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Solar system primordial water and dust: insights from *in-situ* oxygen analyses of CI chondrites

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O-isotopic composition of CI chondrites is a fundamental tool to constrain the origin of dust and water ice grains in the protoplanetary disk. We mechanically isolated olivine and carbonate grains from the CI Orgueil and measure their O-isotope compositions by SIMS.

Olivine grains are Mg-rich with Fo_{88-95} and show Earth-like O-isotope compositions plotting at the intersection of the TFL and PCM. Chondrules could therefore represent a constituent of CI chondrites but this does not imply that the mechanism(s) at the origin of chondrules operated in the CI-forming region as they could have been inherited from other chondrule-forming regions.

SIMS in-situ analyses show Ca-carbonates define a trend that is indistinguishable from TFL. Our data show that CIs are chemically solar but isotopically terrestrial for oxygen isotopes. The ^{16}O-poor composition of CI anhydrous particles supports models where primordial Solar System dust is characterized by terrestrial values [1].

[1] Krot, A. N et al. (2010) ApJ 713,1159–1166.

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