



Experimental study of the Silica-deficient portion of the system Nepheline-Kalsilite-SiO₂ at 2 GPa, and variable temperatures.

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Phase relations in the silica-deficient part of the Nepheline (Ne)-Kalsilite (Ks) -SiO₂ (Q) system have been studied under 2 GPa [P(H₂O) = P(Total)] at variable temperatures. The study shows that the Albite (Ab)-K-feldspar (Kf) - Kalsilite (Ks) - Nepheline (Ne) quadrilateral, may be subdivided into two subsystems namely, Ab -Kf -Ne and 2) Kf - Ks - Ne. Each subsystem is characterized by a eutectic. They occur at 1) Ne₄₈Ks₂₁Q₃₁ and 620 ± 10°C (Ne_{ss} + Na-K-feldspar + K-Na-feldspar + liquid; nepheline syenite) and at 2) Ne₂₂Ks₄₉Q₂₉ and 635 ± 10°C (K-rich K-feldspar + Ks_{ss} + Ne_{ss} + liquid; Ne-Ks syenite). In the bounding join Ab-Kf, Na-K-feldspar, K-Na-feldspar and liquid are in equilibrium at the eutectic, Ab₇₁Kf₂₉ (660 ± 10°C). In the Ne-Ks system, the eutectic occurs at Ne₅₄Ks₄₆ and 800 ± 10°C. Whereas the eutectic for Ne-Ab join has been established at Ab₆₅Ne₃₅ and 875 ± 10°C (Ab_{ss} + Ne_{ss} + liquid), that for the Ks-Kf join occurs at Kf₇₈Ks₂₂ and 775 ± 10°C, where Kf_{ss} and Ks_{ss} co-exist with liquid in equilibrium. The Ne-Kf thermal barrier cuts the feldspar-feldspathoid phase boundary at Ne₃₃Ks_{37.5}Q_{29.5}.