

Iron isotope anomalies of AOAs in CV chondrites

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Iron isotopic anomalies of bulk meteorites can provide key constraints on the nature and location of planetesimal formation in the circumstellar disk [1]. However, in order to fully understand the Fe isotopic signatures of bulk meteorites, it is essential to know the isotopic compositions of their nebular building materials. To this end, we here present the Fe isotopic compositions of 7 AOAs from the CV Allende chondrite, whose O-, Ti-, and Cr-isotopic compositions have been found to be indistinguishable from the ones of CAIs [2]. The AOAs show light mass-dependent Fe isotopic compositions and Fe isotope anomalies, expressed as $\mu^{54}\text{Fe}$, similar to, or slightly more negative, than bulk Allende. Although alteration processes overprinted the original Fe isotopic composition of the AOAs, we infer that their initial $\mu^{54}\text{Fe}$ composition must have been null to negative. This is in agreement with mineral separates from the CAI Egg-2 [3], and indicates that CAI-/AOA-like metals are an important component in setting the Fe isotopic composition of bulk meteorites.

[1] Hopp, T. et al. (2022) *Sci. Adv.* 8:eadd8141. [2] Jansen, C. et al. (2024) *EPSL* 627:118567. [3] Shollenberger, Q. R. et al. (2019) *GCA* 263:215–234.