Nucleosynthetic Sr and Nd isotopic anomalies of bulk differentiated meteorites

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Nucleosynthetic isotope anomalies have been discovered in bulk meteorites for refractory heavy elements (e.g., Cr, Ru [1, 2]). Although nucleosynthetic isotopic anomalies of bulk chondrites have been extensively studied in the last decade (e.g., [3]), the high-precision isotopic data of trans-iron elements in differentiated meteorites are still limited. In this study, we report high precision Sr and Nd isotope data of bulk differentiated meteorites.

We investigated two eucrites (Béréba and Millbillillie), one aubrite (Norton County), and one angrite (D'Orbigny). Most of the samples showed Sr and Nd isotopic ratios indistinguishable from the terrestrial rocks. Béréba (eucrite) possessed the most deviated Sr and Nd isotopic compositions from the terrestrial rocks, which are similar to those of enstatite and ordinary chondrites [3]. In the μ^{84}Sr versus $\mu^{148,\ 150}$Nd diagrams, Béréba is plotted on the mixing line of the isotopic compositions for terrestrial rocks and presolar SiC [4]. These data imply that the parent bodies for enstatite chondrites, ordinary chondrites, and eucrites were formed within a homogeneous isotopic reservoir with respect to Sr and Nd in which the majority of building blocks of the Earth were not formed.

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