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OXYGEN ISOTOPE DATA FOR CLASSIFIED SEMARKONA CHONDRULES. D. W. G. Sears[1], S. Huang[1], P. H. Benoit[1], I. A. Franchi[2], A. S. Sexton[2], and C. T. Pillinger[2], [1]Cosmochemistry Group, Department of Chemistry, University of Fayetteville, Fayetteville AR 72701, USA, [2]Planetary Sciences Research Institute, Open University, Milton Keynes MK7 6AA, UK.

Considering its status as the least-metamorphosed (and in this sense most primitive) ordinary chondrite [1], remarkably few O isotope data exist for components from the Semarkona meteorite. Clayton measured four chondrules and six matrix samples [2], but the chondrules were either unclassified or were group B, the largest chondrule group. Most interesting are group A, because they appear to have undergone a number of chemical and physical changes during formation and it is possible that some of these may be related to the origin of the various chondrite classes [3]. Most chondrules and matrix samples plot above the terrestrial line on the O three-isotope plot, although an inclusion in ALH A76004 (LL3.4) and several isolated olivine grains in Julesburg (L3.6) plot well below the line [4,5]. The Julesburg olivines contained low Fa and showed bright CL, albeit red rather than blue, suggesting a connection with group A chondrules. We therefore thought it useful to measure the O isotope properties of group A chondrules from Semarkona.

Nine Semarkona chondrules were removed by chiseling from thick sections, CL images indicating that four were group A1,2, two were A5, and three were B1. They were analyzed by the laser fluorination technique [6]. The results are shown in Fig. 1, along with literature data for components from Semarkona. Replicate analyses of fragments of one chondrule revealed a spread in $\delta^{18}O$ of almost 1‰ along a line parallel to the ECL line, indicating considerable heterogeneity within individual chondrules. Other, homogenized powdered materials show that the reproducibility is better than 0.1‰ [6]. Our data agree well with previous results. None of the present group A chondrules plot below the terrestrial line. There appears to be no major systematic difference between group A and B chondrules, although group A arguably show greater scatter.

Conclusions: (1) Group A and B chondrules had similar starting materials, despite major differences in the present redox and volatile-element properties. This could suggest that the redox and compositional differences are due to the chondrule-forming process rather than precursors. (2) If the chondrite classes had common ancestry, then OC chondrules suffered multiple recycling in the manner suggested by Clayton et al. [2] in order to display the present clustering of their O isotope compositions. (3) It is possible that A and B chondrules differ significantly in O isotopic signature as may be the case in Chainpur and Parnallee [7], but the present data for chondrules from Semarkona suggest that this conclusion may be premature. (4) Isolated grains reported by Saxton [4] were probably not derived from group A chondrules from the same meteorite. They may be exotic.

References: [1] Huang S. et al. (1996) *Icarus, 122*, 316. [2] Clayton R. N. et al. (1991) *GCA, 55*, 2317. [3] Huang S. et al. (1996) *JGR, 101*, 29373. [4] Saxton J. M. et al. (1996) *Meteoritics & Planet. Sci., 31*, A123. [5] Mayeda T. K. et al. (1980) *Meteoritics, 15*, 330. [6] Franchi I. A. et al. (1997) *LPS XXVIII*, 379. [7] Bridges et al. (1997) *LPS XXVIII*, 155.

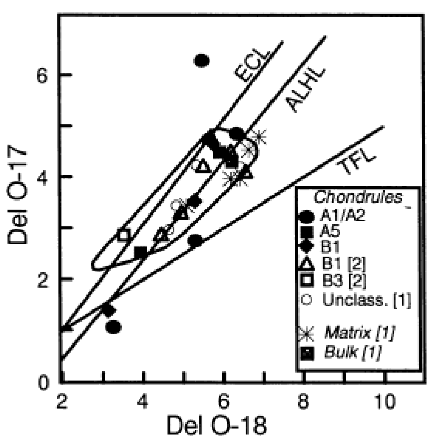

Fig. 1. Oxygen isotope data for components from the Semarkona LL3.0 chondrite. TFL, ECL, and ALHL refer to fractionation lines displayed by terrestrial samples, equilibrated ordinary chondrites, and ALH A76004 (LL3.2/3.4).