E 48 STUDIES ON SOME CLATHRATE COMPOUNDS OF SILICA

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Clathrate compounds with silica framework are named as clathrasils[1] and they represent a new class of porous tectosilicates distinct from zeolites.

Five different types of clathrasils possessing topologicaly different frameworks have been crystallised from aqueous silica solutions in the presence of organic guest molecules. Synthetic experiments have been carried out under hydrothermal conditions at 150°C - 240°C in air as well as in the absence of atmospheric gases. All five clathrasil frameworks were found to be stable up to 900°C. In the temperature range 500 - 900°C, guest species are decomposed, oxidised and removed from the host lattice without structural

damage to the framework. At temperatures higher than 1000°C they are gradually transformed into cristobalite.

Experimental data indicate that the nature of the guest molecules play an important role in the formation of different frameworks which are stable up to 900°C, even after the removal of the guest species.

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Reference

1. Gies, H., Liebau, F. and Gerke, H. (1982) "Dodecasil" - a new clathrate compound of silica Angew. Chem. 94 214.