ACHONDRITIC FRAGMENTS IN ORDINARY CHONDRITE BRECCIAS.

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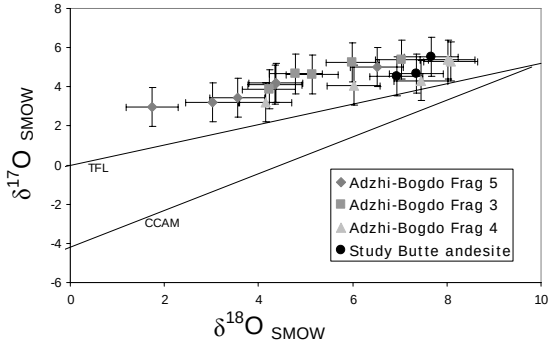
Introduction: The chondrite regolith breccia Adzhi-Bogdo (LL3-6) contains several lithic fragments with igneous textures which are best described as akali-granitoids [1]. In the breccia Study Butte (H3-6) one igneous-textured fragment with an andesitic bulk composition was observed [2]. Since these fragments most likely formed by melting and magmatic differentiation on a parent body, their occurrence indicates mixing of achondritic fragments with chondritic components. Al-Mg isotope data for these igneous-textured clasts reveal no evidence for radiogenic ^{26}Mg and indicate that the formation of these igneous clasts, the incorporation into the parent body regolith, and the lithification must have occurred late, after almost all ^{26}Al had decayed [3].

In order to determine whether the fragments formed on their present parent bodies or whether they represent fragments of an achondritic projectile, oxygen isotope ratios were measured.

Results: In situ measurements of plagioclase, quartz and pyroxene in the fragments are presented in Figure 1. All fragments fall in the range of ordinary chondrites.



Discussion: The results imply that the fragments derive from an ordinary chondrite precursor or formed on a parent body within the same oxygen isotope region of the solar nebula as ordinary chondrites. Thus, the granitic fragments may have formed on the same parent body as the surrounding host rock material. The andesite data falls in the range of LL chondrite although its host rock is a H3-6 chondrite. Inclusions of ordinary chondrites within other ordinary chondrites have been described by Bischoff et al. [5]. The present results may indicate that melt formation and extreme differentiation on ordinary chondrite bodies occurred in the early stage of solar system formation. The relatively large range in δ^{18}O within the clasts is mass dependent and may show isotope fractionation on the parent body during the differentiation process.

References:

[1] Bischoff A. et al. (1993), *Meteoritics* **28**, 570-578. [2] Fredriksson K. et al. (1989), *Z. Naturforschung* **44a,** 945-962. [3] Sokol A.K. et al. (2007), *Meteoritics & Planetary Science*, submitted. [5] Bischoff et al. (2006), In "*Meteorites and the Early Solar System II"* (eds. D.S. Lauretta and H.Y. McSween Jr.), 679-712, Univ. of Arizona, Tucson.