

Synthesis and Characterization of $\text{Y}_2\text{O}_3/\text{SiO}_2$ Composites

C. Cannas, M. Casu, M. Mainas, A. Musinu, and G. Piccaluga

Dipartimento Scienze Chimiche, Cittadella Universitaria,
S.S 554 Km 4.5, 09042, Monserrato (CA), Italy

Reprint requests to A. M.; E-mail: musinu@vaxca1.unica.it

Z. Naturforsch. **59a**, 281 – 287 (2004); received June 3, 2003

Impregnation and deposition-precipitation syntheses have been used to obtain $\text{Y}_2\text{O}_3/\text{SiO}_2$ samples. In the deposition method, the urea causes the precipitation of yttrium hydroxide, which leads to the formation of yttria nanocrystalline particles in the final composites. Delaying the silica addition up to the visible muddying of the solution, a relevant formation of yttria nanocrystalline particles with average size of about 12 nm is produced. The composites obtained through the impregnation method are amorphous and contain different amounts of yttrium depending on the kind of solvent, the highest concentration being reached using ethanol. In all the samples important interactions at the molecular level among yttrium and silica are revealed, but less important in composites obtained with the deposition precipitation method.

Key words: Deposition; Infiltration; Nanocomposite.