

The Phase Diagram $\text{TiO}_2\text{-CaF}_2$

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The phase diagram for the system $\text{TiO}_2\text{-CaF}_2$ has been constructed by the heat treatment, at various temperatures in an atmosphere of pure dry argon, of powder mixtures of compositions ranging from 100% TiO_2 to 100% CaF_2 , and by subsequent cooling of the samples in different ways, principally quenching in CCl_4 . The experiments were performed in a specially constructed apparatus. The same apparatus and method has been used

(m.p. of $\text{CaF}_2 = 1418^\circ$)² and TiO_2 at 1200° (m.p. of $\text{TiO}_2 = 1840^\circ$)³ in order to prevent fluorine losses in the form of HF by reaction of CaF_2 with water vapor when heat treating the powder mixtures, and stored in a desiccator with $\text{Mg}(\text{ClO}_4)_2$ and then followed the grinding, weighing and mixing. The sample was placed in a small Pt envelope and suspended in the hot zone of a vertical Pt 40% Rh-wound furnace. The temperatures were measured by a Pt-Pt 10% Rh thermocouple and a "Leeds and Northrup Type K-3 Universal Potentiometer".

The system has a eutectic point at 1360° corresponding to a composition of 57% $\text{TiO}_2 + 43\%$ CaF_2 and a two-liquid area above a temperature of 1365° and between the compositions 55% $\text{TiO}_2 + 45\%$ CaF_2 , and 6% $\text{TiO}_2 + 94\%$ CaF_2 .

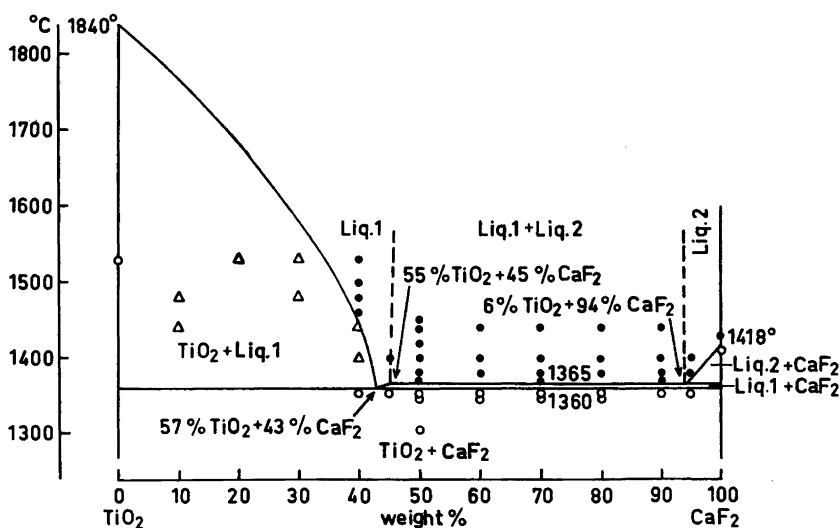


Fig. 1. The phase diagram $\text{TiO}_2\text{-CaF}_2$. ●, fully melted samples; △, partly melted samples; ○, not melted samples.

in a series of phase diagram studies one of which has been published.¹ The flow properties and microscopic appearance of polished sections of the products obtained were studied. X-Ray powder photographs obtained with the help of a Guinier camera were also examined. The raw materials used were of highest analytical purity. They were dried separately: CaF_2 at 800°

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