

Condensation and accretion of corundum and corundum-hibonite grains in the solar nebula

Takahiro Nakamura[1]; # naoji sugiura[2]; Akiko Miyazaki[3]; Makoto Kimura[4]

[1] Earth and Planetary Sci., Univ. of Tokyo; [2] Earth and Planetary Sci., Univ. of Tokyo; [3] Earth and Planetary Sci., Univ. of Tokyo; [4] Faculty of Science, Ibaraki University

An aggregate of corundum and an aggregate of corundum with overgrowth of hibonite were found in Acfer 094 chondrite. In the following, the former is called corundum aggregate whereas the latter is called corundum-hibonite aggregate. The corundum aggregates are not easily formed in the nominal solar nebula because hibonite would be formed before corundum grains accrete. We examined conditions which corundum aggregates may be formed. Generally, if relative velocity between grains are large then aggregates are formed in a short time scale. However, if the relative velocity is too large then grains will bounce rather than accrete. Therefore, possible conditions are either the nebula temperature stays between the condensation temperature of corundum and condensation temperature of hibonite, or the nebula was chemically fractionated (Ca-poor). In contrast, formation of corundum-hibonite aggregates are more easy. Although exact time scale depends on the kinetics of hibonite formation, a nebula with turbulent motion can form corundum-hibonite aggregates.