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Sn isotopes in chondrites and Earth: MIF and radiogenic ^{115}Sn

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Owing to the large number of stable isotopes, Sn provides the opportunity to discriminate nucleosynthetic anomalies from mass-dependent and mass-independent isotope fractionation. Terrestrial basalts and chondrites of our study show Sn isotope patterns consistent with two mass independent isotope fractionation (MIF) processes: the nuclear volume and the magnetic isotope effects. The origin of the isotope fractionation is unclear but a sample preparation induced fractionation seems unlikely as different groups of chondrites show systematic patterns, hence pointing towards unknown natural geo/cosmochemical processes.

After considering mass-independent and mass-dependent effects, there is no evidence of nucleosynthetic anomalies, as observed for other moderately volatile elements.

The ^{115}Sn/^{120}Sn chondrite data correlates with In/Sn content and it is consistent with ^{115}In decay over the age of the solar system. This represents the first evidence of the ^{115}In-^{115}Sn decay system in natural samples.

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