2.39 (gm/cc) viscosity = 5.97 (log 10 poise) (analysis in wt %)
G = -277462.21 (J) H = -232066.50 (J) S = 43.52 (J/K) V = 7.17 (cc) Cp = 23.35 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O
CO2 SO3 Cl2O-1 F2O-1
65.66 0.45 18.91 0.05 0.00 0.19 0.21 0.15 0.00 0.00 1.12 1.72 5.45 0.53 5.57 0.00 0.00 0.00
0.00

garnet mass = 24.06 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.54Mg0.39)3Al2Si3O12
G = -328867.08 (J) H = -281233.25 (J) S = 45.66 (J/K) V = 6.15 (cc) Cp = 26.30 (J/K)
almandine grossular pyrope
53.81 7.09 39.10

biotite mass = 1.23 (gm) density = 2.75 (gm/cc) (analysis in mole %)

K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -19645.93 (J) H = -16863.20 (J) S = 2.67 (J/K) V = 0.45 (cc) Cp = 1.55 (J/K)
annite phlogopite
1.00 99.00

feldspar mass = 17.43 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.18Al1.18Si2.82O8
G = -280044.45 (J) H = -241682.70 (J) S = 36.77 (J/K) V = 6.69 (cc) Cp = 21.24 (J/K)
albite anorthite sanidine
72.62 17.50 9.87

feldspar mass = 21.94 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.67Na0.31Ca0.02Al1.02Si2.98O8
G = -341680.36 (J) H = -294325.28 (J) S = 45.40 (J/K) V = 8.63 (cc) Cp = 25.93 (J/K)
albite anorthite sanidine
31.00 1.54 67.46

quartz mass = 16.67 (gm) density = 2.56 (gm/cc)
SiO2
G = -269547.89 (J) H = -235047.42 (J) S = 33.07 (J/K) V = 6.52 (cc) Cp = 19.35 (J/K)

rhm-oxide mass = 1.45 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.16Fe'"0.07Al0.17Ti0.88O3
G = -14896.15 (J) H = -12153.95 (J) S = 2.63 (J/K) V = 0.32 (cc) Cp = 1.36 (J/K)
geikielite hematite ilmenite pyrophanite corundum
15.82 3.31 69.10 3.50 8.27

Total solids mass = 82.79 (gm) density = 2.88 (gm/cc)
G = -1254681.86 (J) H = -1081305.80 (J) S = 166.20 (J/K) V = 28.75 (cc) Cp = 95.75 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1532144.07 (J) H = -1313372.30 (J) S = 209.72 (J/K) V = 35.93 (cc) Cp = 119.10 (J/K)

Oxygen delta moles = -0.00293553 delta grams = -0.0939333
G = 679.29 (J) H = -71.06 (J) S = -0.72 (J/K) V = -254.60 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 760.00 (C) P = 7.000 (kbars) log(10) f O2 = -14.77 delta HM = -5.17 NNO = 0.00 QFM = -0.15 COH = 1.00 IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid mass = 16.07 (gm) density = 2.38 (gm/cc) viscosity = 5.89 (log 10 poise) (analysis in wt %)
G = -260682.63 (J) H = -218384.87 (J) S = 40.94 (J/K) V = 6.74 (cc) Cp = 22.00 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
65.03 0.42 19.43 0.05 0.00 0.17 0.22 0.13 0.00 0.00 1.13 1.66 5.34 0.56 5.87 0.00 0.00 0.00 0.00

garnet mass = 23.80 (gm) density = 3.92 (gm/cc) (analysis in mole %)

(Ca0.07Fe"0.54Mg0.39)3Al2Si3O12
G = -324076.67 (J) H = -277706.49 (J) S = 44.88 (J/K) V = 6.07 (cc) Cp = 25.95 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.47 | 6.98 | 38.55 |

biotite mass = 1.47 (gm) density = 2.75 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -23475.73 (J) H = -20196.50 (J) S = 3.17 (J/K) V = 0.53 (cc) Cp = 1.86 (J/K)

| annite | phlogopite |
|---|---|
| 1.00 | 99.00 |

feldspar mass = 17.97 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.73Ca0.18Al1.18Si2.82O8
G = -288449.36 (J) H = -249497.30 (J) S = 37.70 (J/K) V = 6.89 (cc) Cp = 21.99 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.84 | 17.83 | 9.34 |

feldspar mass = 22.04 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -342557.53 (J) H = -295742.40 (J) S = 45.31 (J/K) V = 8.67 (cc) Cp = 26.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.96 | 1.43 | 68.61 |

quartz mass = 17.08 (gm) density = 2.56 (gm/cc)
SiO2
G = -275720.40 (J) H = -240922.53 (J) S = 33.68 (J/K) V = 6.68 (cc) Cp = 19.80 (J/K)

rhm-oxide mass = 1.47 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.69Mg0.15Fe'"0.06Al0.17Ti0.88O3
G = -15084.91 (J) H = -12345.98 (J) S = 2.65 (J/K) V = 0.32 (cc) Cp = 1.38 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.42 | 3.11 | 69.35 | 3.52 | 8.59 |

Total solids mass = 83.83 (gm) density = 2.87 (gm/cc)
G = -1269364.60 (J) H = -1096411.20 (J) S = 167.40 (J/K) V = 29.17 (cc) Cp = 97.03 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1530047.23 (J) H = -1314796.07 (J) S = 208.34 (J/K) V = 35.91 (cc) Cp = 119.03 (J/K)

Oxygen delta moles = -0.00294802 delta grams = -0.0943332
G = 674.97 (J) H = -70.33 (J) S = -0.72 (J/K) V = -253.23 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 750.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.16 COH = 0.97
IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 15.10 (gm) density = 2.38 (gm/cc) viscosity = 5.81 (log 10 poise) (analysis in wt %)
G = -245067.84 (J) H = -205625.72 (J) S = 38.55 (J/K) V = 6.34 (cc) Cp = 20.74 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.34 0.39 19.97 0.04 0.00 0.15 0.23 0.12 0.00 0.00 1.14 1.60 5.23 0.60 6.18 0.00 0.00 0.00 0.00

garnet mass = 23.56 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.55Mg0.38)3Al2Si3O12
G = -319655.67 (J) H = -274485.46 (J) S = 44.15 (J/K) V = 6.00 (cc) Cp = 25.62 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.08 | 6.86 | 38.06 |

biotite mass = 1.69 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -26905.20 (J) H = -23199.64 (J) S = 3.62 (J/K) V = 0.61 (cc) Cp = 2.13 (J/K)

| annite | phlogopite |
|---|---|
| 0.98 | 99.02 |

feldspar mass = 18.47 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.73Ca0.18Al1.18Si2.82O8
G = -296116.91 (J) H = -256704.87 (J) S = 38.52 (J/K) V = 7.08 (cc) Cp = 22.72 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.04 | 18.13 | 8.83 |

feldspar mass = 22.14 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -343475.67 (J) H = -297198.34 (J) S = 45.23 (J/K) V = 8.70 (cc) Cp = 26.20 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.95 | 1.33 | 69.73 |

quartz mass = 17.46 (gm) density = 2.56 (gm/cc)
SiO2
G = -281482.45 (J) H = -246459.56 (J) S = 34.23 (J/K) V = 6.83 (cc) Cp = 20.21 (J/K)

rhm-oxide mass = 1.49 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.70Mg0.15Fe'"0.06Al0.18Ti0.88O3
G = -15260.73 (J) H = -12528.72 (J) S = 2.67 (J/K) V = 0.33 (cc) Cp = 1.40 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.05 | 2.92 | 69.55 | 3.55 | 8.93 |

Total solids mass = 84.80 (gm) density = 2.87 (gm/cc)
G = -1282896.62 (J) H = -1110576.59 (J) S = 168.42 (J/K) V = 29.55 (cc) Cp = 98.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1527964.45 (J) H = -1316202.31 (J) S = 206.97 (J/K) V = 35.89 (cc) Cp = 119.01 (J/K)

Oxygen delta moles = -0.00295991 delta grams = -0.0947137
G = 670.45 (J) H = -69.58 (J) S = -0.72 (J/K) V = -251.79 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 740.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.17 COH = 0.93

IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 13.57 (gm) density = 2.38 (gm/cc) viscosity = 5.59 (log 10 poise) (analysis in wt %)
G = -220248.75 (J) H = -184906.33 (J) S = 34.88 (J/K) V = 5.71 (cc) Cp = 18.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.69 | 0.35 | 20.12 | 0.04 | 0.00 | 0.14 | 0.25 | 0.11 | 0.00 | 0.00 | 1.21 | 1.66 | 5.06 | 0.67 | 6.71 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.01 (gm) density = 3.94 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.56Mg0.37)3Al2Si3O12
G = -310324.30 (J) H = -266948.59 (J) S = 42.81 (J/K) V = 5.85 (cc) Cp = 24.93 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.41 | 7.05 | 36.54 |

biotite mass = 2.25 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -35752.71 (J) H = -30896.96 (J) S = 4.79 (J/K) V = 0.81 (cc) Cp = 2.83 (J/K)

| annite | phlogopite |
|---|---|
| 1.07 | 98.93 |

feldspar mass = 18.76 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.73Ca0.18Al1.18Si2.82O8
G = -300480.31 (J) H = -261064.90 (J) S = 38.90 (J/K) V = 7.19 (cc) Cp = 23.26 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.41 | 18.16 | 8.43 |

feldspar mass = 22.27 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -344903.31 (J) H = -299097.86 (J) S = 45.21 (J/K) V = 8.75 (cc) Cp = 26.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.13 | 1.22 | 70.65 |

quartz mass = 18.11 (gm) density = 2.59 (gm/cc)
SiO2
G = -291606.15 (J) H = -256264.33 (J) S = 34.88 (J/K) V = 6.98 (cc) Cp = 24.41 (J/K)

sillimanite mass = 0.42 (gm) density = 3.24 (gm/cc)
Al2SiO5
G = -7139.60 (J) H = -6351.88 (J) S = 0.78 (J/K) V = 0.13 (cc) Cp = 0.51 (J/K)

rhm-oxide mass = 1.52 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.70Mg0.14Fe'"0.06Al0.18Ti0.88O3
G = -15441.67 (J) H = -12707.12 (J) S = 2.70 (J/K) V = 0.33 (cc) Cp = 1.41 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.26 | 2.84 | 70.45 | 3.55 | 8.90 |

Total solids mass = 86.34 (gm) density = 2.87 (gm/cc)
G = -1305648.06 (J) H = -1133331.63 (J) S = 170.08 (J/K) V = 30.05 (cc) Cp = 103.75 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1525896.81 (J) H = -1318237.97 (J) S = 204.96 (J/K) V = 35.76 (cc) Cp = 122.46 (J/K)

Oxygen delta moles = -0.00296402 delta grams = -0.0948451
G = 664.14 (J) H = -68.64 (J) S = -0.72 (J/K) V = -249.68 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 730.00 (C) P = 7.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.18 COH = 0.89 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 9.15 (gm) density = 2.36 (gm/cc) viscosity = 5.08 (log 10 poise) (analysis in wt %)
G = -148599.37 (J) H = -124603.44 (J) S = 23.92 (J/K) V = 3.87 (cc) Cp = 12.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.36 | 0.28 | 19.86 | 0.05 | 0.00 | 0.15 | 0.34 | 0.10 | 0.00 | 0.00 | 1.58 | 1.90 | 4.75 | 0.99 | 7.64 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.20 (gm) density = 3.95 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.58Mg0.34)3Al2Si3O12
G = -296749.16 (J) H = -255655.77 (J) S = 40.96 (J/K) V = 5.62 (cc) Cp = 23.92 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 58.49 | 7.34 | 34.17 |

biotite mass = 3.07 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -48854.68 (J) H = -42309.90 (J) S = 6.52 (J/K) V = 1.11 (cc) Cp = 3.87 (J/K)

| annite | phlogopite |
|---|---|
| 1.31 | 98.69 |

muscovite mass = 3.88 (gm) density = 2.79 (gm/cc)
KAl2Si3AlO10(OH)2
G = -62217.52 (J) H = -54244.78 (J) S = 7.95 (J/K) V = 1.39 (cc) Cp = 5.01 (J/K)

feldspar mass = 20.24 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.08Na0.74Ca0.18Al1.18Si2.82O8
G = -323686.31 (J) H = -281831.17 (J) S = 41.72 (J/K) V = 7.75 (cc) Cp = 25.37 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.25 | 17.52 | 8.22 |

feldspar mass = 19.54 (gm) density = 2.54 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -302116.55 (J) H = -262571.15 (J) S = 39.42 (J/K) V = 7.68 (cc) Cp = 23.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 27.76 | 1.11 | 71.13 |

quartz mass = 20.26 (gm) density = 2.60 (gm/cc)
SiO2
G = -325880.18 (J) H = -286998.15 (J) S = 38.76 (J/K) V = 7.80 (cc) Cp = 27.07 (J/K)

rhm-oxide mass = 1.56 (gm) density = 4.57 (gm/cc) (analysis in mole %)

Mn0.04Fe"0.72Mg0.13Fe'"0.06Al0.17Ti0.89O3
G = -15754.41 (J) H = -12986.43 (J) S = 2.76 (J/K) V = 0.34 (cc) Cp = 1.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.13 | 2.89 | 71.58 | 3.86 | 8.54 |

Total solids mass = 90.76 (gm) density = 2.86 (gm/cc)
G = -1375258.81 (J) H = -1196597.35 (J) S = 178.10 (J/K) V = 31.70 (cc) Cp = 109.92 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.81 (gm/cc)
G = -1523858.19 (J) H = -1321200.79 (J) S = 202.02 (J/K) V = 35.57 (cc) Cp = 122.65 (J/K)

Oxygen delta moles = -0.002962 delta grams = -0.0947806
G = 656.47 (J) H = -67.56 (J) S = -0.72 (J/K) V = -247.05 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 1300.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.49  delta HM = -4.81  NNO = 0.00  QFM = 0.20  COH = 2.18  IW = 4.10

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.53 (gm/cc)  viscosity = 3.51 (log 10 poise)  (analysis in wt %)
G = -1661452.15 (J)  H = -1219701.49 (J)  S = 280.81 (J/K)  V = 39.45 (cc)  Cp = 143.63 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.80 | 16.91 | 0.97 | 0.00 | 5.83 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.51 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.53 (gm/cc)
G = -1661452.15 (J)  H = -1219701.49 (J)  S = 280.81 (J/K)  V = 39.45 (cc)  Cp = 143.63 (J/K)

Oxygen  delta moles = 1.73472e-16  delta grams = 5.55091e-15
G = -0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1290.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.59  delta HM = -4.81  NNO = 0.00  QFM = 0.19  COH = 2.16  IW = 4.11

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.54 (gm/cc)  viscosity = 3.56 (log 10 poise)  (analysis in wt %)
G = -1658650.21 (J)  H = -1221139.02 (J)  S = 279.89 (J/K)  V = 39.42 (cc)  Cp = 143.62 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.80 | 16.91 | 0.97 | 0.00 | 5.83 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.56 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.54 (gm/cc)
G = -1658650.21 (J)  H = -1221139.02 (J)  S = 279.89 (J/K)  V = 39.42 (cc)  Cp = 143.62 (J/K)

Oxygen  delta moles = 2.82956e-06  delta grams = 9.05424e-05
G = -1.03 (J)  H = 0.12 (J)  S = 0.00 (J/K)  V = 0.37 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1280.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.69  delta HM = -4.82  NNO = 0.00  QFM = 0.19  COH = 2.15  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 100.00 (gm)  density = 2.54 (gm/cc)  viscosity = 3.61 (log 10 poise)  (analysis in wt %)
G = -1655857.67 (J)  H = -1222576.65 (J)  S = 278.97 (J/K)  V = 39.39 (cc)  Cp = 143.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.42 | 0.80 | 16.91 | 0.97 | 0.00 | 5.83 | 0.06 | 2.93 | 0.00 | 0.00 | 1.53 | 2.54 | 3.93 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

Total solids  mass = 0.00 (gm)  density = 0.00 (gm/cc)
G = 0.00 (J)  H = 0.00 (J)  S = 0.00 (J/K)  V = 0.00 (cc)  Cp = 0.00 (J/K)

Viscosity of the System: 3.61 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.54 (gm/cc)
G = -1655857.67 (J)  H = -1222576.65 (J)  S = 278.97 (J/K)  V = 39.39 (cc)  Cp = 143.61 (J/K)

Oxygen  delta moles = 6.06329e-06  delta grams = 0.000194018
G = -2.18 (J)  H = 0.26 (J)  S = 0.00 (J/K)  V = 0.78 (cc)  Cp = 0.00 (J/K)

**********----------**********
Title: metapelite

T = 1270.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -6.80  delta HM = -4.82  NNO = 0.00  QFM = 0.18  COH = 2.13  IW = 4.12

Constraint Flags: fO2 path = NNO

Liquid  mass = 99.24 (gm)  density = 2.54 (gm/cc)  viscosity = 3.70 (log 10 poise)  (analysis in wt %)
G = -1641099.56 (J)  H = -1215262.14 (J)  S = 275.95 (J/K)  V = 39.09 (cc)  Cp = 142.38 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.49 | 0.80 | 17.02 | 0.96 | 0.00 | 5.77 | 0.06 | 2.74 | 0.00 | 0.00 | 1.54 | 2.56 | 3.96 | 0.09 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 0.76 (gm)  density = 3.29 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.44Mg1.47Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -11963.47 (J)  H = -9068.42 (J)  S = 1.88 (J/K)  V = 0.23 (cc)  Cp = 0.95 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -50.80 | 98.69 | 44.39 | 4.65 | -4.25 | 7.12 | 0.22 |

Total solids  mass = 0.76 (gm)  density = 3.29 (gm/cc)
G = -11963.47 (J)  H = -9068.42 (J)  S = 1.88 (J/K)  V = 0.23 (cc)  Cp = 0.95 (J/K)

