

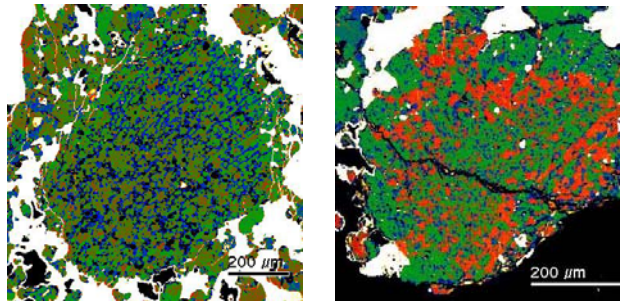
OXYGEN ISOTOPES IN BRACHINA, SAH 99555 AND NORTHWEST AFRICA 1054

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Brachina: Oxygen isotope analyses by laser fluorination of two whole rock fragments (provided by M. Wadhwa) gave $\delta^{17}\text{O} = 1.59, 1.38$; $\delta^{18}\text{O} = 3.60, 3.21$; $\Delta^{17}\text{O} = -0.304, -0.307$ per mil. These $\Delta^{17}\text{O}$ values are more negative than earlier measurements ($\Delta^{17}\text{O} = -0.20$) [1], and also more negative than values for **NWA 595** and **NWA 3151**, which have petrologic characteristics like brachinites [2]. We re-measured NWA 595 after more thorough acid-washing to remove terrestrial oxidation and obtained slightly different results from those we reported previously [2]: $\delta^{17}\text{O} = 2.11, 2.36, 2.33$; $\delta^{18}\text{O} = 4.33, 4.77, 4.78$; $\Delta^{17}\text{O} = -0.173, -0.162, -0.197$ per mil. **NWA 4042** is petrologically and isotopically similar ($\Delta^{17}\text{O} = -0.154$) [3], and may be related to NWA 595 and NWA 3151 (with $\Delta^{17}\text{O} = -0.15 \pm 0.02$). However, if all these specimens (including Brachina) derive from the same parent body, then it must be isotopically quite heterogeneous.

Angrite SAH 99555: Analyses of disaggregated silicate material (provided by T. Kleine) gave $\delta^{17}\text{O} = 2.20, 2.06$; $\delta^{18}\text{O} = 4.32, 4.06$; $\Delta^{17}\text{O} = -0.077, -0.078$ per mil, which are essentially identical to results obtained for other angrites [4].

NWA 1054 is not an acapulcoite but a chondrite related to winonaites: Analyses of material (provided by M. Chinellato via N. Classen) gave $\delta^{17}\text{O} = 1.56, 1.44$; $\delta^{18}\text{O} = 3.74, 3.54$; $\Delta^{17}\text{O} = -0.408, -0.425$ per mil. We confirm that olivine is Fa_6 [5] and that chondrules definitely are present (see BSE images). Thus we infer that NWA 1054 is a Type 5 or 6 chondrite related to winonaites not acapulcoites (see [6]), and is likely paired with (or even part of the very same stone as) NWA 725, NWA 1052, NWA 1058 and NWA 1463 (which could usefully be termed “W chondrites”).



References: [1] Clayton R. and Mayeda T. 1996) *GCA*, 60: 1999-2018 [2] Irving A. et al. 2005 *MAPS* 40: A73 [3] Connolly H. et al. 2006 *Meteorit. Bull.* 90 [4] Greenwood R. et al. 2005 *Nature* 435: 916-918; Irving A. et al. 2005 *Trans. AGU* 86, #P51A-0898 [5] Moggi-Cecchi V. et al. 2005 *LPS XXXVI*, #1808 [6] Rumble D. et al. 2005 *MAPS* 40: A133.