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Barium isotope cosmochemistry and geochemistry

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Abstract

While the isotopic variations of barium were reported for the first time forty years ago, the number of studies on barium isotopes significantly increased only after 2010. Barium isotope anomalies in meteorites have been successfully used to provide constraints about the origin of presolar SiC grains. In carbonaceous chondrites Ba isotope anomalies are indicative of the heterogeneity of the early solar system, possibly resulting from of a later injection of material after the cooling of solar system. Barium isotope fractionation in the same carbonaceous chondrites suggests that a strong magnetic field was present in the innermost part of the early solar system. Barium mass-dependent isotope fractionation has also been detected throughout Earth surface materials. While igneous rocks show limited Ba isotopic variations, relatively large isotopic variations are observed amongst and within soils, rivers, and biological materials. Indeed, plants seem to fractionate Ba isotopes during Ba uptake from soil solutions. Therefore, Ba isotope signatures

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