Viscosity of the System: 3.71 (log 10 poise)

System  mass = 100.00 (gm)  density = 2.54 (gm/cc)
G = -1653063.03 (J)  H = -1224330.56 (J)  S = 277.83 (J/K)  V = 39.32 (cc)  Cp = 143.33 (J/K)

Oxygen delta moles = -1.29105e-05 delta grams = -0.000413122
G = 4.62 (J) H = -0.54 (J) S = -0.00 (J/K) V = -1.66 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1260.00 (C) P = 8.000 (kbars) log(10) f O2 = -6.90 delta HM = -4.83 NNO = 0.00 QFM = 0.18 COH = 2.11 IW = 4.13

Constraint Flags: fO2 path = NNO

Liquid mass = 98.50 (gm) density = 2.54 (gm/cc) viscosity = 3.78 (log 10 poise) (analysis in wt %)
G = -1626824.35 (J) H = -1208259.87 (J) S = 273.01 (J/K) V = 38.81 (cc) Cp = 141.19 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.57 | 0.81 | 17.12 | 0.95 | 0.00 | 5.70 | 0.06 | 2.56 | 0.00 | 0.00 | 1.55 | 2.57 | 3.99 | 0.09 | 1.02 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 1.50 (gm) density = 3.30 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.46Mg1.45Fe'"0.03Ti0.00Al0.12Si1.92O6
G = -23454.56 (J) H = -17809.09 (J) S = 3.68 (J/K) V = 0.45 (cc) Cp = 1.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -52.56 | 98.63 | 46.02 | 4.77 | -4.37 | 7.29 | 0.23 |

Total solids mass = 1.50 (gm) density = 3.30 (gm/cc)
G = -23454.56 (J) H = -17809.09 (J) S = 3.68 (J/K) V = 0.45 (cc) Cp = 1.87 (J/K)

Viscosity of the System: 3.80 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1650278.91 (J) H = -1226068.95 (J) S = 276.69 (J/K) V = 39.26 (cc) Cp = 143.06 (J/K)

Oxygen delta moles = -3.34429e-05 delta grams = -0.00107013
G = 11.87 (J) H = -1.40 (J) S = -0.01 (J/K) V = -4.26 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1250.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.01 delta HM = -4.83 NNO = 0.00 QFM = 0.17 COH = 2.10 IW = 4.14

Constraint Flags: fO2 path = NNO

Liquid mass = 97.78 (gm) density = 2.54 (gm/cc) viscosity = 3.87 (log 10 poise) (analysis in wt %)
G = -1613026.71 (J) H = -1201568.41 (J) S = 270.14 (J/K) V = 38.53 (cc) Cp = 140.05 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.65 | 0.81 | 17.23 | 0.95 | 0.00 | 5.62 | 0.06 | 2.39 | 0.00 | 0.00 | 1.56 | 2.59 | 4.01 | 0.09 | 1.03 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.21 (gm) density = 3.31 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.48Mg1.43Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -34478.55 (J) H = -26223.79 (J) S = 5.42 (J/K) V = 0.67 (cc) Cp = 2.76 (J/K)

diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-54.37 98.56 47.71 4.90 -4.49 7.46 0.24

Total solids mass = 2.21 (gm) density = 3.31 (gm/cc)
G = -34478.55 (J) H = -26223.79 (J) S = 5.42 (J/K) V = 0.67 (cc) Cp = 2.76 (J/K)

Viscosity of the System: 3.90 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1647505.26 (J) H = -1227792.20 (J) S = 275.56 (J/K) V = 39.20 (cc) Cp = 142.81 (J/K)

Oxygen delta moles = -5.56221e-05 delta grams = -0.00177984
G = 19.60 (J) H = -2.30 (J) S = -0.01 (J/K) V = -7.04 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1240.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.12 delta HM = -4.84 NNO = 0.00 QFM = 0.17 COH = 2.08 IW = 4.15

Constraint Flags: fO2 path = NNO

Liquid mass = 97.09 (gm) density = 2.54 (gm/cc) viscosity = 3.95 (log 10 poise) (analysis in wt %)
G = -1599666.36 (J) H = -1195160.59 (J) S = 267.33 (J/K) V = 38.26 (cc) Cp = 138.94 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.73 | 0.82 | 17.33 | 0.94 | 0.00 | 5.54 | 0.06 | 2.23 | 0.00 | 0.00 | 1.57 | 2.61 | 4.04 | 0.09 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 2.91 (gm) density = 3.32 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.49Mg1.41Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -45075.60 (J) H = -34341.02 (J) S = 7.09 (J/K) V = 0.88 (cc) Cp = 3.61 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-56.24 98.50 49.44 5.03 -4.62 7.64 0.25

Total solids mass = 2.91 (gm) density = 3.32 (gm/cc)
G = -45075.60 (J) H = -34341.02 (J) S = 7.09 (J/K) V = 0.88 (cc) Cp = 3.61 (J/K)

Viscosity of the System: 3.99 (log 10 poise)

System mass = 100.00 (gm) density = 2.55 (gm/cc)
G = -1644741.97 (J) H = -1229501.61 (J) S = 274.42 (J/K) V = 39.14 (cc) Cp = 142.56 (J/K)

Oxygen delta moles = -7.96066e-05 delta grams = -0.00254732
G = 27.85 (J) H = -3.27 (J) S = -0.02 (J/K) V = -10.02 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1230.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.23 delta HM = -4.84 NNO = 0.00 QFM = 0.16 COH = 2.06 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 96.41 (gm) density = 2.54 (gm/cc) viscosity = 4.04 (log 10 poise) (analysis in wt %)
G = -1586705.95 (J) H = -1189011.02 (J) S = 264.57 (J/K) V = 38.00 (cc) Cp = 137.87 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.82 | 0.82 | 17.42 | 0.93 | 0.00 | 5.45 | 0.06 | 2.08 | 0.00 | 0.00 | 1.57 | 2.63 | 4.07 | 0.09 | 1.04 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 3.59 (gm) density = 3.33 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.51Mg1.39Fe'"0.03Ti0.00Al0.13Si1.92O6
G = -55282.99 (J) H = -42187.31 (J) S = 8.71 (J/K) V = 1.08 (cc) Cp = 4.44 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -58.16 | 98.43 | 51.23 | 5.16 | -4.75 | 7.83 | 0.26 |

Total solids mass = 3.59 (gm) density = 3.33 (gm/cc)
G = -55282.99 (J) H = -42187.31 (J) S = 8.71 (J/K) V = 1.08 (cc) Cp = 4.44 (J/K)

Viscosity of the System: 4.09 (log 10 poise)

System mass = 100.00 (gm) density = 2.56 (gm/cc)
G = -1641988.94 (J) H = -1231198.34 (J) S = 273.29 (J/K) V = 39.08 (cc) Cp = 142.31 (J/K)

Oxygen delta moles = -0.000105555 delta grams = -0.00337764
G = 36.66 (J) H = -4.30 (J) S = -0.03 (J/K) V = -13.19 (cc) Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1220.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.34 delta HM = -4.84 NNO = 0.00 QFM = 0.15 COH = 2.04 IW = 4.16

Constraint Flags: fO2 path = NNO

Liquid mass = 95.74 (gm) density = 2.54 (gm/cc) viscosity = 4.13 (log 10 poise) (analysis in wt %)
G = -1574111.08 (J) H = -1183096.23 (J) S = 261.87 (J/K) V = 37.75 (cc) Cp = 136.83 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.90 | 0.83 | 17.52 | 0.91 | 0.00 | 5.36 | 0.06 | 1.94 | 0.00 | 0.00 | 1.58 | 2.65 | 4.10 | 0.09 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 4.25 (gm) density = 3.34 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.01Fe"0.53Mg1.37Fe'"0.03Ti0.00Al0.14Si1.92O6
G = -65135.03 (J) H = -49787.26 (J) S = 10.28 (J/K) V = 1.28 (cc) Cp = 5.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -60.13 | 98.36 | 53.06 | 5.31 | -4.89 | 8.02 | 0.27 |

Total solids mass = 4.25 (gm) density = 3.34 (gm/cc)
G = -65135.03 (J) H = -49787.26 (J) S = 10.28 (J/K) V = 1.28 (cc) Cp = 5.25 (J/K)

Viscosity of the System: 4.19 (log 10 poise)

System mass = 100.00 (gm) density = 2.56 (gm/cc)
G = -1639246.11 (J) H = -1232883.49 (J) S = 272.15 (J/K) V = 39.03 (cc) Cp = 142.08 (J/K)

Oxygen delta moles = -0.000133624 delta grams = -0.0042758

G = 46.06 (J)  H = -5.39 (J)  S = -0.03 (J/K)  V = -16.59 (cc)  Cp = -0.00 (J/K)

**********----------**********
Title: metapelite

T = 1210.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.45  delta HM = -4.85  NNO = 0.00  QFM = 0.15  COH = 2.02  IW = 4.17

Constraint Flags: fO2 path = NNO

Liquid  mass = 95.09 (gm)  density = 2.54 (gm/cc)  viscosity = 4.22 (log 10 poise)  (analysis in wt %)
G = -1561850.41 (J)  H = -1177394.66 (J)  S = 259.22 (J/K)  V = 37.50 (cc)  Cp = 135.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.99 | 0.83 | 17.62 | 0.90 | 0.00 | 5.25 | 0.06 | 1.80 | 0.00 | 0.00 | 1.59 | 2.67 | 4.13 | 0.10 | 1.06 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 4.91 (gm)  density = 3.34 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.55Mg1.35Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -74662.98 (J)  H = -57163.37 (J)  S = 11.80 (J/K)  V = 1.47 (cc)  Cp = 6.03 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -62.14 | 98.29 | 54.94 | 5.46 | -5.04 | 8.22 | 0.28 |

Total solids  mass = 4.91 (gm)  density = 3.34 (gm/cc)
G = -74662.98 (J)  H = -57163.37 (J)  S = 11.80 (J/K)  V = 1.47 (cc)  Cp = 6.03 (J/K)

Viscosity of the System: 4.28 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.57 (gm/cc)
G = -1636513.39 (J)  H = -1234558.03 (J)  S = 271.01 (J/K)  V = 38.97 (cc)  Cp = 141.85 (J/K)

Oxygen  delta moles = -0.000163962  delta grams = -0.00524658
G = 56.10 (J)  H = -6.55 (J)  S = -0.04 (J/K)  V = -20.22 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1200.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -7.56  delta HM = -4.85  NNO = 0.00  QFM = 0.14  COH = 2.01  IW = 4.18

Constraint Flags: fO2 path = NNO

Liquid  mass = 94.45 (gm)  density = 2.53 (gm/cc)  viscosity = 4.31 (log 10 poise)  (analysis in wt %)
G = -1549893.86 (J)  H = -1171841.50 (J)  S = 256.63 (J/K)  V = 37.26 (cc)  Cp = 128.40 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.08 | 0.84 | 17.71 | 0.89 | 0.00 | 5.14 | 0.06 | 1.68 | 0.00 | 0.00 | 1.60 | 2.68 | 4.16 | 0.10 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 5.55 (gm)  density = 3.35 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.01Fe"0.57Mg1.32Fe'"0.03Ti0.00Al0.14Si1.91O6
G = -83896.77 (J)  H = -64337.40 (J)  S = 13.28 (J/K)  V = 1.65 (cc)  Cp = 6.80 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -64.20 | 98.22 | 56.86 | 5.61 | -5.19 | 8.42 | 0.29 |

Total solids mass = 5.55 (gm) density = 3.35 (gm/cc)
G = -83896.77 (J) H = -64337.40 (J) S = 13.28 (J/K) V = 1.65 (cc) Cp = 6.80 (J/K)

Viscosity of the System: 4.38 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1633790.63 (J) H = -1236178.90 (J) S = 269.91 (J/K) V = 38.91 (cc) Cp = 135.20 (J/K)

Oxygen delta moles = -0.000196716 delta grams = -0.00629469
G = 66.80 (J) H = -7.79 (J) S = -0.05 (J/K) V = -24.09 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1190.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.68 delta HM = -4.86 NNO = 0.00 QFM = 0.14 COH = 1.99 IW = 4.19

Constraint Flags: fO2 path = NNO

Liquid mass = 93.81 (gm) density = 2.53 (gm/cc) viscosity = 4.40 (log 10 poise) (analysis in wt %)
G = -1538211.17 (J) H = -1166439.63 (J) S = 254.09 (J/K) V = 37.02 (cc) Cp = 127.44 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.18 | 0.84 | 17.80 | 0.87 | 0.00 | 5.03 | 0.06 | 1.56 | 0.00 | 0.00 | 1.60 | 2.70 | 4.18 | 0.10 | 1.07 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 6.18 (gm) density = 3.36 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.59Mg1.30Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -92866.28 (J) H = -71331.37 (J) S = 14.72 (J/K) V = 1.84 (cc) Cp = 7.55 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -66.30 | 98.14 | 58.81 | 5.78 | -5.36 | 8.64 | 0.30 |

Total solids mass = 6.18 (gm) density = 3.36 (gm/cc)
G = -92866.28 (J) H = -71331.37 (J) S = 14.72 (J/K) V = 1.84 (cc) Cp = 7.55 (J/K)

Viscosity of the System: 4.48 (log 10 poise)

System mass = 99.99 (gm) density = 2.57 (gm/cc)
G = -1631077.45 (J) H = -1237770.99 (J) S = 268.81 (J/K) V = 38.86 (cc) Cp = 134.99 (J/K)

Oxygen delta moles = -0.000232042 delta grams = -0.00742506
G = 78.19 (J) H = -9.11 (J) S = -0.06 (J/K) V = -28.23 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1180.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.80 delta HM = -4.86 NNO = 0.00 QFM = 0.13 COH = 1.97 IW = 4.20

Constraint Flags: fO2 path = NNO

Liquid mass = 93.19 (gm) density = 2.53 (gm/cc) viscosity = 4.49 (log 10 poise) (analysis in wt %)
G = -1526781.38 (J) H = -1161194.52 (J) S = 251.58 (J/K) V = 36.79 (cc) Cp = 126.50 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.28 0.85 17.89 0.86 0.00 4.90 0.06 1.44 0.00 0.00 1.61 2.72 4.21 0.10 1.08 0.00 0.00 0.00 0.00

orthopyroxene mass = 6.80 (gm) density = 3.37 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.61Mg1.28Fe'"0.03Ti0.00Al0.15Si1.91O6
G = -101592.44 (J) H = -78160.64 (J) S = 16.12 (J/K) V = 2.02 (cc) Cp = 8.28 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-68.43 98.07 60.78 5.95 -5.53 8.86 0.31

Total solids mass = 6.80 (gm) density = 3.37 (gm/cc)
G = -101592.44 (J) H = -78160.64 (J) S = 16.12 (J/K) V = 2.02 (cc) Cp = 8.28 (J/K)

Viscosity of the System: 4.59 (log 10 poise)

System mass = 99.99 (gm) density = 2.58 (gm/cc)
G = -1628373.81 (J) H = -1239355.16 (J) S = 267.71 (J/K) V = 38.80 (cc) Cp = 134.79 (J/K)

Oxygen delta moles = -0.000270051 delta grams = -0.00864129
G = 90.31 (J) H = -10.50 (J) S = -0.07 (J/K) V = -32.63 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1170.00 (C) P = 8.000 (kbars) log(10) f O2 = -7.91 delta HM = -4.87 NNO = 0.00 QFM = 0.12 COH = 1.95 IW = 4.21

Constraint Flags: fO2 path = NNO

Liquid mass = 92.57 (gm) density = 2.53 (gm/cc) viscosity = 4.59 (log 10 poise) (analysis in wt %)
G = -1515587.66 (J) H = -1156094.13 (J) S = 249.10 (J/K) V = 36.56 (cc) Cp = 125.58 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
64.38 0.85 17.98 0.84 0.00 4.77 0.07 1.34 0.00 0.00 1.62 2.74 4.24 0.10 1.09 0.00 0.00 0.00 0.00

orthopyroxene mass = 7.42 (gm) density = 3.38 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.63Mg1.26Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -110092.04 (J) H = -84837.74 (J) S = 17.50 (J/K) V = 2.19 (cc) Cp = 9.00 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-70.59 97.99 62.77 6.13 -5.71 9.08 0.32

Total solids mass = 7.42 (gm) density = 3.38 (gm/cc)
G = -110092.04 (J) H = -84837.74 (J) S = 17.50 (J/K) V = 2.19 (cc) Cp = 9.00 (J/K)

Viscosity of the System: 4.69 (log 10 poise)

System mass = 99.99 (gm) density = 2.58 (gm/cc)
G = -1625679.70 (J) H = -1240931.87 (J) S = 266.60 (J/K) V = 38.75 (cc) Cp = 134.58 (J/K)

Oxygen delta moles = -0.000310826 delta grams = -0.00994607
G = 103.15 (J) H = -11.97 (J) S = -0.08 (J/K) V = -37.30 (cc) Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1160.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.04  delta HM = -4.88  NNO = 0.00  QFM = 0.12  COH = 1.93  IW = 4.22

Constraint Flags: fO2 path = NNO

Liquid  mass = 91.96 (gm)  density = 2.53 (gm/cc)  viscosity = 4.68 (log 10 poise)  (analysis in wt %)
G = -1504617.05 (J)  H = -1151129.02 (J)  S = 246.65 (J/K)  V = 36.33 (cc)  Cp = 124.67 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.48 | 0.86 | 18.07 | 0.82 | 0.00 | 4.63 | 0.07 | 1.24 | 0.00 | 0.00 | 1.63 | 2.75 | 4.27 | 0.10 | 1.09 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.03 (gm)  density = 3.39 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.65Mg1.23Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -118378.07 (J)  H = -91372.45 (J)  S = 18.84 (J/K)  V = 2.36 (cc)  Cp = 9.71 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -72.76 | 97.92 | 64.77 | 6.32 | -5.89 | 9.32 | 0.33 |

