

Refractory Siderophile Elements Depleted in AOA Metal

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Oxygen isotopes of ¹⁶O-rich composition are observed in calcium-aluminum-rich inclusions (CAI) and amoeboid olivine aggregates (AOA). Opaque assemblages in CAI[1,2] show enrichment of refractory siderophile elements relative to the metals in CH[3,4] and CB[5,6] chondrites measured by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). In this study, refractory siderophile elements of AOA metal were measured in Acfer 094 carbonaceous chondrites.

The siderophile elements Cr, Mn, Fe, Co, Ni, Cu, Ga, Ge, Pd, W, Re, Os, Ir, Pt in AOA metals and chondrule metals from a polished thin section of Acfer 094 were measured by LA-ICP-MS at Tokyo University. The oxygen isotopes of forsterites in AOA were measured by SIMS at Hokkaido University.

The refractory siderophile elements were depleted in the AOA metal more than two orders of magnitude lower than the metal in chondrules. The complementarity of the refractory siderophile elements between CAI and AOA metal indicates the formation from the same district for both ¹⁶O-rich materials.

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