

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

LARS HILLERT

Department of Inorganic Chemistry, Chalmers  
University of Technology, Gothenburg,  
Sweden

The phase diagram for the system  $\text{SiO}_2\text{-CaF}_2$  has been constructed by the heat treatment, at various temperatures and oven atmospheres, of powder mixtures of compositions ranging from 100%  $\text{SiO}_2$  to 100%  $\text{CaF}_2$  and by subsequent cooling

help of a Guinier camera were also examined. The stable system has a eutectic point at  $1240^\circ$  corresponding to a composition of 47%  $\text{SiO}_2$  + 53%  $\text{CaF}_2$ , and a two-liquid area between  $1420^\circ$  and  $1290^\circ$  and the compositions 43%  $\text{SiO}_2$  + 57%  $\text{CaF}_2$  and 23%  $\text{SiO}_2$  + 77%  $\text{CaF}_2$ . In the meta-stable system the compounds  $\text{SiO}_2 \cdot 2\text{CaF}_2$  and  $\text{SiO}_2 \cdot \text{CaF}_2$  appear below  $1230^\circ$  and  $1210^\circ$ , respectively, together with a glass-phase whose composition lies between 50%  $\text{SiO}_2$  + 50%  $\text{CaF}_2$  and 47%  $\text{SiO}_2$  + 53%  $\text{CaF}_2$ . Other  $\text{CaF}_2$ -containing systems such as  $\text{TiO}_2\text{-CaF}_2$ ,  $\text{Al}_2\text{O}_3\text{-CaF}_2$ ,  $\text{SiO}_2\text{-TiO}_2\text{-CaF}_2$ ,  $\text{SiO}_2\text{-Al}_2\text{O}_3\text{-CaF}_2$ ,  $\text{TiO}_2\text{-Al}_2\text{O}_3\text{-CaF}_2$ ,

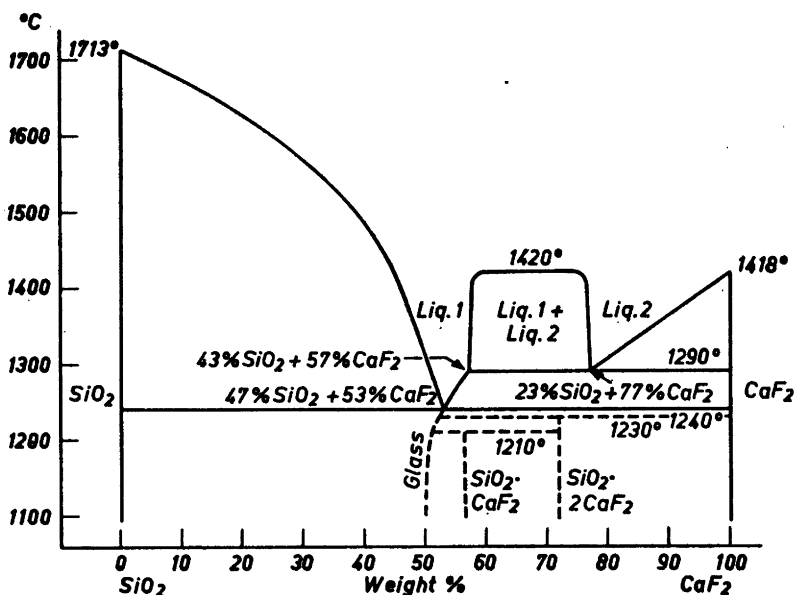


Fig. 1. Phase diagram  $\text{SiO}_2\text{-CaF}_2$ .

of the samples in different ways. The experiments were performed in a specially constructed apparatus, and the flow properties and microscopic appearance of the products obtained studied. X-Ray powder photographs obtained with the

$\text{TiO}_2\text{-CaO-CaF}_2$  and  $\text{SiO}_2\text{-CaO-CaF}_2$  are now being investigated. Within certain parts of these systems it is already possible to state the preliminary appearance of the phase diagrams.

Received November 20, 1964.