

HIGH-TEMPERATURE CRYSTALLIZATION OF SILICATE DUST

J.R. Brucato¹, L. Colangeli¹, V. Mennella¹, P. Palumbo², A. Rotundi², E. Bussoletti²

¹*Osservatorio Astronomico di Capodimonte, Napoli Italy.*

²*Istituto Universitario Navale, Napoli Italy.*

Spectroscopic observations performed by ISO satellite of cometary and circumstellar dust have provided the evidence that crystalline silicates are among the major constituents of the dust grains. The presence in various astronomical environments of crystalline grains raises problems on the formation processes. Once formed if dust is amorphous thermal annealing can change the internal structure, supplying the energy to the atoms to overcome the energy barrier to reach more ordered configurations. In this work we present laboratory results on amorphous-crystalline transitions of olivine and pyroxene samples by thermal annealing at 1073 and 1273 K for various time lags. Monitoring of the process is performed by mid-infrared spectroscopy. The results show that the samples analysed in this work present high activation energy preventing crystallization at low temperature.