Total solids  mass = 8.03 (gm)  density = 3.39 (gm/cc)
G = -118378.07 (J)  H = -91372.45 (J)  S = 18.84 (J/K)  V = 2.36 (cc)  Cp = 9.71 (J/K)

Viscosity of the System: 4.79 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.58 (gm/cc)
G = -1622995.12 (J)  H = -1242501.48 (J)  S = 265.49 (J/K)  V = 38.69 (cc)  Cp = 134.38 (J/K)

Oxygen  delta moles = -0.000354422  delta grams = -0.0113411
G = 116.71 (J)  H = -13.52 (J)  S = -0.09 (J/K)  V = -42.23 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1150.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.16  delta HM = -4.88  NNO = 0.00  QFM = 0.11  COH = 1.91  IW = 4.23

Constraint Flags: fO2 path = NNO

Liquid  mass = 91.36 (gm)  density = 2.53 (gm/cc)  viscosity = 4.78 (log 10 poise)  (analysis in wt %)
G = -1493860.54 (J)  H = -1146292.43 (J)  S = 244.22 (J/K)  V = 36.10 (cc)  Cp = 123.78 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.59 | 0.86 | 18.15 | 0.80 | 0.00 | 4.48 | 0.07 | 1.14 | 0.00 | 0.00 | 1.63 | 2.77 | 4.30 | 0.10 | 1.10 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 8.63 (gm)  density = 3.40 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.67Mg1.21Fe'"0.03Ti0.00Al0.16Si1.90O6
G = -126459.57 (J)  H = -97771.75 (J)  S = 20.16 (J/K)  V = 2.53 (cc)  Cp = 10.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -74.94 | 97.84 | 66.77 | 6.52 | -6.09 | 9.56 | 0.34 |

Total solids  mass = 8.63 (gm)  density = 3.40 (gm/cc)

G = -126459.57 (J)  H = -97771.75 (J)  S = 20.16 (J/K)  V = 2.53 (cc)  Cp = 10.40 (J/K)

Viscosity of the System: 4.90 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.59 (gm/cc)
G = -1620320.12 (J)  H = -1244064.18 (J)  S = 264.38 (J/K)  V = 38.64 (cc)  Cp = 134.18 (J/K)

Oxygen  delta moles = -0.000400853  delta grams = -0.0128268
G = 130.97 (J)  H = -15.15 (J)  S = -0.10 (J/K)  V = -47.43 (cc)  Cp = -0.01 (J/K)

**********----------**********
Title: metapelite

T = 1140.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.28  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.89  IW = 4.24

Constraint Flags: fO2 path = NNO

Liquid  mass = 90.76 (gm)  density = 2.53 (gm/cc)  viscosity = 4.88 (log 10 poise)  (analysis in wt %)
G = -1483313.05 (J)  H = -1141580.28 (J)  S = 241.82 (J/K)  V = 35.88 (cc)  Cp = 122.91 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.70 | 0.87 | 18.24 | 0.78 | 0.00 | 4.33 | 0.07 | 1.06 | 0.00 | 0.00 | 1.64 | 2.79 | 4.32 | 0.10 | 1.11 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 9.22 (gm)  density = 3.41 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.69Mg1.19Fe'"0.04Ti0.00Al0.17Si1.90O6
G = -134341.70 (J)  H = -104039.77 (J)  S = 21.44 (J/K)  V = 2.70 (cc)  Cp = 11.08 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -77.11 | 97.77 | 68.76 | 6.72 | -6.30 | 9.80 | 0.35 |

Total solids  mass = 9.22 (gm)  density = 3.41 (gm/cc)
G = -134341.70 (J)  H = -104039.77 (J)  S = 21.44 (J/K)  V = 2.70 (cc)  Cp = 11.08 (J/K)

Viscosity of the System: 5.01 (log 10 poise)

System  mass = 99.99 (gm)  density = 2.59 (gm/cc)
G = -1617654.75 (J)  H = -1245620.05 (J)  S = 263.27 (J/K)  V = 38.59 (cc)  Cp = 133.99 (J/K)

Oxygen  delta moles = -0.000450098  delta grams = -0.0144026
G = 145.90 (J)  H = -16.84 (J)  S = -0.12 (J/K)  V = -52.88 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1130.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.41  delta HM = -4.89  NNO = 0.00  QFM = 0.10  COH = 1.87  IW = 4.25

Constraint Flags: fO2 path = NNO

Liquid  mass = 90.17 (gm)  density = 2.53 (gm/cc)  viscosity = 4.98 (log 10 poise)  (analysis in wt %)
G = -1472973.24 (J)  H = -1136991.15 (J)  S = 239.45 (J/K)  V = 35.67 (cc)  Cp = 122.04 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

64.82 0.87 18.32 0.76 0.00 4.17 0.07 0.98 0.00 0.00 1.64 2.81 4.35 0.10 1.12 0.00 0.00 0.00 0.00

orthopyroxene mass = 9.81 (gm) density = 3.42 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.71Mg1.16Fe'''0.04Ti0.00Al0.17Si1.90O6
G = -142025.85 (J) H = -110177.90 (J) S = 22.70 (J/K) V = 2.86 (cc) Cp = 11.75 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.27 | 97.70 | 70.72 | 6.94 | -6.51 | 10.06 | 0.37 |

Total solids mass = 9.81 (gm) density = 3.42 (gm/cc)
G = -142025.85 (J) H = -110177.90 (J) S = 22.70 (J/K) V = 2.86 (cc) Cp = 11.75 (J/K)

Viscosity of the System: 5.12 (log 10 poise)

System mass = 99.98 (gm) density = 2.59 (gm/cc)
G = -1614999.09 (J) H = -1247169.05 (J) S = 262.15 (J/K) V = 38.53 (cc) Cp = 133.79 (J/K)

Oxygen delta moles = -0.00050209 delta grams = -0.0160663
G = 161.47 (J) H = -18.61 (J) S = -0.13 (J/K) V = -58.57 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1120.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.53 delta HM = -4.90 NNO = 0.00 QFM = 0.09 COH = 1.85 IW = 4.26

Constraint Flags: fO2 path = NNO

Liquid mass = 89.59 (gm) density = 2.53 (gm/cc) viscosity = 5.08 (log 10 poise) (analysis in wt %)
G = -1462843.20 (J) H = -1132526.03 (J) S = 237.10 (J/K) V = 35.45 (cc) Cp = 121.20 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.93 | 0.88 | 18.40 | 0.73 | 0.00 | 4.00 | 0.07 | 0.90 | 0.00 | 0.00 | 1.65 | 2.83 | 4.38 | 0.10 | 1.12 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 10.39 (gm) density = 3.43 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.73Mg1.14Fe'''0.04Ti0.00Al0.18Si1.89O6
G = -149510.04 (J) H = -116184.99 (J) S = 23.92 (J/K) V = 3.03 (cc) Cp = 12.40 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -81.39 | 97.62 | 72.64 | 7.17 | -6.74 | 10.32 | 0.38 |

Total solids mass = 10.39 (gm) density = 3.43 (gm/cc)
G = -149510.04 (J) H = -116184.99 (J) S = 23.92 (J/K) V = 3.03 (cc) Cp = 12.40 (J/K)

Viscosity of the System: 5.23 (log 10 poise)

System mass = 99.98 (gm) density = 2.60 (gm/cc)
G = -1612353.24 (J) H = -1248711.01 (J) S = 261.02 (J/K) V = 38.48 (cc) Cp = 133.60 (J/K)

Oxygen delta moles = -0.000556722 delta grams = -0.0178144
G = 177.62 (J) H = -20.43 (J) S = -0.14 (J/K) V = -64.49 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1110.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.66  delta HM = -4.90  NNO = 0.00  QFM = 0.08  COH = 1.83  IW = 4.27

Constraint Flags: fO2 path = NNO

Liquid  mass = 89.02 (gm)  density = 2.53 (gm/cc)  viscosity = 5.18 (log 10 poise)  (analysis in wt %)
G = -1452927.96 (J)  H = -1128188.02 (J)  S = 234.78 (J/K)  V = 35.25 (cc)  Cp = 120.37 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.05 | 0.88 | 18.48 | 0.71 | 0.00 | 3.83 | 0.07 | 0.83 | 0.00 | 0.00 | 1.66 | 2.84 | 4.41 | 0.10 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 10.96 (gm)  density = 3.44 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.75Mg1.12Fe"'0.04Ti0.00Al0.18Si1.89O6
G = -156789.38 (J)  H = -122057.66 (J)  S = 25.11 (J/K)  V = 3.18 (cc)  Cp = 13.04 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -83.47 | 97.55 | 74.52 | 7.41 | -6.97 | 10.58 | 0.39 |

Total solids  mass = 10.96 (gm)  density = 3.44 (gm/cc)
G = -156789.38 (J)  H = -122057.66 (J)  S = 25.11 (J/K)  V = 3.18 (cc)  Cp = 13.04 (J/K)

Viscosity of the System: 5.34 (log 10 poise)

System  mass = 99.98 (gm)  density = 2.60 (gm/cc)
G = -1609717.34 (J)  H = -1250245.68 (J)  S = 259.89 (J/K)  V = 38.43 (cc)  Cp = 133.41 (J/K)

Oxygen  delta moles = -0.000613844  delta grams = -0.0196423
G = 194.28 (J)  H = -22.30 (J)  S = -0.16 (J/K)  V = -70.59 (cc)  Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1100.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -8.80  delta HM = -4.91  NNO = 0.00  QFM = 0.07  COH = 1.81  IW = 4.28

Constraint Flags: fO2 path = NNO

Liquid  mass = 88.45 (gm)  density = 2.52 (gm/cc)  viscosity = 5.28 (log 10 poise)  (analysis in wt %)
G = -1443234.82 (J)  H = -1123981.96 (J)  S = 232.50 (J/K)  V = 35.04 (cc)  Cp = 119.56 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.17 | 0.89 | 18.56 | 0.68 | 0.00 | 3.66 | 0.07 | 0.77 | 0.00 | 0.00 | 1.66 | 2.86 | 4.44 | 0.10 | 1.14 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene  mass = 11.52 (gm)  density = 3.45 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.76Mg1.10Fe"'0.04Ti0.00Al0.19Si1.89O6
G = -163856.70 (J)  H = -127790.78 (J)  S = 26.27 (J/K)  V = 3.34 (cc)  Cp = 13.67 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.51 | 97.49 | 76.33 | 7.65 | -7.21 | 10.85 | 0.40 |

Total solids  mass = 11.52 (gm)  density = 3.45 (gm/cc)
G = -163856.70 (J)  H = -127790.78 (J)  S = 26.27 (J/K)  V = 3.34 (cc)  Cp = 13.67 (J/K)

Viscosity of the System: 5.45 (log 10 poise)

System mass = 99.98 (gm) density = 2.61 (gm/cc)
G = -1607091.52 (J) H = -1251772.73 (J) S = 258.76 (J/K) V = 38.38 (cc) Cp = 133.23 (J/K)

Oxygen delta moles = -0.000673266 delta grams = -0.0215437
G = 211.37 (J) H = -24.22 (J) S = -0.17 (J/K) V = -76.87 (cc) Cp = -0.02 (J/K)

**********----------**********
Title: metapelite

T = 1090.00 (C) P = 8.000 (kbars) log(10) f O2 = -8.93 delta HM = -4.91 NNO = 0.00 QFM = 0.07 COH = 1.79 IW = 4.29

Constraint Flags: fO2 path = NNO

Liquid mass = 87.90 (gm) density = 2.52 (gm/cc) viscosity = 5.39 (log 10 poise) (analysis in wt %)
G = -1433772.63 (J) H = -1119913.88 (J) S = 230.25 (J/K) V = 34.84 (cc) Cp = 118.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.30 | 0.89 | 18.64 | 0.66 | 0.00 | 3.48 | 0.07 | 0.71 | 0.00 | 0.00 | 1.67 | 2.88 | 4.47 | 0.10 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.07 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.78Mg1.08Fe'"0.04Ti0.00Al0.19Si1.88O6
G = -170703.31 (J) H = -133377.91 (J) S = 27.38 (J/K) V = 3.49 (cc) Cp = 14.28 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -87.47 | 97.42 | 78.09 | 7.90 | -7.46 | 11.12 | 0.41 |

Total solids mass = 12.07 (gm) density = 3.46 (gm/cc)
G = -170703.31 (J) H = -133377.91 (J) S = 27.38 (J/K) V = 3.49 (cc) Cp = 14.28 (J/K)

Viscosity of the System: 5.56 (log 10 poise)

System mass = 99.98 (gm) density = 2.61 (gm/cc)
G = -1604475.95 (J) H = -1253291.80 (J) S = 257.63 (J/K) V = 38.33 (cc) Cp = 133.04 (J/K)

Oxygen delta moles = -0.000734765 delta grams = -0.0235116
G = 228.81 (J) H = -26.16 (J) S = -0.19 (J/K) V = -83.28 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1080.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.06 delta HM = -4.92 NNO = 0.00 QFM = 0.06 COH = 1.76 IW = 4.30

Constraint Flags: fO2 path = NNO

Liquid mass = 87.36 (gm) density = 2.52 (gm/cc) viscosity = 5.49 (log 10 poise) (analysis in wt %)
G = -1424551.01 (J) H = -1115990.53 (J) S = 228.03 (J/K) V = 34.64 (cc) Cp = 117.99 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.42 | 0.90 | 18.71 | 0.63 | 0.00 | 3.30 | 0.07 | 0.65 | 0.00 | 0.00 | 1.67 | 2.89 | 4.49 | 0.10 | 1.15 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 12.61 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.80Mg1.06Fe'"0.04Ti0.00Al0.20Si1.88O6
G = -177319.78 (J) H = -138811.94 (J) S = 28.46 (J/K) V = 3.63 (cc) Cp = 14.87 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -89.37 | 97.35 | 79.76 | 8.16 | -7.72 | 11.38 | 0.43 |

Total solids mass = 12.61 (gm) density = 3.47 (gm/cc)
G = -177319.78 (J) H = -138811.94 (J) S = 28.46 (J/K) V = 3.63 (cc) Cp = 14.87 (J/K)

Viscosity of the System: 5.68 (log 10 poise)

System mass = 99.97 (gm) density = 2.61 (gm/cc)
G = -1601870.79 (J) H = -1254802.48 (J) S = 256.49 (J/K) V = 38.28 (cc) Cp = 132.86 (J/K)

Oxygen delta moles = -0.000798089 delta grams = -0.0255379
G = 246.49 (J) H = -28.13 (J) S = -0.20 (J/K) V = -89.79 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1070.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.20 delta HM = -4.93 NNO = 0.00 QFM = 0.05 COH = 1.74 IW = 4.31

Constraint Flags: fO2 path = NNO

Liquid mass = 86.84 (gm) density = 2.52 (gm/cc) viscosity = 5.60 (log 10 poise) (analysis in wt %)
G = -1415579.51 (J) H = -1112218.79 (J) S = 225.86 (J/K) V = 34.45 (cc) Cp = 117.24 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.54 | 0.90 | 18.78 | 0.60 | 0.00 | 3.13 | 0.07 | 0.60 | 0.00 | 0.00 | 1.68 | 2.91 | 4.52 | 0.10 | 1.16 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.13 (gm) density = 3.48 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.81Mg1.04Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -183696.72 (J) H = -144085.61 (J) S = 29.49 (J/K) V = 3.77 (cc) Cp = 15.45 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.18 | 97.29 | 81.36 | 8.43 | -7.98 | 11.65 | 0.44 |

Total solids mass = 13.13 (gm) density = 3.48 (gm/cc)
G = -183696.72 (J) H = -144085.61 (J) S = 29.49 (J/K) V = 3.77 (cc) Cp = 15.45 (J/K)

Viscosity of the System: 5.79 (log 10 poise)

System mass = 99.97 (gm) density = 2.62 (gm/cc)
G = -1599276.23 (J) H = -1256304.40 (J) S = 255.35 (J/K) V = 38.23 (cc) Cp = 132.69 (J/K)

Oxygen delta moles = -0.000862963 delta grams = -0.0276138
G = 264.34 (J) H = -30.10 (J) S = -0.22 (J/K) V = -96.37 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1060.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.34 delta HM = -4.93 NNO = 0.00 QFM = 0.04 COH = 1.72 IW

= 4.32

Constraint Flags: fO2 path = NNO

Liquid mass = 86.33 (gm) density = 2.52 (gm/cc) viscosity = 5.71 (log 10 poise) (analysis in wt %)
G = -1406866.96 (J) H = -1108605.19 (J) S = 223.73 (J/K) V = 34.27 (cc) Cp = 116.51 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.67 | 0.91 | 18.84 | 0.57 | 0.00 | 2.95 | 0.07 | 0.56 | 0.00 | 0.00 | 1.68 | 2.93 | 4.55 | 0.10 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 13.64 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.83Mg1.02Fe'"0.04Ti0.00Al0.21Si1.88O6
G = -189825.48 (J) H = -149192.03 (J) S = 30.48 (J/K) V = 3.91 (cc) Cp = 16.00 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -92.92 | 97.23 | 82.87 | 8.70 | -8.25 | 11.92 | 0.45 |

Total solids mass = 13.64 (gm) density = 3.49 (gm/cc)
G = -189825.48 (J) H = -149192.03 (J) S = 30.48 (J/K) V = 3.91 (cc) Cp = 16.00 (J/K)

Viscosity of the System: 5.91 (log 10 poise)

System mass = 99.97 (gm) density = 2.62 (gm/cc)
G = -1596692.45 (J) H = -1257797.22 (J) S = 254.21 (J/K) V = 38.18 (cc) Cp = 132.51 (J/K)

Oxygen delta moles = -0.000929099 delta grams = -0.0297301
G = 282.24 (J) H = -32.08 (J) S = -0.24 (J/K) V = -102.98 (cc) Cp = -0.03 (J/K)

