OXYGEN ISOTOPE EXCHANGE IN OC CHONDRULES.

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Introduction: In order to accurately determine the effects of parent body fluid-rock interaction on O-isotope partitioning between different phases in OC chondrules, we are determining their $\delta^{17}O$ and $\delta^{18}O$ values. It has previously been shown, using density separates and cristobalite-rich clasts, that there is a mineralogical control to positions along OC mixing lines between ^{16}O-rich e.g. olivine, pyroxene and ^{16}O-poor e.g. feldspar, cristobalite compositions [1,2]. Using high resolution SHRIMP analyses allows detailed analyses of individual grains in chondrules.

Methods: Chondrules from Chainpur LL3.4, and Adrar003 L/LL3.2 were analysed with the SHRIMP-SI operating in multiple collection mode. A medium energy electron beam (ca. 2.7 keV) was used to neutralize charge build up from the Cs primary beam. Oxygen analyses were normalized to pyroxene from the FC1 locality for zircon standards [3].

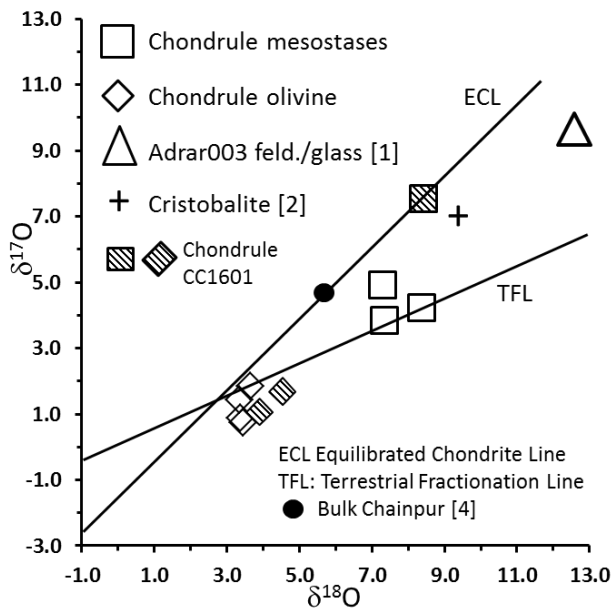

Figure 1. O-isotopes of Chainpur chondrules' (CC1507 open squares and diamonds; CC1601 cross-hatched) olivine and mesostasis. 95% CL lie within the points.

Results and Discussion: Olivine has O-isotopes close to TFL and reproducing within 0.5 permil (Fig. 1). The data are normalized to an Fe-rich pyroxene and so there may be an instrumental mass-dependent fractionation. CC1601 has complementary ^{16}O-poor feldspathic mesostasis located between ECL and TFL suggesting mass-dependent fractionation as well as mixing with outer Solar System ^{16}O-poor water [1]. In CC1507, the water was closer to equilibrium with the parent body.

References: [1] Bridges J. C. et al. 1999. *GCA* 63:945-951. [2] Bridges J. C. et al. 1995. *Meteoritics* 30:715-727. [3] Paces J. B. and Miller J. D. 1989. *JGR* 98:13997-14013. [4] Clayton R. N. et al. 1991. *GCA*, 55:2317-2337.