

Presolar grains in meteorites

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It is believed that pristine meteorites, i.e., the petrologic type 3, are mechanical aggregates of solar disk solids and have experienced little metamorphism and alteration after the accretion. Presolar grains have been survived in pristine meteorites. The first identification of presolar grain is carbonaceous phases; diamond (Lewis et al., 1987), SiC (Bernatowicz et al., 1987), and graphite (Amari et al., 1990). These presolar grains were found in chemical residue of meteorites by chemical processing after decomposition of all silicate phases. Oxides (Hutcheon et al., 1994; Nittler et al., 1994) and silicon nitride (Nittler et al., 1995) have also identified from the chemical residue. The first identification of presolar silicates has been from nonhydrous interplanetary dust particles (IDPs) (Messenger et al., 2003). This indicates that presolar silicates existed in the outer solar nebula because such IDPs come from comets. In 2004, two reports for presolar silicates in meteorites (Nguyen and Zinner; Nagashima et al.) have been independently published. Messenger et al. (2003) and Nagashima et al. (2004) applied in-situ survey of samples, whereas Nguyen and Zinner (2004) applied a survey from size-separated particles of grinding meteorite. The abundance of presolar silicates is only 10-1000 ppm in meteorite, but the most abundant species among presolar grains ever found. In this talk I introduce recent results of presolar grain survey from carbonaceous, ordinary and enstatite chondrites of our Hokudai cosmochemistry group and discuss the abundances and the origin.