**********----------**********
Title: metapelite

T = 1050.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.48 delta HM = -4.94 NNO = 0.00 QFM = 0.04 COH = 1.70 IW = 4.33

Constraint Flags: fO2 path = NNO

Liquid mass = 85.84 (gm) density = 2.52 (gm/cc) viscosity = 5.82 (log 10 poise) (analysis in wt %)
G = -1398420.84 (J) H = -1105155.48 (J) S = 221.64 (J/K) V = 34.09 (cc) Cp = 115.81 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.79 | 0.91 | 18.91 | 0.55 | 0.00 | 2.78 | 0.07 | 0.52 | 0.00 | 0.00 | 1.69 | 2.94 | 4.57 | 0.11 | 1.17 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.13 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.84Mg1.00Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -195698.78 (J) H = -154125.18 (J) S = 31.42 (J/K) V = 4.04 (cc) Cp = 16.53 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.56 | 97.16 | 84.29 | 8.98 | -8.52 | 12.18 | 0.46 |

Total solids mass = 14.13 (gm) density = 3.50 (gm/cc)
G = -195698.78 (J) H = -154125.18 (J) S = 31.42 (J/K) V = 4.04 (cc) Cp = 16.53 (J/K)

Viscosity of the System: 6.03 (log 10 poise)

System mass = 99.97 (gm) density = 2.62 (gm/cc)
G = -1594119.62 (J) H = -1259280.66 (J) S = 253.06 (J/K) V = 38.13 (cc) Cp = 132.34 (J/K)

Oxygen delta moles = -0.000996202 delta grams = -0.0318773
G = 300.09 (J) H = -34.03 (J) S = -0.25 (J/K) V = -109.59 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1040.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.62 delta HM = -4.94 NNO = 0.00 QFM = 0.03 COH = 1.67 IW = 4.34

Constraint Flags: fO2 path = NNO

Liquid mass = 82.60 (gm) density = 2.51 (gm/cc) viscosity = 5.93 (log 10 poise) (analysis in wt %)
G = -1345175.17 (J) H = -1066072.73 (J) S = 212.54 (J/K) V = 32.85 (cc) Cp = 111.29 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.08 | 0.95 | 18.86 | 0.51 | 0.00 | 2.61 | 0.07 | 0.47 | 0.00 | 0.00 | 1.59 | 2.81 | 4.71 | 0.11 | 1.22 | 0.00 | 0.00 | 0.00 | 0.00 |

orthopyroxene mass = 14.79 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.86Mg0.98Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -203484.63 (J) H = -160538.43 (J) S = 32.70 (J/K) V = 4.22 (cc) Cp = 17.25 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -97.00 | 97.33 | 86.43 | 9.13 | -8.66 | 12.32 | 0.45 |

feldspar mass = 2.57 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.25Al1.25Si2.75O8
G = -42877.42 (J) H = -34833.57 (J) S = 6.13 (J/K) V = 0.99 (cc) Cp = 3.16 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.90 | 25.05 | 7.05 |

Total solids mass = 17.36 (gm) density = 3.34 (gm/cc)
G = -246362.05 (J) H = -195372.00 (J) S = 38.83 (J/K) V = 5.20 (cc) Cp = 20.41 (J/K)

Viscosity of the System: 6.21 (log 10 poise)

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1591537.22 (J) H = -1261444.73 (J) S = 251.37 (J/K) V = 38.05 (cc) Cp = 131.71 (J/K)

Oxygen delta moles = -0.00110724 delta grams = -0.0354303
G = 330.74 (J) H = -37.43 (J) S = -0.28 (J/K) V = -120.89 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1030.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.77 delta HM = -4.95 NNO = 0.00 QFM = 0.02 COH = 1.65 IW = 4.35

Constraint Flags: fO2 path = NNO

Liquid mass = 79.54 (gm) density = 2.51 (gm/cc) viscosity = 6.05 (log 10 poise) (analysis in wt %)
G = -1294801.68 (J) H = -1029039.75 (J) S = 203.94 (J/K) V = 31.68 (cc) Cp = 107.03 (J/K)

SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.37 0.98 18.81 0.48 0.00 2.44 0.08 0.43 0.00 0.00 1.51 2.68 4.85 0.11 1.27 0.00 0.00 0.00 0.00

orthopyroxene mass = 15.39 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.88Mg0.96Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -210545.45 (J) H = -166418.42 (J) S = 33.86 (J/K) V = 4.38 (cc) Cp = 17.91 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-99.21 97.48 88.37 9.28 -8.81 12.45 0.44

feldspar mass = 5.03 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.07Na0.68Ca0.24Al1.24Si2.76O8
G = -83626.24 (J) H = -68086.44 (J) S = 11.92 (J/K) V = 1.93 (cc) Cp = 6.17 (J/K)
albite anorthite sanidine
68.38 24.16 7.47

Total solids mass = 20.42 (gm) density = 3.24 (gm/cc)
G = -294171.69 (J) H = -234504.86 (J) S = 45.79 (J/K) V = 6.31 (cc) Cp = 24.08 (J/K)

Viscosity of the System: 6.40 (log 10 poise)

System mass = 99.96 (gm) density = 2.63 (gm/cc)
G = -1588973.37 (J) H = -1263544.61 (J) S = 249.72 (J/K) V = 37.98 (cc) Cp = 131.11 (J/K)

Oxygen delta moles = -0.00121511 delta grams = -0.038882
G = 359.88 (J) H = -40.64 (J) S = -0.31 (J/K) V = -131.65 (cc) Cp = -0.04 (J/K)

**********----------**********
Title: metapelite

T = 1020.00 (C) P = 8.000 (kbars) log(10) f O2 = -9.92 delta HM = -4.96 NNO = 0.00 QFM = 0.01 COH = 1.63 IW = 4.36

Constraint Flags: fO2 path = NNO

Liquid mass = 76.71 (gm) density = 2.51 (gm/cc) viscosity = 6.16 (log 10 poise) (analysis in wt %)
G = -1248250.57 (J) H = -994829.27 (J) S = 195.97 (J/K) V = 30.59 (cc) Cp = 103.10 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
66.64 1.02 18.77 0.45 0.00 2.27 0.08 0.40 0.00 0.00 1.43 2.54 4.98 0.12 1.31 0.00 0.00 0.00 0.00

orthopyroxene mass = 15.95 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.90Mg0.94Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -216869.56 (J) H = -171754.85 (J) S = 34.89 (J/K) V = 4.52 (cc) Cp = 18.50 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-101.19 97.62 90.10 9.43 -8.95 12.56 0.43

feldspar mass = 7.30 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -121308.30 (J) H = -98983.55 (J) S = 17.26 (J/K) V = 2.81 (cc) Cp = 8.96 (J/K)
albite anorthite sanidine
68.75 23.38 7.88

Total solids mass = 23.25 (gm) density = 3.17 (gm/cc)
G = -338177.86 (J) H = -270738.40 (J) S = 52.15 (J/K) V = 7.33 (cc) Cp = 27.46 (J/K)

Viscosity of the System: 6.59 (log 10 poise)

System mass = 99.96 (gm) density = 2.64 (gm/cc)
G = -1586428.43 (J) H = -1265567.67 (J) S = 248.12 (J/K) V = 37.92 (cc) Cp = 130.56 (J/K)

Oxygen delta moles = -0.0013182 delta grams = -0.0421807
G = 387.08 (J) H = -43.61 (J) S = -0.33 (J/K) V = -141.73 (cc) Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 1010.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.07 delta HM = -4.96 NNO = 0.00 QFM = 0.00 COH = 1.60 IW = 4.37

Constraint Flags: fO2 path = NNO

Liquid mass = 74.12 (gm) density = 2.50 (gm/cc) viscosity = 6.28 (log 10 poise) (analysis in wt %)
G = -1205638.95 (J) H = -963555.40 (J) S = 188.66 (J/K) V = 29.60 (cc) Cp = 99.49 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.94 | 1.05 | 18.69 | 0.42 | 0.00 | 2.09 | 0.08 | 0.37 | 0.00 | 0.00 | 1.36 | 2.40 | 5.11 | 0.12 | 1.36 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 0.36 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.57Mg0.36)3Al2Si3O12
G = -5054.09 (J) H = -4071.54 (J) S = 0.77 (J/K) V = 0.09 (cc) Cp = 0.40 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.73 | 7.64 | 35.63 |

orthopyroxene mass = 16.17 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg0.93Fe'"0.04Ti0.00Al0.22Si1.87O6
G = -218989.15 (J) H = -173808.43 (J) S = 35.21 (J/K) V = 4.58 (cc) Cp = 18.73 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.65 | 97.74 | 91.45 | 9.52 | -9.03 | 12.56 | 0.42 |

feldspar mass = 9.30 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.08Na0.69Ca0.23Al1.23Si2.77O8
G = -154210.70 (J) H = -126106.42 (J) S = 21.90 (J/K) V = 3.57 (cc) Cp = 11.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.12 | 22.56 | 8.32 |

Total solids mass = 25.84 (gm) density = 3.13 (gm/cc)
G = -378253.94 (J) H = -303986.39 (J) S = 57.88 (J/K) V = 8.25 (cc) Cp = 30.53 (J/K)

Viscosity of the System: 6.78 (log 10 poise)

System mass = 99.95 (gm) density = 2.64 (gm/cc)
G = -1583892.89 (J) H = -1267541.78 (J) S = 246.54 (J/K) V = 37.84 (cc) Cp = 130.02 (J/K)

Oxygen delta moles = -0.00143336 delta grams = -0.0458657

G = 417.28 (J)  H = -46.90 (J)  S = -0.36 (J/K)  V = -152.92 (cc)  Cp = -0.05 (J/K)

**********----------**********
Title: metapelite

T = 1000.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.22  delta HM = -4.97  NNO = 0.00  QFM = -0.00  COH = 1.58
IW = 4.39

Constraint Flags: fO2 path = NNO

Liquid  mass = 71.78 (gm)  density = 2.50 (gm/cc)  viscosity = 6.40 (log 10 poise)  (analysis in wt %)
G = -1167165.33 (J)  H = -935392.05 (J)  S = 182.05 (J/K)  V = 28.71 (cc)  Cp = 96.18 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.41 | 1.09 | 18.43 | 0.39 | 0.00 | 1.90 | 0.08 | 0.34 | 0.00 | 0.00 | 1.29 | 2.31 | 5.23 | 0.13 | 1.40 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 1.96 (gm)  density = 3.91 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.57Mg0.35)3Al2Si3O12
G = -27251.26 (J)  H = -22003.39 (J)  S = 4.12 (J/K)  V = 0.50 (cc)  Cp = 2.17 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.14 | 7.49 | 35.37 |

orthopyroxene  mass = 15.43 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.92Mg0.93Fe'"0.03Ti0.00Al0.22Si1.87O6
G = -208449.13 (J)  H = -165869.39 (J)  S = 33.44 (J/K)  V = 4.37 (cc)  Cp = 17.85 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.84 | 97.82 | 91.91 | 9.34 | -8.85 | 12.21 | 0.42 |

feldspar  mass = 10.78 (gm)  density = 2.60 (gm/cc)  (analysis in mole %)
K0.09Na0.70Ca0.21Al1.21Si2.79O8
G = -178480.52 (J)  H = -146263.76 (J)  S = 25.30 (J/K)  V = 4.15 (cc)  Cp = 13.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.72 | 21.35 | 8.94 |

Total solids  mass = 28.17 (gm)  density = 3.13 (gm/cc)
G = -414180.91 (J)  H = -334136.55 (J)  S = 62.87 (J/K)  V = 9.01 (cc)  Cp = 33.23 (J/K)

Viscosity of the System: 6.97 (log 10 poise)

System  mass = 99.95 (gm)  density = 2.65 (gm/cc)
G = -1581346.24 (J)  H = -1269528.60 (J)  S = 244.92 (J/K)  V = 37.73 (cc)  Cp = 129.41 (J/K)

Oxygen  delta moles = -0.00159929  delta grams = -0.0511753
G = 461.55 (J)  H = -51.76 (J)  S = -0.40 (J/K)  V = -169.29 (cc)  Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 990.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -10.38  delta HM = -4.98  NNO = 0.00  QFM = -0.01  COH = 1.55
IW = 4.40

Constraint Flags: fO2 path = NNO

Liquid mass = 69.60 (gm) density = 2.50 (gm/cc) viscosity = 6.53 (log 10 poise) (analysis in wt %)
G = -1131305.79 (J) H = -909141.56 (J) S = 175.88 (J/K) V = 27.89 (cc) Cp = 93.11 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.86 | 1.12 | 18.18 | 0.35 | 0.00 | 1.72 | 0.09 | 0.32 | 0.00 | 0.00 | 1.23 | 2.21 | 5.34 | 0.13 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 3.46 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.57Mg0.35)3Al2Si3O12
G = -48046.36 (J) H = -38883.58 (J) S = 7.25 (J/K) V = 0.88 (cc) Cp = 3.84 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.49 | 7.37 | 35.14 |

orthopyroxene mass = 14.70 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.92Mg0.93Fe'"0.03Ti0.00Al0.21Si1.88O6
G = -198196.36 (J) H = -158128.37 (J) S = 31.72 (J/K) V = 4.16 (cc) Cp = 16.99 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -102.84 | 97.88 | 92.20 | 9.15 | -8.65 | 11.84 | 0.41 |

feldspar mass = 12.18 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.70Ca0.20Al1.20Si2.80O8
G = -201274.60 (J) H = -165296.61 (J) S = 28.48 (J/K) V = 4.69 (cc) Cp = 14.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.18 | 20.25 | 9.57 |

Total solids mass = 30.34 (gm) density = 3.12 (gm/cc)
G = -447517.31 (J) H = -362308.57 (J) S = 67.46 (J/K) V = 9.73 (cc) Cp = 35.74 (J/K)

Viscosity of the System: 7.16 (log 10 poise)

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1578823.10 (J) H = -1271450.12 (J) S = 243.34 (J/K) V = 37.62 (cc) Cp = 128.85 (J/K)

Oxygen delta moles = -0.0017515 delta grams = -0.0560458
G = 501.07 (J) H = -56.06 (J) S = -0.44 (J/K) V = -183.95 (cc) Cp = -0.06 (J/K)

**********----------**********
Title: metapelite

T = 980.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.53 delta HM = -4.98 NNO = 0.00 QFM = -0.02 COH = 1.53 IW = 4.41

Constraint Flags: fO2 path = NNO

Liquid mass = 67.58 (gm) density = 2.49 (gm/cc) viscosity = 6.65 (log 10 poise) (analysis in wt %)
G = -1097878.91 (J) H = -884676.80 (J) S = 170.13 (J/K) V = 27.12 (cc) Cp = 90.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.29 | 1.16 | 17.93 | 0.32 | 0.00 | 1.55 | 0.09 | 0.30 | 0.00 | 0.00 | 1.18 | 2.11 | 5.45 | 0.13 | 1.49 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 4.87 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.58Mg0.35)3Al2Si3O12
G = -67524.87 (J) H = -54775.50 (J) S = 10.17 (J/K) V = 1.24 (cc) Cp = 5.40 (J/K)

almandine grossular pyrope
57.77 7.27 34.95

orthopyroxene mass = 13.99 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.92Mg0.93Fe'"0.03Ti0.00Al0.21Si1.88O6
G = -188265.27 (J) H = -150611.64 (J) S = 30.05 (J/K) V = 3.96 (cc) Cp = 16.15 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.65 97.94 92.34 8.96 -8.46 11.46 0.41

feldspar mass = 13.50 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.10Na0.71Ca0.19Al1.19Si2.81O8
G = -222653.78 (J) H = -183247.82 (J) S = 31.45 (J/K) V = 5.20 (cc) Cp = 16.51 (J/K)
albite anorthite sanidine
70.51 19.26 10.22

Total solids mass = 32.36 (gm) density = 3.11 (gm/cc)
G = -478443.91 (J) H = -388634.97 (J) S = 71.67 (J/K) V = 10.40 (cc) Cp = 38.06 (J/K)

Viscosity of the System: 7.35 (log 10 poise)

System mass = 99.94 (gm) density = 2.66 (gm/cc)
G = -1576322.82 (J) H = -1273311.76 (J) S = 241.80 (J/K) V = 37.52 (cc) Cp = 128.32 (J/K)

Oxygen delta moles = -0.0018904 delta grams = -0.0604907
G = 536.05 (J) H = -59.83 (J) S = -0.48 (J/K) V = -196.96 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 970.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.69 delta HM = -4.99 NNO = 0.00 QFM = -0.03 COH = 1.50 IW = 4.42

Constraint Flags: fO2 path = NNO

Liquid mass = 65.70 (gm) density = 2.49 (gm/cc) viscosity = 6.77 (log 10 poise) (analysis in wt %)
G = -1066692.42 (J) H = -861860.32 (J) S = 164.77 (J/K) V = 26.40 (cc) Cp = 87.61 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
68.71 1.19 17.68 0.29 0.00 1.40 0.09 0.29 0.00 0.00 1.14 2.01 5.54 0.14 1.53 0.00 0.00 0.00 0.00

garnet mass = 6.20 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.58Mg0.35)3Al2Si3O12
G = -85773.07 (J) H = -69743.34 (J) S = 12.89 (J/K) V = 1.58 (cc) Cp = 6.87 (J/K)
almandine grossular pyrope
58.00 7.20 34.80

orthopyroxene mass = 13.29 (gm) density = 3.54 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.92Mg0.94Fe'"0.03Ti0.00Al0.20Si1.88O6
G = -178679.24 (J) H = -143337.38 (J) S = 28.43 (J/K) V = 3.76 (cc) Cp = 15.34 (J/K)
diopside clinoenstatit hedenbergite alumino-buffo buffonite essenite jadeite
-102.31 97.99 92.34 8.76 -8.25 11.07 0.40

feldspar mass = 14.74 (gm) density = 2.60 (gm/cc) (analysis in mole %)

