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Isotopic signatures of CAIs from CV3 and CK meteorites: source implications

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Studying the stable isotope compositions of CAIs—the first solids to form in the Solar System— provides clues to the formation and earliest evolution of our Solar System. CAIs from the Allende meteorite appear to be isotopically uniform, yet distinct from terrestrial standards in a number of elements [i. e., 1]; however, little work has been done on CAIs originating from meteorites other than Allende. Here we present the Sr, Ba, Nd, and Sm isotopic compositions of four non-Allende CAIs: two from CK chondrites and two from CV chondrites. From the results, these CAIs appear to have original isotopic signatures indistinguishable from Allende CAIs, further suggesting a homogenous CAI reservoir. However, evidence for subsequent neutron capture on ^{149}Sm is present in some samples. Thus, if CK and CV meteorites originate from a single undifferentiated chondritic crust [2], neutron capture signatures of such samples could be a useful tool in determining the depth at which these samples were sourced.

[1] Brennecka et al. (2013) *PNAS*, 110, 17241. [2] Elkins-Tanton et al. (2011) *EPSL*, 305, 1.

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