

Evaporation of silicate melt and the condensation in microgravity

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Because of our little knowledge about the evaporation and condensation process in the early solar nebular, the direct observation of evaporation of gases and the forthcoming nucleation process to form cosmic dusts has been started. CAI and other silicate melts were evaporated by CO₂ laser, followed by condensation. Experiments have been performed in gravity and in microgravity using an airplane for the comparison. TEM analysis showed that in gravity particles are irregular in shape, enriched in volatile elements such as Na and K, and amorphous. The particles in microgravity were mainly Al₂O₃, which can be analyzed by the electron diffraction study. These results could be explained by the difference of heat and mass transfer process between gravity and microgravity.