

Trace Elements in Three Antarctic Ordinary Chondrites and Two Carbonaceous Chondrites with Special Reference to the Metallic Inclusions in Dal el Gani-194 Carbonaceous Chondrite

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Abstract

Biological mass extinction has been frequently discussed in relation with extraterrestrial impacts; the most valuable evidence is an abnormally high concentration of Ir near or in the boundary geological unit that is believed to have been formed at the mass extinction. K-T boundary (65Ma) should represent one of them. We, however, do not have enough chemical data of the platinum group elements in the meteorites. Cosmic abundance of Pt is twice more than Ir; why not use Pt. Also, sedimentary rocks including oceanic one differ remarkably from the extraterrestrial materials. We tried to find some element(s) that could be useful as an indicator of the extraterrestrial impacts using the PIXE analysis.

The Antarctic ordinary chondrites are very poor in platinum group elements. Ir abundance was below quantitative analysis level. Also Allende carbonaceous chondrite seems to contain extremely low platinum elements. Pt in the Allende meteorite was again below the quantitative analysis level. Very tiny thirteen metallic iron inclusions were separated from the Dal el Gani 194 carbonaceous chondrite; eleven of them have been successfully analyzed. Remaining two metallic nuggets were lost while handling. Some metallic iron contains considerable amount of Pt, Rh, In; but the other metallic iron does not contain much and their platinum group element abundances may be below quantitative analysis level. In contrast, platinum group elements the the Dal el Gani-194 could not be analyzed because of extreme low abundance.

We tried to compare the analytical results of the extraterrestrial materials with the sedimentary rocks of the earth. Ni and Cr may be good indicators when they are used in combination with the other elements; this comparison should be cautiously used in the researched areas.