K0.11Na0.71Ca0.18Al1.18Si2.82O8
G = -242699.92 (J) H = -200177.73 (J) S = 34.21 (J/K) V = 5.68 (cc) Cp = 18.01 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.74 | 18.36 | 10.90 |

Total solids mass = 34.23 (gm) density = 3.11 (gm/cc)
G = -507152.23 (J) H = -413258.44 (J) S = 75.53 (J/K) V = 11.02 (cc) Cp = 40.22 (J/K)

Viscosity of the System: 7.54 (log 10 poise)

System mass = 99.94 (gm) density = 2.67 (gm/cc)
G = -1573844.65 (J) H = -1275118.77 (J) S = 240.30 (J/K) V = 37.42 (cc) Cp = 127.82 (J/K)

Oxygen delta moles = -0.0020166 delta grams = -0.0645288
G = 566.76 (J) H = -63.10 (J) S = -0.51 (J/K) V = -208.43 (cc) Cp = -0.07 (J/K)

**********----------**********
Title: metapelite

T = 960.00 (C) P = 8.000 (kbars) log(10) f O2 = -10.86 delta HM = -5.00 NNO = 0.00 QFM = -0.04 COH = 1.47 IW = 4.43

Constraint Flags: fO2 path = NNO

Liquid mass = 62.07 (gm) density = 2.48 (gm/cc) viscosity = 6.79 (log 10 poise) (analysis in wt %)
G = -1006649.45 (J) H = -815073.37 (J) S = 155.36 (J/K) V = 24.98 (cc) Cp = 82.73 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.69 | 1.26 | 17.57 | 0.27 | 0.00 | 1.26 | 0.10 | 0.27 | 0.00 | 0.00 | 1.10 | 1.95 | 5.77 | 0.15 | 1.62 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 8.54 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.58Mg0.35)3Al2Si3O12
G = -118044.80 (J) H = -96231.51 (J) S = 17.69 (J/K) V = 2.18 (cc) Cp = 9.45 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.82 | 7.14 | 35.04 |

orthopyroxene mass = 11.85 (gm) density = 3.53 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.91Mg0.95Fe'"0.03Ti0.00Al0.20Si1.89O6
G = -159509.33 (J) H = -128365.77 (J) S = 25.26 (J/K) V = 3.36 (cc) Cp = 13.69 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -100.89 | 98.01 | 91.29 | 8.55 | -8.01 | 10.65 | 0.41 |

feldspar mass = 16.10 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.12Na0.71Ca0.17Al1.17Si2.83O8
G = -264522.62 (J) H = -218633.38 (J) S = 37.21 (J/K) V = 6.21 (cc) Cp = 19.64 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.61 | 17.20 | 12.19 |

quartz mass = 1.37 (gm) density = 2.56 (gm/cc)
SiO2
G = -22644.45 (J) H = -18960.65 (J) S = 2.99 (J/K) V = 0.54 (cc) Cp = 1.62 (J/K)

Total solids mass = 37.86 (gm) density = 3.08 (gm/cc)

G = -564721.20 (J)  H = -462191.32 (J)  S = 83.14 (J/K)  V = 12.28 (cc)  Cp = 44.41 (J/K)

Viscosity of the System: 7.73 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.68 (gm/cc)
G = -1571370.65 (J)  H = -1277264.69 (J)  S = 238.50 (J/K)  V = 37.25 (cc)  Cp = 127.13 (J/K)

Oxygen  delta moles = -0.002166  delta grams = -0.0693095
G = 603.31 (J)  H = -67.00 (J)  S = -0.54 (J/K)  V = -222.08 (cc)  Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 950.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.02  delta HM = -5.00  NNO = 0.00  QFM = -0.05  COH = 1.45
IW = 4.45

Constraint Flags: fO2 path = NNO

Liquid  mass = 58.65 (gm)  density = 2.48 (gm/cc)  viscosity = 6.81 (log 10 poise)  (analysis in wt %)
G = -950148.23 (J)  H = -770924.84 (J)  S = 146.53 (J/K)  V = 23.63 (cc)  Cp = 78.14 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.65 | 1.34 | 17.46 | 0.24 | 0.00 | 1.13 | 0.10 | 0.27 | 0.00 | 0.00 | 1.06 | 1.89 | 5.98 | 0.15 | 1.72 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 10.69 (gm)  density = 3.92 (gm/cc)  (analysis in mole %)
(Ca0.07Fe"0.58Mg0.35)3Al2Si3O12
G = -147659.00 (J)  H = -120686.66 (J)  S = 22.05 (J/K)  V = 2.72 (cc)  Cp = 11.83 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.58 | 7.12 | 35.30 |

orthopyroxene  mass = 10.51 (gm)  density = 3.53 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.90Mg0.97Fe'"0.02Ti0.00Al0.19Si1.89O6
G = -141675.58 (J)  H = -114380.85 (J)  S = 22.32 (J/K)  V = 2.98 (cc)  Cp = 12.15 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -99.31 | 98.01 | 90.10 | 8.33 | -7.76 | 10.21 | 0.41 |

feldspar  mass = 17.42 (gm)  density = 2.59 (gm/cc)  (analysis in mole %)
K0.14Na0.70Ca0.16Al1.16Si2.84O8
G = -285562.04 (J)  H = -236516.14 (J)  S = 40.10 (J/K)  V = 6.72 (cc)  Cp = 21.23 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.25 | 16.09 | 13.66 |

quartz  mass = 2.66 (gm)  density = 2.56 (gm/cc)
SiO2
G = -43879.99 (J)  H = -36821.48 (J)  S = 5.77 (J/K)  V = 1.04 (cc)  Cp = 3.14 (J/K)

Total solids  mass = 41.28 (gm)  density = 3.07 (gm/cc)
G = -618776.62 (J)  H = -508405.13 (J)  S = 90.24 (J/K)  V = 13.47 (cc)  Cp = 48.35 (J/K)

Viscosity of the System: 7.93 (log 10 poise)

System  mass = 99.93 (gm)  density = 2.69 (gm/cc)
G = -1568924.85 (J)  H = -1279329.97 (J)  S = 236.76 (J/K)  V = 37.10 (cc)  Cp = 126.49 (J/K)

Oxygen delta moles = -0.00229599 delta grams = -0.073469
G = 633.76 (J) H = -70.20 (J) S = -0.58 (J/K) V = -233.49 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 940.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.19 delta HM = -5.01 NNO = 0.00 QFM = -0.06 COH = 1.42 IW = 4.46

Constraint Flags: fO2 path = NNO

Liquid mass = 55.00 (gm) density = 2.48 (gm/cc) viscosity = 6.83 (log 10 poise) (analysis in wt %)
G = -890564.36 (J) H = -724092.04 (J) S = 137.22 (J/K) V = 22.21 (cc) Cp = 73.27 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.71 | 1.26 | 17.40 | 0.22 | 0.00 | 0.99 | 0.11 | 0.26 | 0.00 | 0.00 | 1.03 | 1.84 | 6.19 | 0.16 | 1.83 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 12.71 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.57Mg0.36)3Al2Si3O12
G = -175634.19 (J) H = -143945.35 (J) S = 26.12 (J/K) V = 3.24 (cc) Cp = 14.06 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 57.05 | 7.14 | 35.81 |

orthopyroxene mass = 9.09 (gm) density = 3.52 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.88Mg0.99Fe'"0.02Ti0.00Al0.18Si1.90O6
G = -122903.86 (J) H = -99573.42 (J) S = 19.23 (J/K) V = 2.58 (cc) Cp = 10.52 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -96.89 | 97.99 | 88.20 | 8.04 | -7.49 | 9.73 | 0.41 |

feldspar mass = 18.90 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.69Ca0.15Al1.15Si2.85O8
G = -309067.20 (J) H = -256512.29 (J) S = 43.32 (J/K) V = 7.30 (cc) Cp = 23.00 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.35 | 14.96 | 15.69 |

quartz mass = 4.02 (gm) density = 2.56 (gm/cc)
SiO2
G = -66300.01 (J) H = -55755.66 (J) S = 8.69 (J/K) V = 1.57 (cc) Cp = 4.75 (J/K)

rhm-oxide mass = 0.20 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.69Mg0.13Fe'"0.14Al0.18Ti0.84O3
G = -2052.94 (J) H = -1581.52 (J) S = 0.39 (J/K) V = 0.04 (cc) Cp = 0.19 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.67 | 6.94 | 69.19 | 2.06 | 9.13 |

Total solids mass = 44.92 (gm) density = 3.05 (gm/cc)
G = -675958.18 (J) H = -557368.24 (J) S = 97.75 (J/K) V = 14.74 (cc) Cp = 52.53 (J/K)

Viscosity of the System: 8.22 (log 10 poise)

System mass = 99.92 (gm) density = 2.70 (gm/cc)
G = -1566522.54 (J) H = -1281460.28 (J) S = 234.98 (J/K) V = 36.95 (cc) Cp = 125.80 (J/K)

Oxygen delta moles = -0.002378 delta grams = -0.0760931
G = 650.44 (J) H = -71.86 (J) S = -0.60 (J/K) V = -239.86 (cc) Cp = -0.08 (J/K)

**********----------**********
Title: metapelite

T = 930.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.36 delta HM = -5.02 NNO = 0.00 QFM = -0.07 COH = 1.39 IW = 4.47

Constraint Flags: fO2 path = NNO

Liquid mass = 51.56 (gm) density = 2.47 (gm/cc) viscosity = 6.84 (log 10 poise) (analysis in wt %)
G = -834270.15 (J) H = -679683.57 (J) S = 128.48 (J/K) V = 20.86 (cc) Cp = 68.68 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.73 | 1.22 | 17.32 | 0.20 | 0.00 | 0.88 | 0.11 | 0.25 | 0.00 | 0.00 | 1.02 | 1.79 | 6.35 | 0.18 | 1.95 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 14.60 (gm) density = 3.92 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.56Mg0.36)3Al2Si3O12
G = -201855.10 (J) H = -165889.11 (J) S = 29.89 (J/K) V = 3.73 (cc) Cp = 16.16 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 56.49 | 7.20 | 36.30 |

orthopyroxene mass = 7.77 (gm) density = 3.51 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.86Mg1.02Fe'"0.02Ti0.00Al0.17Si1.90O6
G = -105507.77 (J) H = -85778.27 (J) S = 16.40 (J/K) V = 2.21 (cc) Cp = 9.01 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -94.41 | 97.96 | 86.23 | 7.76 | -7.22 | 9.26 | 0.41 |

feldspar mass = 20.37 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.18Na0.68Ca0.14Al1.14Si2.86O8
G = -332174.27 (J) H = -276255.57 (J) S = 46.48 (J/K) V = 7.88 (cc) Cp = 24.74 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.13 | 13.79 | 18.08 |

quartz mass = 5.28 (gm) density = 2.56 (gm/cc)
SiO2
G = -86847.36 (J) H = -73193.13 (J) S = 11.35 (J/K) V = 2.06 (cc) Cp = 6.23 (J/K)

rhm-oxide mass = 0.34 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.69Mg0.13Fe'"0.13Al0.18Ti0.84O3
G = -3485.36 (J) H = -2694.74 (J) S = 0.66 (J/K) V = 0.07 (cc) Cp = 0.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.09 | 6.64 | 69.16 | 2.23 | 8.89 |

Total solids mass = 48.36 (gm) density = 3.03 (gm/cc)
G = -729869.86 (J) H = -603810.81 (J) S = 104.77 (J/K) V = 15.96 (cc) Cp = 56.47 (J/K)

Viscosity of the System: 8.59 (log 10 poise)

System mass = 99.92 (gm) density = 2.71 (gm/cc)
G = -1564140.01 (J) H = -1283494.38 (J) S = 233.26 (J/K) V = 36.82 (cc) Cp = 125.15 (J/K)

Oxygen delta moles = -0.00245552 delta grams = -0.0785736
G = 665.50 (J) H = -73.33 (J) S = -0.61 (J/K) V = -245.63 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 920.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.53 delta HM = -5.03 NNO = 0.00 QFM = -0.08 COH = 1.36 IW = 4.49

Constraint Flags: fO2 path = NNO

Liquid mass = 48.12 (gm) density = 2.47 (gm/cc) viscosity = 6.83 (log 10 poise) (analysis in wt %)
G = -778205.08 (J) H = -635219.64 (J) S = 119.84 (J/K) V = 19.51 (cc) Cp = 64.12 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.74 | 1.18 | 17.24 | 0.18 | 0.00 | 0.78 | 0.11 | 0.25 | 0.00 | 0.00 | 1.01 | 1.76 | 6.47 | 0.19 | 2.09 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 16.42 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.56Mg0.37)3Al2Si3O12
G = -227263.71 (J) H = -187289.92 (J) S = 33.50 (J/K) V = 4.20 (cc) Cp = 18.18 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.84 | 7.31 | 36.85 |

orthopyroxene mass = 6.49 (gm) density = 3.50 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.84Mg1.04Fe'"0.02Ti0.00Al0.17Si1.91O6
G = -88497.51 (J) H = -72205.24 (J) S = 13.65 (J/K) V = 1.85 (cc) Cp = 7.54 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -91.66 | 97.92 | 84.01 | 7.47 | -6.94 | 8.78 | 0.42 |

feldspar mass = 21.92 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.21Na0.66Ca0.13Al1.13Si2.87O8
G = -356263.92 (J) H = -296892.36 (J) S = 49.76 (J/K) V = 8.49 (cc) Cp = 26.56 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.45 | 12.55 | 21.00 |

quartz mass = 6.49 (gm) density = 2.56 (gm/cc)
SiO2
G = -106696.93 (J) H = -90115.91 (J) S = 13.90 (J/K) V = 2.54 (cc) Cp = 7.65 (J/K)

rhm-oxide mass = 0.47 (gm) density = 4.56 (gm/cc) (analysis in mole %)
Mn0.02Fe"0.69Mg0.14Fe'"0.13Al0.17Ti0.85O3
G = -4852.94 (J) H = -3765.89 (J) S = 0.91 (J/K) V = 0.10 (cc) Cp = 0.45 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 13.57 | 6.33 | 69.06 | 2.39 | 8.65 |

Total solids mass = 51.80 (gm) density = 3.01 (gm/cc)
G = -783575.01 (J) H = -650269.31 (J) S = 111.73 (J/K) V = 17.18 (cc) Cp = 60.39 (J/K)

Viscosity of the System: 9.22 (log 10 poise)

System mass = 99.92 (gm) density = 2.72 (gm/cc)
G = -1561780.09 (J) H = -1285488.95 (J) S = 231.56 (J/K) V = 36.69 (cc) Cp = 124.51 (J/K)

Oxygen delta moles = -0.00252271 delta grams = -0.0807237
G = 677.41 (J) H = -74.43 (J) S = -0.63 (J/K) V = -250.26 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 910.00 (C) P = 8.000 (kbars) log(10) f O2 = -11.71 delta HM = -5.03 NNO = 0.00 QFM = -0.09 COH = 1.34 IW = 4.50

Constraint Flags: fO2 path = NNO

Liquid mass = 44.51 (gm) density = 2.46 (gm/cc) viscosity = 6.80 (log 10 poise) (analysis in wt %)
G = -719643.41 (J) H = -588447.15 (J) S = 110.89 (J/K) V = 18.08 (cc) Cp = 59.34 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.75 | 1.13 | 17.14 | 0.16 | 0.00 | 0.69 | 0.12 | 0.25 | 0.00 | 0.00 | 1.02 | 1.76 | 6.51 | 0.20 | 2.26 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 18.24 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.55Mg0.37)3Al2Si3O12
G = -252656.19 (J) H = -208805.60 (J) S = 37.06 (J/K) V = 4.67 (cc) Cp = 20.19 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.06 | 7.45 | 37.50 |

orthopyroxene mass = 5.21 (gm) density = 3.49 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.81Mg1.07Fe'"0.02Ti0.00Al0.16Si1.91O6
G = -71310.44 (J) H = -58395.41 (J) S = 10.92 (J/K) V = 1.49 (cc) Cp = 6.06 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -88.56 | 97.86 | 81.44 | 7.19 | -6.65 | 8.31 | 0.43 |

feldspar mass = 22.07 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.23Na0.65Ca0.12Al1.12Si2.88O8
G = -357834.70 (J) H = -298832.45 (J) S = 49.87 (J/K) V = 8.56 (cc) Cp = 26.71 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 65.13 | 11.69 | 23.19 |

feldspar mass = 1.57 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.47Na0.48Ca0.05Al1.05Si2.95O8
G = -25100.64 (J) H = -20939.83 (J) S = 3.52 (J/K) V = 0.61 (cc) Cp = 1.88 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 48.28 | 4.85 | 46.87 |

quartz mass = 7.72 (gm) density = 2.56 (gm/cc)
SiO2
G = -126663.35 (J) H = -107209.64 (J) S = 16.44 (J/K) V = 3.01 (cc) Cp = 9.09 (J/K)

rhm-oxide mass = 0.60 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.69Mg0.14Fe'"0.12Al0.17Ti0.86O3
G = -6233.36 (J) H = -4855.29 (J) S = 1.16 (J/K) V = 0.13 (cc) Cp = 0.58 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.12 | 6.01 | 68.87 | 2.55 | 8.45 |

Total solids mass = 55.40 (gm) density = 3.00 (gm/cc)

G = -839798.68 (J)  H = -699038.23 (J)  S = 118.97 (J/K)  V = 18.48 (cc)  Cp = 64.51 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.92 (gm)  density = 2.73 (gm/cc)
G = -1559442.09 (J)  H = -1287485.38 (J)  S = 229.86 (J/K)  V = 36.56 (cc)  Cp = 123.85 (J/K)

Oxygen  delta moles = -0.00258059  delta grams = -0.0825759
G = 686.51 (J)  H = -75.22 (J)  S = -0.64 (J/K)  V = -253.85 (cc)  Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 900.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -11.89  delta HM = -5.04  NNO = 0.00  QFM = -0.10  COH = 1.31
IW = 4.51

