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Chemistry and oxygen isotopic composition of cluster chondrite clasts and their components.

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Cluster chondrites are a specific type of chondritic rock, characterized by close-fit textures of deformed and indented chondrules. Their textures have been taken as evidence for ultra-rapid chondrite formation by hot chondrule accretion [1]. We measured the bulk oxygen isotopic and chemical composition of 7 cluster chondrite clasts, including concentrations of REE, Zr, and Hf. The same parameters were measured *in-situ* on 93 cluster chondrite chondrules and 4 interchondrule matrix areas.

Results and conclusions: Based on strong chemical similarities we conclude that cluster chondrites represent normal UOC material with a different accretion history. Prior to accretion certain amounts of fine-grained material (matrix and opaques) were extracted. We found evidence for oxygen isotope exchange between chondrule melts and ¹⁸O-rich ambient gas, since chondrules scatter along a mixing line with a slope of 0.63 in the oxygen 3-isotope diagram. In one clast a distinct anticorrelation between chondrule size and δ¹⁸O value is found. This possibly results from a more intense oxygen isotope exchange between the gas and smaller chondrules due to their higher surface/volume ratio.

+ [1] Metzler, K. (2012) MAPS 47, 2193-2217.

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