

CRYSTALLIZATION IN THE RE<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> SYSTEM

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The RE<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> system (RE = rare earths) is very useful as sintering additive for covalent ceramics as well as to prepare special glasses. At high temperatures most of the compositions in this system crystallize as silicates, RE<sub>2</sub>SiO<sub>5</sub> either RE<sub>2</sub>Si<sub>2</sub>O<sub>7</sub>. In the field of covalent ceramics such crystallization can be desired for improve the mechanical properties. On the other hand, for special glasses the crystallization should be avoided to assure their optical purity. Therefore, it is very important to know the system crystallization behavior, in a way that to be possible to control the processing, according to the desired application. In this work amorphous silica wafers were coated with RE<sub>2</sub>O<sub>3</sub> (RE = Y, La, Nd, Dy and Yb) alcoholic suspensions. A film was formed after solvent evaporation. These samples were annealed between 1200 and 1450 °C. The crystalline phases were identified and quantified by the Rietveld XRD method. The kinetics constants of the reaction



were calculated from the *concentration x time* curves and the activation energy evaluated from the Arrhenius plot.