Constraint Flags: fO2 path = NNO

Liquid  mass = 40.81 (gm)  density = 2.46 (gm/cc)  viscosity = 6.74 (log 10 poise)  (analysis in wt %)
G = -659743.70 (J)  H = -540311.69 (J)  S = 101.80 (J/K)  V = 16.62 (cc)  Cp = 54.45 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.76 | 1.07 | 17.05 | 0.15 | 0.00 | 0.62 | 0.12 | 0.25 | 0.00 | 0.00 | 1.03 | 1.81 | 6.45 | 0.22 | 2.47 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 19.93 (gm)  density = 3.90 (gm/cc)  (analysis in mole %)
(Ca0.08Fe"0.54Mg0.38)3Al2Si3O12
G = -276551.37 (J)  H = -229202.82 (J)  S = 40.36 (J/K)  V = 5.11 (cc)  Cp = 22.08 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 54.22 | 7.54 | 38.24 |

orthopyroxene  mass = 3.98 (gm)  density = 3.48 (gm/cc)  (analysis in mole %)
opx Na0.00Ca0.02Fe"0.79Mg1.11Fe'"0.01Ti0.00Al0.15Si1.92O6
G = -54850.99 (J)  H = -45082.81 (J)  S = 8.33 (J/K)  V = 1.14 (cc)  Cp = 4.65 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -85.33 | 97.81 | 78.68 | 6.92 | -6.38 | 7.86 | 0.44 |

feldspar  mass = 18.68 (gm)  density = 2.58 (gm/cc)  (analysis in mole %)
K0.22Na0.66Ca0.12Al1.12Si2.88O8
G = -302683.45 (J)  H = -253381.34 (J)  S = 42.03 (J/K)  V = 7.23 (cc)  Cp = 22.60 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 66.21 | 12.19 | 21.60 |

feldspar  mass = 6.84 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.49Na0.47Ca0.04Al1.04Si2.96O8
G = -109178.17 (J)  H = -91286.58 (J)  S = 15.25 (J/K)  V = 2.68 (cc)  Cp = 8.18 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 46.62 | 4.37 | 49.01 |

quartz  mass = 8.94 (gm)  density = 2.56 (gm/cc)
SiO2
G = -146499.00 (J)  H = -124264.84 (J)  S = 18.95 (J/K)  V = 3.49 (cc)  Cp = 10.52 (J/K)

rhm-oxide  mass = 0.74 (gm)  density = 4.55 (gm/cc)  (analysis in mole %)

Mn0.03Fe"0.69Mg0.15Fe'"0.11Al0.17Ti0.86O3
G = -7620.42 (J) H = -5958.32 (J) S = 1.42 (J/K) V = 0.16 (cc) Cp = 0.71 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 14.72 | 5.69 | 68.62 | 2.70 | 8.27 |

Total solids mass = 59.11 (gm) density = 2.98 (gm/cc)
G = -897383.41 (J) H = -749176.70 (J) S = 126.33 (J/K) V = 19.82 (cc) Cp = 68.73 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.92 (gm) density = 2.74 (gm/cc)
G = -1557127.11 (J) H = -1289488.39 (J) S = 228.14 (J/K) V = 36.44 (cc) Cp = 123.19 (J/K)

Oxygen delta moles = -0.00262775 delta grams = -0.0840849
G = 692.50 (J) H = -75.66 (J) S = -0.65 (J/K) V = -256.31 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 890.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.07 delta HM = -5.05 NNO = 0.00 QFM = -0.11 COH = 1.28 IW = 4.53

Constraint Flags: fO2 path = NNO

Liquid mass = 37.52 (gm) density = 2.45 (gm/cc) viscosity = 6.67 (log 10 poise) (analysis in wt %)
G = -606657.97 (J) H = -497590.18 (J) S = 93.77 (J/K) V = 15.31 (cc) Cp = 50.13 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.75 | 1.02 | 16.95 | 0.13 | 0.00 | 0.56 | 0.13 | 0.25 | 0.00 | 0.00 | 1.04 | 1.86 | 6.39 | 0.24 | 2.68 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 21.39 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.53Mg0.39)3Al2Si3O12
G = -297226.35 (J) H = -247028.58 (J) S = 43.16 (J/K) V = 5.49 (cc) Cp = 23.71 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.43 | 7.63 | 38.95 |

orthopyroxene mass = 2.93 (gm) density = 3.47 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.76Mg1.14Fe'"0.01Ti0.00Al0.15Si1.92O6
G = -40557.30 (J) H = -33455.06 (J) S = 6.11 (J/K) V = 0.84 (cc) Cp = 3.43 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -82.23 | 97.76 | 76.03 | 6.67 | -6.12 | 7.44 | 0.44 |

feldspar mass = 16.59 (gm) density = 2.58 (gm/cc) (analysis in mole %)
K0.20Na0.67Ca0.13Al1.13Si2.87O8
G = -268589.95 (J) H = -225374.82 (J) S = 37.15 (J/K) V = 6.42 (cc) Cp = 20.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.14 | 12.59 | 20.27 |

feldspar mass = 10.60 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.51Na0.45Ca0.04Al1.04Si2.96O8
G = -168841.40 (J) H = -141493.26 (J) S = 23.51 (J/K) V = 4.16 (cc) Cp = 12.66 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 45.17 | 3.97 | 50.86 |

quartz mass = 10.03 (gm) density = 2.56 (gm/cc)
SiO2
G = -164150.23 (J) H = -139535.03 (J) S = 21.16 (J/K) V = 3.92 (cc) Cp = 11.79 (J/K)

rhm-oxide mass = 0.85 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.15Fe'"0.11Al0.16Ti0.87O3
G = -8810.40 (J) H = -6914.59 (J) S = 1.63 (J/K) V = 0.19 (cc) Cp = 0.81 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.31 | 5.39 | 68.35 | 2.85 | 8.10 |

Total solids mass = 62.39 (gm) density = 2.97 (gm/cc)
G = -948175.63 (J) H = -793801.34 (J) S = 132.72 (J/K) V = 21.01 (cc) Cp = 72.47 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.75 (gm/cc)
G = -1554833.60 (J) H = -1291391.52 (J) S = 226.49 (J/K) V = 36.33 (cc) Cp = 122.59 (J/K)

Oxygen delta moles = -0.00266622 delta grams = -0.0853159
G = 696.00 (J) H = -75.82 (J) S = -0.66 (J/K) V = -257.84 (cc) Cp = -0.09 (J/K)

**********----------**********
Title: metapelite

T = 880.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.26 delta HM = -5.06 NNO = 0.00 QFM = -0.12 COH = 1.25 IW = 4.54

Constraint Flags: fO2 path = NNO

Liquid mass = 34.59 (gm) density = 2.44 (gm/cc) viscosity = 6.60 (log 10 poise) (analysis in wt %)
G = -559201.91 (J) H = -459339.23 (J) S = 86.60 (J/K) V = 14.15 (cc) Cp = 46.26 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.72 | 0.96 | 16.86 | 0.12 | 0.00 | 0.50 | 0.13 | 0.25 | 0.00 | 0.00 | 1.06 | 1.91 | 6.31 | 0.26 | 2.91 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 22.67 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.53Mg0.40)3Al2Si3O12
G = -315281.60 (J) H = -262759.92 (J) S = 45.55 (J/K) V = 5.82 (cc) Cp = 25.13 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.68 | 7.70 | 39.63 |

orthopyroxene mass = 2.02 (gm) density = 3.46 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.73Mg1.16Fe'"0.01Ti0.00Al0.14Si1.92O6
G = -28026.01 (J) H = -23200.00 (J) S = 4.19 (J/K) V = 0.58 (cc) Cp = 2.36 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -79.27 | 97.73 | 73.47 | 6.43 | -5.87 | 7.06 | 0.45 |

feldspar mass = 15.21 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.19Na0.68Ca0.13Al1.13Si2.87O8
G = -246123.48 (J) H = -207009.17 (J) S = 33.92 (J/K) V = 5.88 (cc) Cp = 18.40 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 67.98 | 12.90 | 19.13 |

feldspar mass = 13.47 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.53Na0.44Ca0.04Al1.04Si2.96O8
G = -214088.98 (J) H = -179820.02 (J) S = 29.72 (J/K) V = 5.29 (cc) Cp = 16.06 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 43.86 | 3.62 | 52.53 |

quartz mass = 11.01 (gm) density = 2.56 (gm/cc)
SiO2
G = -180001.42 (J) H = -153335.68 (J) S = 23.12 (J/K) V = 4.30 (cc) Cp = 12.93 (J/K)

rhm-oxide mass = 0.95 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.16Fe'"0.10Al0.16Ti0.87O3
G = -9836.37 (J) H = -7748.36 (J) S = 1.81 (J/K) V = 0.21 (cc) Cp = 0.91 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 15.89 | 5.11 | 68.08 | 2.98 | 7.94 |

Total solids mass = 65.32 (gm) density = 2.96 (gm/cc)
G = -993357.86 (J) H = -833873.15 (J) S = 138.30 (J/K) V = 22.08 (cc) Cp = 75.79 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.76 (gm/cc)
G = -1552559.77 (J) H = -1293212.38 (J) S = 224.90 (J/K) V = 36.23 (cc) Cp = 122.05 (J/K)

Oxygen delta moles = -0.0026981 delta grams = -0.086336
G = 697.61 (J) H = -75.77 (J) S = -0.67 (J/K) V = -258.68 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 870.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.45 delta HM = -5.07 NNO = 0.00 QFM = -0.13 COH = 1.22 IW = 4.56

Constraint Flags: fO2 path = NNO

Liquid mass = 31.94 (gm) density = 2.44 (gm/cc) viscosity = 6.52 (log 10 poise) (analysis in wt %)
G = -516443.26 (J) H = -424815.94 (J) S = 80.15 (J/K) V = 13.10 (cc) Cp = 42.77 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.66 | 0.90 | 16.77 | 0.11 | 0.00 | 0.45 | 0.14 | 0.25 | 0.00 | 0.00 | 1.07 | 1.97 | 6.24 | 0.28 | 3.15 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.79 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.52Mg0.40)3Al2Si3O12
G = -331182.00 (J) H = -276766.60 (J) S = 47.60 (J/K) V = 6.11 (cc) Cp = 26.38 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.96 | 7.76 | 40.28 |

orthopyroxene mass = 1.21 (gm) density = 3.45 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.71Mg1.19Fe'"0.01Ti0.00Al0.13Si1.93O6
G = -16944.98 (J) H = -14075.73 (J) S = 2.51 (J/K) V = 0.35 (cc) Cp = 1.42 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -76.44 | 97.70 | 70.99 | 6.21 | -5.64 | 6.71 | 0.46 |

feldspar mass = 14.28 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.18Na0.69Ca0.13Al1.13Si2.87O8
G = -230823.80 (J) H = -194594.50 (J) S = 31.69 (J/K) V = 5.52 (cc) Cp = 17.27 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 68.75 | 13.14 | 18.11 |

feldspar mass = 15.76 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.54Na0.43Ca0.03Al1.03Si2.97O8
G = -249829.59 (J) H = -210317.21 (J) S = 34.56 (J/K) V = 6.19 (cc) Cp = 18.76 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 42.64 | 3.31 | 54.05 |

quartz mass = 11.90 (gm) density = 2.56 (gm/cc)
SiO2
G = -194356.21 (J) H = -165916.13 (J) S = 24.88 (J/K) V = 4.65 (cc) Cp = 13.97 (J/K)

rhm-oxide mass = 1.04 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.16Fe'"0.10Al0.16Ti0.87O3
G = -10724.44 (J) H = -8478.74 (J) S = 1.96 (J/K) V = 0.23 (cc) Cp = 0.99 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 16.46 | 4.85 | 67.80 | 3.11 | 7.78 |

Total solids mass = 67.97 (gm) density = 2.95 (gm/cc)
G = -1033861.01 (J) H = -870148.91 (J) S = 143.21 (J/K) V = 23.04 (cc) Cp = 78.79 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.76 (gm/cc)
G = -1550304.27 (J) H = -1294964.85 (J) S = 223.36 (J/K) V = 36.14 (cc) Cp = 121.56 (J/K)

Oxygen delta moles = -0.00272492 delta grams = -0.087194
G = 697.77 (J) H = -75.56 (J) S = -0.68 (J/K) V = -258.99 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 860.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.64 delta HM = -5.08 NNO = 0.00 QFM = -0.14 COH = 1.19 IW = 4.57

Constraint Flags: fO2 path = NNO

Liquid mass = 29.54 (gm) density = 2.43 (gm/cc) viscosity = 6.42 (log 10 poise) (analysis in wt %)
G = -477635.82 (J) H = -393425.24 (J) S = 74.32 (J/K) V = 12.14 (cc) Cp = 39.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.58 | 0.85 | 16.68 | 0.10 | 0.00 | 0.41 | 0.14 | 0.25 | 0.00 | 0.00 | 1.08 | 2.04 | 6.15 | 0.31 | 3.41 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.78 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.41)3Al2Si3O12
G = -345293.16 (J) H = -289339.80 (J) S = 49.38 (J/K) V = 6.38 (cc) Cp = 27.48 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.28 | 7.82 | 40.90 |

orthopyroxene mass = 0.50 (gm) density = 3.44 (gm/cc) (analysis in mole %)
opx Na0.00Ca0.02Fe"0.69Mg1.22Fe'"0.01Ti0.00Al0.13Si1.93O6
G = -7068.65 (J) H = -5891.71 (J) S = 1.04 (J/K) V = 0.15 (cc) Cp = 0.59 (J/K)

| diopside | clinoenstatit | hedenbergite | alumino-buffo | buffonite | essenite | jadeite |
|---|---|---|---|---|---|---|
| -73.73 | 97.68 | 68.60 | 6.00 | -5.42 | 6.39 | 0.47 |

feldspar mass = 13.64 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.17Na0.69Ca0.13Al1.13Si2.87O8
G = -220263.55 (J) H = -186122.77 (J) S = 30.13 (J/K) V = 5.26 (cc) Cp = 16.49 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 69.47 | 13.33 | 17.20 |

feldspar mass = 17.62 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.55Na0.42Ca0.03Al1.03Si2.97O8
G = -278850.61 (J) H = -235282.36 (J) S = 38.45 (J/K) V = 6.92 (cc) Cp = 20.96 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 41.50 | 3.03 | 55.47 |

quartz mass = 12.72 (gm) density = 2.56 (gm/cc)
SiO2
G = -207458.78 (J) H = -177477.05 (J) S = 26.46 (J/K) V = 4.97 (cc) Cp = 14.91 (J/K)

rhm-oxide mass = 1.11 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.68Mg0.17Fe'"0.09Al0.15Ti0.88O3
G = -11495.46 (J) H = -9121.05 (J) S = 2.10 (J/K) V = 0.24 (cc) Cp = 1.05 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.01 | 4.61 | 67.52 | 3.23 | 7.63 |

Total solids mass = 70.37 (gm) density = 2.94 (gm/cc)
G = -1070430.22 (J) H = -903234.74 (J) S = 147.55 (J/K) V = 23.92 (cc) Cp = 81.50 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.77 (gm/cc)
G = -1548066.05 (J) H = -1296659.98 (J) S = 221.86 (J/K) V = 36.06 (cc) Cp = 121.11 (J/K)

Oxygen delta moles = -0.0027478 delta grams = -0.0879262
G = 696.81 (J) H = -75.22 (J) S = -0.68 (J/K) V = -258.88 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 850.00 (C) P = 8.000 (kbars) log(10) f O2 = -12.84 delta HM = -5.08 NNO = 0.00 QFM = -0.15 COH = 1.15 IW = 4.58

Constraint Flags: fO2 path = NNO

Liquid mass = 27.42 (gm) density = 2.43 (gm/cc) viscosity = 6.33 (log 10 poise) (analysis in wt %)
G = -443355.62 (J) H = -365686.86 (J) S = 69.15 (J/K) V = 11.30 (cc) Cp = 36.82 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.44 | 0.80 | 16.65 | 0.09 | 0.00 | 0.37 | 0.15 | 0.25 | 0.00 | 0.00 | 1.10 | 2.09 | 6.06 | 0.33 | 3.67 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.49 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.41)3Al2Si3O12
G = -355377.50 (J) H = -298569.74 (J) S = 50.58 (J/K) V = 6.56 (cc) Cp = 28.26 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.76 | 7.86 | 41.38 |

feldspar mass = 13.34 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.16Na0.70Ca0.14Al1.14Si2.86O8
G = -215270.91 (J) H = -182325.38 (J) S = 29.33 (J/K) V = 5.15 (cc) Cp = 16.13 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.14 | 13.55 | 16.32 |

feldspar mass = 19.06 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.57Na0.40Ca0.03Al1.03Si2.97O8
G = -300945.38 (J) H = -254502.57 (J) S = 41.35 (J/K) V = 7.49 (cc) Cp = 22.65 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 40.34 | 2.78 | 56.88 |

quartz mass = 13.43 (gm) density = 2.56 (gm/cc)
SiO2
G = -218755.82 (J) H = -187537.22 (J) S = 27.80 (J/K) V = 5.25 (cc) Cp = 15.73 (J/K)

rhm-oxide mass = 1.17 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.67Mg0.17Fe'"0.09Al0.15Ti0.88O3
G = -12139.37 (J) H = -9665.96 (J) S = 2.20 (J/K) V = 0.26 (cc) Cp = 1.11 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.47 | 4.37 | 67.29 | 3.33 | 7.53 |

Total solids mass = 72.49 (gm) density = 2.93 (gm/cc)
G = -1102488.98 (J) H = -932600.86 (J) S = 151.26 (J/K) V = 24.70 (cc) Cp = 83.89 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1545844.60 (J) H = -1298287.72 (J) S = 220.41 (J/K) V = 36.00 (cc) Cp = 120.71 (J/K)

