

Ternary Eutectic Phase Diagram

Equilibrium crystallization of Y

▶ Melt path

▶ Solid path

Temperature 1

Melt% = $2.8/4.62 \times 100 = 61\%$
 Solid% = $1.875/4.62 \times 100 = 39\%$
 Solid Composition = Ab
 Melt Composition = $17\%SiO_2 + 33\%NaAlSi_3O_8 + 50\%KAlSi_3O_8$

Temperature 2 (arrival at eutectic)

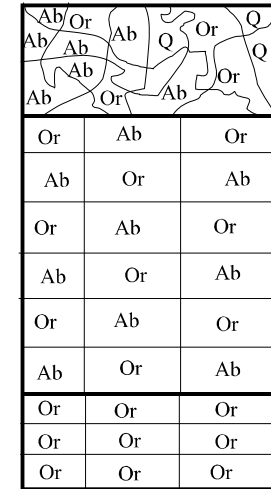
Melt% = $0.875/3.81 \times 100 = 23\%$
 Solid% = $2.94/3.81 \times 100 = 77\%$
 Solid Composition = $72\%Ab + 28\%Or$
 Melt Composition = $45\%SiO_2 + 20\%NaAlSi_3O_8 + 35\%KAlSi_3O_8$

Temperature 3 (below eutectic)

100% Solid
 Q: 10%
 Ab: 60%
 Or: 30%
 (original composition read from ternary grid lines)

Fractional crystallization of Z

45%Q +
20%Ab +
35%Or



29%

59%Or +
41%Ab

51%

20%

Measurements

Temperature 1
 $0.6875/3.5 \times 100 = 20\%$ Solid

Temperature 2
 $1.938/3.5 \times 100 = 64\%$ Solid
 Total system (Ab+Or) = $0.64 \times 80\% = 51\%$
 Total system melt = $0.36 \times 80\% = 29\%$

