

Kinetics of diamond oxidation in O₂ and oxidation of presolar diamonds in the solar nebula

Toshiyuki Fujioka[1]

[1] Earth and Space Sci, Osaka Univ

Primitive meteorites contain presolar diamonds that have survived the formation of the solar system. I discuss the physico-chemical raw processes which might take place during oxidation of diamonds in the solar nebula. There are some parameters in oxidation of diamonds, for example, grain size, oxygen pressure, temperature, and time. In this work, oxidation experiment of three size fractions of artificial diamonds were carried out in O₂ gas in variable condition. Diamond reaction with oxygen occurs at surface of diamond and inner of grain. Reaction rate is decided by chemical reaction at surface of single crystal. Reaction rate equation of diamond oxidation with oxygen is obtained from experimental data. Using this equation, oxidation of presolar diamond in solar nebula is discussed.