Oxygen delta moles = -0.00276701 delta grams = -0.088541
G = 694.83 (J) H = -74.77 (J) S = -0.69 (J/K) V = -258.39 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 840.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.04 delta HM = -5.09 NNO = 0.00 QFM = -0.16 COH = 1.12 IW = 4.60

Constraint Flags: fO2 path = NNO

Liquid mass = 25.73 (gm) density = 2.42 (gm/cc) viscosity = 6.27 (log 10 poise) (analysis in wt %)
G = -415956.42 (J) H = -343636.60 (J) S = 64.97 (J/K) V = 10.62 (cc) Cp = 34.60 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 68.17 | 0.75 | 16.84 | 0.08 | 0.00 | 0.33 | 0.15 | 0.23 | 0.00 | 0.00 | 1.10 | 2.08 | 6.00 | 0.35 | 3.91 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.52 (gm) density = 3.88 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.41)3Al2Si3O12
G = -355403.40 (J) H = -299303.47 (J) S = 50.40 (J/K) V = 6.57 (cc) Cp = 28.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.73 | 7.87 | 41.40 |

feldspar mass = 13.65 (gm) density = 2.59 (gm/cc) (analysis in mole %)
K0.15Na0.71Ca0.14Al1.14Si2.86O8
G = -220093.29 (J) H = -186845.08 (J) S = 29.87 (J/K) V = 5.26 (cc) Cp = 16.51 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 70.69 | 13.96 | 15.34 |

feldspar mass = 19.87 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.58Na0.39Ca0.03Al1.03Si2.97O8
G = -313029.10 (J) H = -265324.70 (J) S = 42.86 (J/K) V = 7.80 (cc) Cp = 23.58 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 38.95 | 2.55 | 58.50 |

quartz mass = 13.93 (gm) density = 2.56 (gm/cc)
SiO2
G = -226543.36 (J) H = -194622.88 (J) S = 28.68 (J/K) V = 5.44 (cc) Cp = 16.29 (J/K)

rhm-oxide mass = 1.22 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.67Mg0.18Fe'"0.08Al0.15Ti0.88O3
G = -12613.67 (J) H = -10077.56 (J) S = 2.28 (J/K) V = 0.27 (cc) Cp = 1.15 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.56 | 4.13 | 67.29 | 3.41 | 7.61 |

Total solids mass = 74.18 (gm) density = 2.93 (gm/cc)
G = -1127682.82 (J) H = -956173.68 (J) S = 154.08 (J/K) V = 25.34 (cc) Cp = 85.81 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1543639.25 (J) H = -1299810.29 (J) S = 219.04 (J/K) V = 35.96 (cc) Cp = 120.42 (J/K)

Oxygen delta moles = -0.00278231 delta grams = -0.0890307
G = 691.79 (J) H = -74.20 (J) S = -0.69 (J/K) V = -257.50 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 830.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.24 delta HM = -5.10 NNO = 0.00 QFM = -0.17 COH = 1.09 IW = 4.62

Constraint Flags: fO2 path = NNO

Liquid mass = 24.15 (gm) density = 2.42 (gm/cc) viscosity = 6.20 (log 10 poise) (analysis in wt %)
G = -390465.04 (J) H = -323078.54 (J) S = 61.09 (J/K) V = 9.98 (cc) Cp = 32.54 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.87 | 0.71 | 17.04 | 0.08 | 0.00 | 0.29 | 0.16 | 0.22 | 0.00 | 0.00 | 1.10 | 2.06 | 5.93 | 0.38 | 4.17 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.55 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.41)3Al2Si3O12
G = -355294.38 (J) H = -299921.79 (J) S = 50.19 (J/K) V = 6.58 (cc) Cp = 28.27 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.70 | 7.88 | 41.42 |

feldspar mass = 13.98 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.71Ca0.14Al1.14Si2.86O8
G = -225218.45 (J) H = -191639.85 (J) S = 30.44 (J/K) V = 5.38 (cc) Cp = 16.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.20 | 14.34 | 14.46 |

feldspar mass = 20.58 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.60Na0.38Ca0.02Al1.02Si2.98O8
G = -323586.54 (J) H = -274897.48 (J) S = 44.14 (J/K) V = 8.08 (cc) Cp = 24.41 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 37.65 | 2.35 | 60.00 |

quartz mass = 14.39 (gm) density = 2.56 (gm/cc)
SiO2
G = -233844.92 (J) H = -201317.91 (J) S = 29.49 (J/K) V = 5.62 (cc) Cp = 16.82 (J/K)

rhm-oxide mass = 1.26 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.03Fe"0.67Mg0.18Fe"'0.08Al0.15Ti0.88O3
G = -13038.76 (J) H = -10452.08 (J) S = 2.34 (J/K) V = 0.28 (cc) Cp = 1.19 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.64 | 3.91 | 67.28 | 3.49 | 7.69 |

Total solids mass = 75.76 (gm) density = 2.92 (gm/cc)
G = -1150983.05 (J) H = -978229.11 (J) S = 156.60 (J/K) V = 25.94 (cc) Cp = 87.60 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1541448.09 (J) H = -1301307.65 (J) S = 217.69 (J/K) V = 35.92 (cc) Cp = 120.14 (J/K)

Oxygen delta moles = -0.00279658 delta grams = -0.0894873
G = 688.42 (J) H = -73.59 (J) S = -0.69 (J/K) V = -256.50 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 820.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.45 delta HM = -5.11 NNO = 0.00 QFM = -0.18 COH = 1.06 IW = 4.63

Constraint Flags: fO2 path = NNO

Liquid mass = 22.67 (gm) density = 2.42 (gm/cc) viscosity = 6.13 (log 10 poise) (analysis in wt %)
G = -366644.58 (J) H = -303825.12 (J) S = 57.47 (J/K) V = 9.38 (cc) Cp = 30.61 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.54 | 0.67 | 17.25 | 0.07 | 0.00 | 0.26 | 0.17 | 0.21 | 0.00 | 0.00 | 1.10 | 2.05 | 5.85 | 0.40 | 4.44 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.57 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.41)3Al2Si3O12
G = -355070.17 (J) H = -300440.64 (J) S = 49.97 (J/K) V = 6.58 (cc) Cp = 28.26 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.68 | 7.87 | 41.45 |

feldspar mass = 14.32 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.14Na0.72Ca0.15Al1.15Si2.85O8
G = -230515.60 (J) H = -196600.07 (J) S = 31.03 (J/K) V = 5.51 (cc) Cp = 17.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 71.66 | 14.68 | 13.65 |

feldspar mass = 21.22 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.61Na0.36Ca0.02Al1.02Si2.98O8
G = -332894.64 (J) H = -283447.79 (J) S = 45.23 (J/K) V = 8.33 (cc) Cp = 25.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 36.40 | 2.16 | 61.43 |

quartz mass = 14.83 (gm) density = 2.56 (gm/cc)
SiO2
G = -240725.38 (J) H = -207675.58 (J) S = 30.23 (J/K) V = 5.79 (cc) Cp = 17.32 (J/K)

rhm-oxide mass = 1.29 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.67Mg0.18Fe'"0.07Al0.16Ti0.89O3
G = -13420.58 (J) H = -10793.87 (J) S = 2.40 (J/K) V = 0.29 (cc) Cp = 1.22 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.71 | 3.69 | 67.27 | 3.55 | 7.78 |

Total solids mass = 77.24 (gm) density = 2.91 (gm/cc)
G = -1172626.37 (J) H = -998957.95 (J) S = 158.87 (J/K) V = 26.50 (cc) Cp = 89.27 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.78 (gm/cc)
G = -1539270.95 (J) H = -1302783.07 (J) S = 216.34 (J/K) V = 35.89 (cc) Cp = 119.88 (J/K)

Oxygen delta moles = -0.00280995 delta grams = -0.0899149
G = 684.78 (J) H = -72.96 (J) S = -0.69 (J/K) V = -255.39 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 810.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.66 delta HM = -5.12 NNO = 0.00 QFM = -0.19 COH = 1.02 IW = 4.65

Constraint Flags: fO2 path = NNO

Liquid mass = 21.28 (gm) density = 2.41 (gm/cc) viscosity = 6.04 (log 10 poise) (analysis in wt %)
G = -344288.83 (J) H = -285712.69 (J) S = 54.08 (J/K) V = 8.82 (cc) Cp = 28.80 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 67.17 | 0.63 | 17.47 | 0.06 | 0.00 | 0.23 | 0.17 | 0.19 | 0.00 | 0.00 | 1.10 | 2.05 | 5.76 | 0.43 | 4.73 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.58 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.41)3Al2Si3O12
G = -354746.74 (J) H = -300872.89 (J) S = 49.74 (J/K) V = 6.58 (cc) Cp = 28.24 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.67 | 7.85 | 41.48 |

feldspar mass = 14.67 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.13Na0.72Ca0.15Al1.15Si2.85O8
G = -235903.15 (J) H = -201657.09 (J) S = 31.62 (J/K) V = 5.64 (cc) Cp = 17.77 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.09 | 15.00 | 12.91 |

feldspar mass = 21.79 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.63Na0.35Ca0.02Al1.02Si2.98O8
G = -341162.73 (J) H = -291146.90 (J) S = 46.18 (J/K) V = 8.56 (cc) Cp = 25.80 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 35.21 | 2.00 | 62.79 |

quartz mass = 15.26 (gm) density = 2.56 (gm/cc)
SiO2
G = -247241.99 (J) H = -213743.05 (J) S = 30.93 (J/K) V = 5.96 (cc) Cp = 17.79 (J/K)

rhm-oxide mass = 1.33 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.67Mg0.18Fe'"0.07Al0.16Ti0.89O3
G = -13764.28 (J) H = -11106.77 (J) S = 2.45 (J/K) V = 0.29 (cc) Cp = 1.25 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.78 | 3.48 | 67.25 | 3.61 | 7.87 |

Total solids mass = 78.63 (gm) density = 2.91 (gm/cc)
G = -1192818.89 (J) H = -1018526.70 (J) S = 160.91 (J/K) V = 27.03 (cc) Cp = 90.85 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1537107.71 (J) H = -1304239.39 (J) S = 214.99 (J/K) V = 35.85 (cc) Cp = 119.64 (J/K)

Oxygen delta moles = -0.00282251 delta grams = -0.0903169
G = 680.88 (J) H = -72.29 (J) S = -0.70 (J/K) V = -254.18 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 800.00 (C) P = 8.000 (kbars) log(10) f O2 = -13.87 delta HM = -5.13 NNO = 0.00 QFM = -0.20 COH = 0.99 IW = 4.66

Constraint Flags: fO2 path = NNO

Liquid mass = 19.98 (gm) density = 2.41 (gm/cc) viscosity = 5.95 (log 10 poise) (analysis in wt %)
G = -323216.24 (J) H = -268596.73 (J) S = 50.90 (J/K) V = 8.29 (cc) Cp = 27.09 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.75 | 0.59 | 17.71 | 0.06 | 0.00 | 0.21 | 0.18 | 0.18 | 0.00 | 0.00 | 1.11 | 2.04 | 5.67 | 0.45 | 5.04 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.59 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.42)3Al2Si3O12
G = -354336.84 (J) H = -301228.83 (J) S = 49.49 (J/K) V = 6.58 (cc) Cp = 28.21 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.67 | 7.82 | 41.51 |

feldspar mass = 15.02 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.72Ca0.15Al1.15Si2.85O8
G = -241330.23 (J) H = -206767.99 (J) S = 32.21 (J/K) V = 5.77 (cc) Cp = 18.21 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.50 | 15.29 | 12.21 |

feldspar mass = 22.31 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.64Na0.34Ca0.02Al1.02Si2.98O8
G = -348554.58 (J) H = -298128.81 (J) S = 46.99 (J/K) V = 8.76 (cc) Cp = 26.39 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 34.07 | 1.84 | 64.09 |

quartz mass = 15.66 (gm) density = 2.56 (gm/cc)
SiO2
G = -253445.99 (J) H = -219562.66 (J) S = 31.57 (J/K) V = 6.12 (cc) Cp = 18.24 (J/K)

rhm-oxide mass = 1.36 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.67Mg0.18Fe'"0.07Al0.16Ti0.89O3
G = -14074.41 (J) H = -11394.15 (J) S = 2.50 (J/K) V = 0.30 (cc) Cp = 1.28 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.84 | 3.28 | 67.23 | 3.67 | 7.98 |

Total solids mass = 79.93 (gm) density = 2.90 (gm/cc)
G = -1211742.04 (J) H = -1037082.43 (J) S = 162.75 (J/K) V = 27.53 (cc) Cp = 92.33 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1534958.28 (J) H = -1305679.16 (J) S = 213.65 (J/K) V = 35.82 (cc) Cp = 119.42 (J/K)

Oxygen delta moles = -0.00283436 delta grams = -0.0906962
G = 676.76 (J) H = -71.60 (J) S = -0.70 (J/K) V = -252.90 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 790.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.09 delta HM = -5.14 NNO = 0.00 QFM = -0.22 COH = 0.95 IW = 4.68

Constraint Flags: fO2 path = NNO

Liquid mass = 18.74 (gm) density = 2.40 (gm/cc) viscosity = 5.84 (log 10 poise) (analysis in wt %)
G = -303264.90 (J) H = -252347.89 (J) S = 47.89 (J/K) V = 7.79 (cc) Cp = 25.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 66.29 | 0.55 | 17.98 | 0.05 | 0.00 | 0.19 | 0.19 | 0.17 | 0.00 | 0.00 | 1.12 | 2.04 | 5.57 | 0.48 | 5.37 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.59 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.42)3Al2Si3O12
G = -353850.48 (J) H = -301516.48 (J) S = 49.23 (J/K) V = 6.58 (cc) Cp = 28.18 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 50.67 | 7.78 | 41.55 |

feldspar mass = 15.37 (gm) density = 2.60 (gm/cc) (analysis in mole %)
K0.12Na0.73Ca0.16Al1.16Si2.84O8
G = -246766.37 (J) H = -211906.94 (J) S = 32.79 (J/K) V = 5.90 (cc) Cp = 18.67 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 72.87 | 15.56 | 11.56 |

feldspar mass = 22.78 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.65Na0.33Ca0.02Al1.02Si2.98O8
G = -355201.92 (J) H = -304501.27 (J) S = 47.69 (J/K) V = 8.95 (cc) Cp = 26.94 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 32.96 | 1.70 | 65.34 |

quartz mass = 16.04 (gm) density = 2.56 (gm/cc)
SiO2
G = -259383.94 (J) H = -225173.09 (J) S = 32.18 (J/K) V = 6.27 (cc) Cp = 18.67 (J/K)

rhm-oxide mass = 1.39 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.67Mg0.18Fe'"0.06Al0.16Ti0.89O3
G = -14354.99 (J) H = -11659.04 (J) S = 2.54 (J/K) V = 0.31 (cc) Cp = 1.31 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.89 | 3.10 | 67.20 | 3.72 | 8.09 |

Total solids mass = 81.17 (gm) density = 2.90 (gm/cc)
G = -1229557.70 (J) H = -1054756.82 (J) S = 164.42 (J/K) V = 28.00 (cc) Cp = 93.75 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1532822.60 (J) H = -1307104.71 (J) S = 212.31 (J/K) V = 35.79 (cc) Cp = 119.23 (J/K)

Oxygen delta moles = -0.00284558 delta grams = -0.0910552
G = 672.44 (J) H = -70.88 (J) S = -0.70 (J/K) V = -251.53 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 780.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.31 delta HM = -5.15 NNO = 0.00 QFM = -0.23 COH = 0.92 IW = 4.70

Constraint Flags: fO2 path = NNO

Liquid mass = 17.55 (gm) density = 2.40 (gm/cc) viscosity = 5.76 (log 10 poise) (analysis in wt %)
G = -284103.75 (J) H = -236767.00 (J) S = 44.95 (J/K) V = 7.30 (cc) Cp = 23.92 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.72 | 0.52 | 18.42 | 0.04 | 0.00 | 0.17 | 0.19 | 0.15 | 0.00 | 0.00 | 1.13 | 1.99 | 5.47 | 0.52 | 5.68 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.34 (gm) density = 3.89 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.51Mg0.41)3Al2Si3O12
G = -349274.01 (J) H = -298242.51 (J) S = 48.46 (J/K) V = 6.51 (cc) Cp = 27.84 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.20 | 7.70 | 41.10 |

biotite mass = 0.23 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -3664.19 (J) H = -3137.50 (J) S = 0.50 (J/K) V = 0.08 (cc) Cp = 0.29 (J/K)

| annite | phlogopite |
|---|---|
| 0.77 | 99.23 |

feldspar mass = 16.01 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.11Na0.73Ca0.16Al1.16Si2.84O8
G = -256675.25 (J) H = -220918.34 (J) S = 33.95 (J/K) V = 6.14 (cc) Cp = 19.48 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.17 | 15.91 | 10.91 |

feldspar mass = 22.90 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.67Na0.32Ca0.02Al1.02Si2.98O8
G = -356377.33 (J) H = -306198.97 (J) S = 47.65 (J/K) V = 8.99 (cc) Cp = 27.07 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 31.80 | 1.58 | 66.62 |

quartz mass = 16.47 (gm) density = 2.56 (gm/cc)
SiO2
G = -265998.15 (J) H = -231392.54 (J) S = 32.86 (J/K) V = 6.43 (cc) Cp = 19.15 (J/K)

rhm-oxide mass = 1.41 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.67Mg0.18Fe'"0.06Al0.17Ti0.89O3
G = -14608.11 (J) H = -11900.88 (J) S = 2.57 (J/K) V = 0.31 (cc) Cp = 1.33 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.55 | 2.92 | 67.43 | 3.75 | 8.36 |

Total solids mass = 82.36 (gm) density = 2.89 (gm/cc)
G = -1246597.03 (J) H = -1071790.74 (J) S = 165.98 (J/K) V = 28.47 (cc) Cp = 95.16 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1530700.77 (J) H = -1308557.74 (J) S = 210.93 (J/K) V = 35.77 (cc) Cp = 119.08 (J/K)

