U-series isotope data on Deception Island volcanic rocks

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New U-series isotope data are presented for 21 basaltic to dacitic rocks from the Deception Island, South Shetlands, West Antarctica. The Quaternary volcanic island lies within a backarc basin called the Bransfield Strait [1]. Trace element data indicate lack of significant influence of fluid or subducted sediment components.

U, Th, and Ra concentrations and isotopes were analyzed by isotope dilution on the Nu Plasma MC-ICP-MS in dry plasma mode at the University of Illinois, Urbana Champaign. U and Th concentrations are relatively low and range from 0.23-1.12 ppm (median 0.45) and from 0.72-3.73 (1.38) ppm. A few samples had $^{234}U/^{238}U$ above secular equilibrium indicating seawater influence. The ($^{230}Th/^{238}U$) is close to equilibrium with a few ranging up to 1.1. The ($^{226}Ra/^{230}Th$) ratios range from within error of equilibrium to 1.4.

[1] Gonzalez-Casado, J.M., Giner-Robles, J.L. & Lopez-Martinez, J. (2000) *Geology* **28,** 1043-1046.

Impactor metal in gabbroic lunar meteorite Northwest Africa 5000

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The Moon's surface experienced intense bombardment by a population of planetesimals that are not represented in our meteorite collections [1]. Abundant metal grains (up to 4 mm) occur both in gabbro clasts and matrix of lunar meteorite NWA 5000, a highlands feldspathic breccia [2] providing compositions of the impactor. Abundances of Si, P, Cr, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Mo, Ru, Rh, Pd, W, Re, Os, Ir, Pt, and Au, were measured by laser ablation ICP-MS on a polished slab using a UP213-Element system [3]. Two large metal grains are unzoned (except for Ga) and have identical, approximately chondritic, compositions similar to metal from Apollo 16 breccias [4]. The Ni/Fe and Co/Fe ratios are similar to those in ordinary chondrites, but both metal grains are enriched in As/Ni and Au/Ni at ~2xCI, compatible with enstatite chondrite metal. The CI-normalized Re-Os-Ir-Ru-Au pattern matches PGE patterns of enstatite chondrite metal better than that of ordinary chondrite metal, but the NWA 5000 metal grains exhibit subchondritic Pd/Ir, unlike enstatite or ordinary chondrite metal. The siderophile element fractionation pattern does not fit any known iron meteorite group; both incompatible elements (As, Au) and compatible elements (Re, Os) are enriched relative to Ir. Abundances of Cu, Ga and Ge are depleted relative to chondritic metal, and a diffusion profile over ~1 mm from metal-rich regions into an anorthosite clast in the matrix confirms that Ga was mobile.

The presence of exotic metal as xenocrysts within clasts having apparent plutonic igneous texture suggests that the dominant gabbroic lithology in NWA 5000 was a product of large-scale impact melting. The impactor had a fractionated siderophile element pattern reminiscent of that in enstatite chondrites, but with a subchondritic Pd/Ir ratio, and might represent processed material from the inner solar system.

[1] Norman M. *et al.* (2002) *EPSL* **183**, 217-228. [2] Irving A. *et al.* (2008) *LPS XXXVIIII*, #2168. [3] Humayun M. *et al.* (2007) *GCA* **71**, 4609-4627. [4] Korotev R. *et al.* (2003) *LPS XXXIV*, #1487.