COMPOSITIONS OF FOUR LOW-FeO ORDINARY CHONDRITES.

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Introduction: The H, L and LL groups of ordinary chondrites, account for a majority of known chondritic meteorites [1] and are distinguished from each other through differences in bulk chemical and isotopic composition, chondrule size and oxidation state [e.g. 2]. Each of these attributes was primarily established prior to accretion within the solar nebula and/or by incorporation of nebular components in slightly varying amounts. However, some ordinary chondrites (OC) cannot be easily placed within any one of the H, L or LL categories. For example, a small quantity of ordinary chondrites (OC) contain unusually low amounts of FeO in their silicates. These chondrites are sometimes collectively referred to as reduced OC [3,4,5].

Methods and Samples: Burnwell, LAP 04757, EET 96031, and MIL 07273 are four specific examples of these reduced OC. We quantified 46 trace elements by ICPMS using a ThermoElemental X-Series II ICPMS with a technique well established for chondritic meteorites [6]. ICPMS data was collected for Burnwell, LAP 045757, and EET 96031 and results for MIL 07273 will be available by meeting time. We also collected synchrotron x-ray microtomography (µCT) data on the same samples at the GSECARS 13-BM beamline located at the Advanced Photon Source of the Argonne National Laboratory. Finally, we analyzed the O isotopic compositions of LAP 04757 and EET 96031 [see 7]. We are in the process of analyzing or reanalyzing the oxygen isotopes of samples of MIL 07273 and the Burnwell chondrites.

Results and Discussion: Oxygen isotopes of LAP 04757 and EET 96031 are within the range of values established for H chondrites as are trace element and µCT-derived opaque mineral abundance data. Aside from previously published oxygen isotope data [5], Burnwell's overall composition seems nearly identical to the H chondrites. We anticipate our new O isotope results to further clarify this relationship, if any. The primary difference between the low-FeO chondrites and the H chondrites is the lower Fa mol% present. Given this, we prefer a common origin asteroidal origin for the low-FeO and H chondrites.

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