Oxygen delta moles = -0.00285624 delta grams = -0.0913962
G = 667.95 (J) H = -70.14 (J) S = -0.70 (J/K) V = -250.10 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 770.00 (C) P = 8.000 (kbars) log(10) f O2 = -14.54 delta HM = -5.16 NNO = 0.00 QFM = -0.24 COH = 0.88
IW = 4.71

Constraint Flags: fO2 path = NNO

Liquid mass = 16.44 (gm) density = 2.40 (gm/cc) viscosity = 5.68 (log 10 poise) (analysis in wt %)
G = -266294.11 (J) H = -222273.81 (J) S = 42.20 (J/K) V = 6.85 (cc) Cp = 22.48 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 65.08 | 0.49 | 18.92 | 0.04 | 0.00 | 0.15 | 0.20 | 0.14 | 0.00 | 0.00 | 1.14 | 1.92 | 5.37 | 0.55 | 5.99 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 25.04 (gm) density = 3.90 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.52Mg0.41)3Al2Si3O12
G = -343923.80 (J) H = -294276.77 (J) S = 47.59 (J/K) V = 6.42 (cc) Cp = 27.45 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 51.84 | 7.61 | 40.55 |

biotite mass = 0.50 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -7955.45 (J) H = -6827.54 (J) S = 1.08 (J/K) V = 0.18 (cc) Cp = 0.63 (J/K)

| annite | phlogopite |
|---|---|
| 0.77 | 99.23 |

feldspar mass = 16.66 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.10Na0.73Ca0.16Al1.16Si2.84O8
G = -266863.99 (J) H = -230209.70 (J) S = 35.14 (J/K) V = 6.39 (cc) Cp = 20.33 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.43 | 16.27 | 10.30 |

feldspar mass = 22.95 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.68Na0.31Ca0.01Al1.01Si2.99O8
G = -356310.12 (J) H = -306831.42 (J) S = 47.43 (J/K) V = 9.01 (cc) Cp = 27.12 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 30.67 | 1.46 | 67.87 |

quartz mass = 16.89 (gm) density = 2.56 (gm/cc)
SiO2
G = -272406.19 (J) H = -237455.38 (J) S = 33.51 (J/K) V = 6.60 (cc) Cp = 19.61 (J/K)

rhm-oxide mass = 1.44 (gm) density = 4.53 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.68Mg0.17Fe"'0.05Al0.17Ti0.89O3
G = -14839.38 (J) H = -12125.92 (J) S = 2.60 (J/K) V = 0.32 (cc) Cp = 1.35 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 17.12 | 2.74 | 67.69 | 3.78 | 8.68 |

Total solids mass = 83.47 (gm) density = 2.89 (gm/cc)
G = -1262298.92 (J) H = -1087726.73 (J) S = 167.35 (J/K) V = 28.91 (cc) Cp = 96.49 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.79 (gm/cc)
G = -1528593.03 (J) H = -1310000.54 (J) S = 209.55 (J/K) V = 35.76 (cc) Cp = 118.97 (J/K)

Oxygen delta moles = -0.00286646 delta grams = -0.0917232
G = 663.31 (J) H = -69.39 (J) S = -0.70 (J/K) V = -248.61 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 760.00 (C)  P = 8.000 (kbars)  log(10) f O2 = -14.77  delta HM = -5.17  NNO = 0.00  QFM = -0.25  COH = 0.84
IW = 4.73

Constraint Flags: fO2 path = NNO

Liquid  mass = 15.43 (gm)  density = 2.40 (gm/cc)  viscosity = 5.59 (log 10 poise)  (analysis in wt %)
G = -250065.64 (J)  H = -209051.14 (J)  S = 39.70 (J/K)  V = 6.43 (cc)  Cp = 21.17 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 64.42 | 0.46 | 19.43 | 0.04 | 0.00 | 0.13 | 0.21 | 0.12 | 0.00 | 0.00 | 1.15 | 1.86 | 5.26 | 0.59 | 6.32 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet  mass = 24.77 (gm)  density = 3.91 (gm/cc)  (analysis in mole %)
(Ca0.08Fe"0.52Mg0.40)3Al2Si3O12
G = -339073.51 (J)  H = -290727.79 (J)  S = 46.79 (J/K)  V = 6.34 (cc)  Cp = 27.09 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 52.43 | 7.51 | 40.06 |

biotite  mass = 0.74 (gm)  density = 2.76 (gm/cc)  (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -11730.17 (J)  H = -10090.10 (J)  S = 1.59 (J/K)  V = 0.27 (cc)  Cp = 0.93 (J/K)

| annite | phlogopite |
|---|---|
| 0.75 | 99.25 |

feldspar  mass = 17.25 (gm)  density = 2.61 (gm/cc)  (analysis in mole %)
K0.10Na0.74Ca0.17Al1.17Si2.83O8
G = -276034.82 (J)  H = -238659.89 (J)  S = 36.18 (J/K)  V = 6.61 (cc)  Cp = 21.14 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.68 | 16.59 | 9.73 |

feldspar  mass = 23.00 (gm)  density = 2.55 (gm/cc)  (analysis in mole %)
K0.69Na0.30Ca0.01Al1.01Si2.99O8
G = -356412.64 (J)  H = -307610.02 (J)  S = 47.24 (J/K)  V = 9.03 (cc)  Cp = 27.19 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 29.59 | 1.35 | 69.06 |

quartz  mass = 17.27 (gm)  density = 2.60 (gm/cc)
SiO2
G = -278133.03 (J)  H = -243397.05 (J)  S = 33.62 (J/K)  V = 6.64 (cc)  Cp = 23.27 (J/K)

rhm-oxide  mass = 1.46 (gm)  density = 4.53 (gm/cc)  (analysis in mole %)
Mn0.04Fe"0.68Mg0.17Fe'"0.05Al0.18Ti0.88O3
G = -15047.70 (J)  H = -12333.64 (J)  S = 2.63 (J/K)  V = 0.32 (cc)  Cp = 1.37 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 16.73 | 2.57 | 67.89 | 3.80 | 9.01 |

Total solids  mass = 84.47 (gm)  density = 2.89 (gm/cc)
G = -1276431.87 (J)  H = -1102818.50 (J)  S = 168.04 (J/K)  V = 29.21 (cc)  Cp = 100.99 (J/K)

Viscosity of the System cannot be computed.

System  mass = 99.91 (gm)  density = 2.80 (gm/cc)
G = -1526497.52 (J)  H = -1311869.64 (J)  S = 207.74 (J/K)  V = 35.64 (cc)  Cp = 122.16 (J/K)

Oxygen delta moles = -0.00287629 delta grams = -0.0920378
G = 658.54 (J) H = -68.62 (J) S = -0.70 (J/K) V = -247.07 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 750.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.01 delta HM = -5.18 NNO = 0.00 QFM = -0.27 COH = 0.80 IW = 4.75

Constraint Flags: fO2 path = NNO

Liquid mass = 14.31 (gm) density = 2.40 (gm/cc) viscosity = 5.46 (log 10 poise) (analysis in wt %)
G = -232090.08 (J) H = -194258.94 (J) S = 36.98 (J/K) V = 5.97 (cc) Cp = 19.71 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.60 | 0.42 | 19.98 | 0.03 | 0.00 | 0.12 | 0.23 | 0.11 | 0.00 | 0.00 | 1.18 | 1.84 | 5.13 | 0.63 | 6.72 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 24.46 (gm) density = 3.91 (gm/cc) (analysis in mole %)
(Ca0.07Fe"0.53Mg0.39)3Al2Si3O12
G = -333482.00 (J) H = -286513.25 (J) S = 45.91 (J/K) V = 6.25 (cc) Cp = 26.68 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 53.13 | 7.44 | 39.43 |

biotite mass = 1.02 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -16260.62 (J) H = -14018.93 (J) S = 2.19 (J/K) V = 0.37 (cc) Cp = 1.29 (J/K)

| annite | phlogopite |
|---|---|
| 0.75 | 99.25 |

feldspar mass = 17.76 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.74Ca0.17Al1.17Si2.83O8
G = -284038.63 (J) H = -246134.10 (J) S = 37.05 (J/K) V = 6.80 (cc) Cp = 21.91 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 73.91 | 16.89 | 9.20 |

feldspar mass = 23.08 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.70Na0.29Ca0.01Al1.01Si2.99O8
G = -356978.08 (J) H = -308789.39 (J) S = 47.10 (J/K) V = 9.06 (cc) Cp = 27.32 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.55 | 1.25 | 70.19 |

quartz mass = 17.73 (gm) density = 2.60 (gm/cc)
SiO2
G = -285170.22 (J) H = -250094.19 (J) S = 34.28 (J/K) V = 6.81 (cc) Cp = 23.68 (J/K)

sillimanite mass = 0.07 (gm) density = 3.24 (gm/cc)
Al2SiO5
G = -1132.51 (J) H = -1005.45 (J) S = 0.12 (J/K) V = 0.02 (cc) Cp = 0.08 (J/K)

rhm-oxide mass = 1.48 (gm) density = 4.54 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.68Mg0.16Fe'"0.05Al0.19Ti0.88O3
G = -15270.76 (J) H = -12553.78 (J) S = 2.66 (J/K) V = 0.33 (cc) Cp = 1.39 (J/K)

geikielite hematite ilmenite pyrophanite corundum
16.26 2.42 68.15 3.81 9.35

Total solids mass = 85.59 (gm) density = 2.89 (gm/cc)
G = -1292332.82 (J) H = -1119109.09 (J) S = 169.30 (J/K) V = 29.63 (cc) Cp = 102.34 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.81 (gm/cc)
G = -1524422.89 (J) H = -1313368.03 (J) S = 206.28 (J/K) V = 35.61 (cc) Cp = 122.06 (J/K)

Oxygen delta moles = -0.00288463 delta grams = -0.0923048
G = 653.40 (J) H = -67.81 (J) S = -0.70 (J/K) V = -245.39 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 740.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.25 delta HM = -5.19 NNO = 0.00 QFM = -0.28 COH = 0.76 IW = 4.77

Constraint Flags: fO2 path = NNO

Liquid mass = 9.78 (gm) density = 2.38 (gm/cc) viscosity = 4.91 (log 10 poise) (analysis in wt %)
G = -158728.52 (J) H = -132626.74 (J) S = 25.76 (J/K) V = 4.11 (cc) Cp = 13.59 (J/K)

| SiO2 | TiO2 | Al2O3 | Fe2O3 | Cr2O3 | FeO | MnO | MgO | NiO | CoO | CaO | Na2O | K2O | P2O5 | H2O | CO2 | SO3 | Cl2O-1 | F2O-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62.37 | 0.33 | 19.55 | 0.04 | 0.00 | 0.13 | 0.30 | 0.10 | 0.00 | 0.00 | 1.53 | 2.18 | 4.79 | 0.93 | 7.76 | 0.00 | 0.00 | 0.00 | 0.00 |

garnet mass = 23.36 (gm) density = 3.93 (gm/cc) (analysis in mole %)
(Ca0.08Fe"0.56Mg0.36)3Al2Si3O12
G = -315166.60 (J) H = -271135.10 (J) S = 43.46 (J/K) V = 5.94 (cc) Cp = 25.31 (J/K)

| almandine | grossular | pyrope |
|---|---|---|
| 55.63 | 7.94 | 36.43 |

biotite mass = 2.15 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -34207.31 (J) H = -29555.12 (J) S = 4.59 (J/K) V = 0.78 (cc) Cp = 2.71 (J/K)

| annite | phlogopite |
|---|---|
| 0.97 | 99.03 |

muscovite mass = 3.43 (gm) density = 2.80 (gm/cc)
KAl2Si3AlO10(OH)2
G = -54918.71 (J) H = -47763.94 (J) S = 7.06 (J/K) V = 1.23 (cc) Cp = 4.43 (J/K)

feldspar mass = 19.14 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.75Ca0.16Al1.16Si2.84O8
G = -305664.72 (J) H = -265444.79 (J) S = 39.70 (J/K) V = 7.33 (cc) Cp = 23.83 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 74.80 | 16.21 | 8.99 |

feldspar mass = 20.60 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -318100.77 (J) H = -275769.40 (J) S = 41.78 (J/K) V = 8.08 (cc) Cp = 24.44 (J/K)

albite anorthite sanidine
28.19 1.14 70.67

quartz mass = 19.91 (gm) density = 2.61 (gm/cc)
SiO2
G = -319912.75 (J) H = -281164.76 (J) S = 38.25 (J/K) V = 7.63 (cc) Cp = 26.37 (J/K)

rhm-oxide mass = 1.54 (gm) density = 4.55 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.70Mg0.15Fe'"0.05Al0.18Ti0.89O3
G = -15675.29 (J) H = -12901.76 (J) S = 2.74 (J/K) V = 0.34 (cc) Cp = 1.43 (J/K)
geikielite hematite ilmenite pyrophanite corundum
14.75 2.52 69.87 4.04 8.82

Total solids mass = 90.13 (gm) density = 2.88 (gm/cc)
G = -1363646.14 (J) H = -1183734.88 (J) S = 177.58 (J/K) V = 31.33 (cc) Cp = 108.53 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.82 (gm/cc)
G = -1522374.65 (J) H = -1316361.63 (J) S = 203.34 (J/K) V = 35.44 (cc) Cp = 122.12 (J/K)

Oxygen delta moles = -0.00287844 delta grams = -0.0921065
G = 644.97 (J) H = -66.66 (J) S = -0.70 (J/K) V = -242.47 (cc) Cp = -0.10 (J/K)

**********----------**********
Title: metapelite

T = 730.00 (C) P = 8.000 (kbars) log(10) f O2 = -15.49 delta HM = -5.20 NNO = 0.00 QFM = -0.29 COH = 0.72 IW = 4.79

Constraint Flags: fO2 path = NNO

Liquid mass = 5.33 (gm) density = 2.34 (gm/cc) viscosity = 3.81 (log 10 poise) (analysis in wt %)
G = -86719.84 (J) H = -71998.67 (J) S = 14.67 (J/K) V = 2.28 (cc) Cp = 7.56 (J/K)
SiO2 TiO2 Al2O3 Fe2O3 Cr2O3 FeO MnO MgO NiO CoO CaO Na2O K2O P2O5 H2O CO2 SO3 Cl2O-1 F2O-1
59.68 0.22 18.20 0.05 0.00 0.18 0.50 0.09 0.00 0.00 2.40 3.04 4.10 1.64 9.91 0.00 0.00 0.00 0.00

garnet mass = 22.06 (gm) density = 3.96 (gm/cc) (analysis in mole %)
(Ca0.09Fe"0.59Mg0.32)3Al2Si3O12
G = -293649.50 (J) H = -252890.74 (J) S = 40.63 (J/K) V = 5.58 (cc) Cp = 23.70 (J/K)
almandine grossular pyrope
58.92 8.93 32.15

biotite mass = 3.57 (gm) density = 2.76 (gm/cc) (analysis in mole %)
K(Fe"0.01Mg0.99)3AlSi3O10(OH)2
G = -56519.77 (J) H = -48932.19 (J) S = 7.56 (J/K) V = 1.29 (cc) Cp = 4.49 (J/K)
annite phlogopite
1.44 98.56

muscovite mass = 7.17 (gm) density = 2.80 (gm/cc)
KAl2Si3AlO10(OH)2
G = -114631.30 (J) H = -99917.76 (J) S = 14.67 (J/K) V = 2.56 (cc) Cp = 9.25 (J/K)

feldspar mass = 20.49 (gm) density = 2.61 (gm/cc) (analysis in mole %)
K0.09Na0.76Ca0.15Al1.15Si2.85O8
G = -326725.45 (J) H = -284331.06 (J) S = 42.26 (J/K) V = 7.85 (cc) Cp = 25.84 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 76.08 | 14.96 | 8.95 |

feldspar mass = 17.51 (gm) density = 2.55 (gm/cc) (analysis in mole %)
K0.71Na0.28Ca0.01Al1.01Si2.99O8
G = -270036.31 (J) H = -234615.44 (J) S = 35.31 (J/K) V = 6.87 (cc) Cp = 20.86 (J/K)

| albite | anorthite | sanidine |
|---|---|---|
| 28.20 | 1.01 | 70.79 |

quartz mass = 22.19 (gm) density = 2.61 (gm/cc)
SiO2
G = -356158.11 (J) H = -313686.19 (J) S = 42.34 (J/K) V = 8.50 (cc) Cp = 29.15 (J/K)

rhm-oxide mass = 1.58 (gm) density = 4.58 (gm/cc) (analysis in mole %)
Mn0.04Fe"0.72Mg0.13Fe'"0.06Al0.15Ti0.90O3
G = -15815.01 (J) H = -13020.32 (J) S = 2.79 (J/K) V = 0.34 (cc) Cp = 1.46 (J/K)

| geikielite | hematite | ilmenite | pyrophanite | corundum |
|---|---|---|---|---|
| 12.83 | 2.79 | 72.32 | 4.35 | 7.71 |

apatite mass = 0.01 (gm) density = 3.06 (gm/cc)
Ca5(PO4)3OH
G = -109.72 (J) H = -94.68 (J) S = 0.01 (J/K) V = 0.00 (cc) Cp = 0.01 (J/K)

Total solids mass = 94.58 (gm) density = 2.87 (gm/cc)
G = -1433645.17 (J) H = -1247488.38 (J) S = 185.57 (J/K) V = 32.99 (cc) Cp = 114.76 (J/K)

Viscosity of the System cannot be computed.

System mass = 99.91 (gm) density = 2.83 (gm/cc)
G = -1520365.01 (J) H = -1319487.05 (J) S = 200.25 (J/K) V = 35.27 (cc) Cp = 122.32 (J/K)

Oxygen delta moles = -0.00286404 delta grams = -0.0916458
G = 634.76 (J) H = -65.33 (J) S = -0.70 (J/K) V = -238.87 (cc) Cp = -0.10 (J/K)