

A search for presolar chromium rich grains in primitive chondrites

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Isotopic anomalies of ^{54}Cr have been reported in bulk carbonaceous chondrites, especially least metamorphosed CI chondrites. A Cr rich carrier(s) that has (have) ^{54}Cr excess was (were) found by step dissolution of carbonaceous chondrites. Presolar grains are suggested to be potential carriers of the Cr isotopic anomalies. Actually, transmission electron microscopy (TEM) studies revealed the presence of Cr bearing-phases in Orgueil (CI): magnesiochromite, ureyite and chromium-oxide, in addition to chromite. Spinel grains were studied with Nano-SIMS and found to have oxygen and magnesium isotopic anomalies, and hence of presolar origin. But the isotopic studies of chromium-oxide grains have not yet been performed.

In this study, we report Cr isotopic compositions of chromium-oxide and spinel grains in Orgueil and Tagish Lake (both of which are CI chondrites). We measured Cr and Fe isotopic compositions of some Cr rich phases by the SIMS in image acquisition mode using a resistive anode encoder (RAE) to obtain isotopic images.