

GEOCHEMISTRY AND PETROLOGY OF LUNAR METEORITE DHOFAR 1428. Y. Hidaka¹, A. Yamaguchi², and M. Ebihara¹, ¹Department of Chemistry, Tokyo Metropolitan University, Tokyo 192-0397, Japan. E-mail: hidaka-yoshihiro@ed.tmu.ac.jp. ²National Institute of Polar Research, Tachikawa 190-8518, Japan.

Introduction: Dhofar 1428 is a 213 gram lunar meteorite with little fusion crust found in Oman in 2006, and was classified as a feldspathic impact melt breccia [1]. Here, we report petrology and geochemistry of Dhofar 1428.

Results and Discussion: Polished thin section (PTS) was made from a chip located adjacently to the fraction used for chemical analyses, and was examined optically and with SEM and EPMA. The PTS shows a breccia composed of lithic clasts and mineral fragments of plagioclase, pyroxene and olivine (< 2.5 mm) set in a dark glassy matrix. The lithic clasts include polycrystalline igneous clasts, breccia clasts, and dark impact melts. A few clasts contain K-rich feldspar and Ca-phosphates. There is an ellipsoidal brown glass. Compositions of plagioclase vary ($An_{96.6-68.2}Or_{0.2-9.5}$). Mg' (= molar $Mg/(Mg+Fe)$) of mafic minerals have fairly wide ranges (low-Ca pyroxenes: 26.6-83.6; olivine: 50.3-81.6).

We performed bulk chemical analyses using NAA and ICP-MS. Dhofar 1428 contains 28.7 wt. % Al_2O_3 , 4.30 wt. % FeO and 4.67 wt. % MgO, which are within the range of Apollo FAN rocks [2]. Bulk molar $Na/(Na + Ca)$ ratio and bulk Mg' value (66) are also within the range of FAN. Clearly, Dhofar 1428 is mostly composed of FAN materials. Compared to FAN, Dhofar 1428 has a slightly high content of K, which is consistent with the presence of K-rich plagioclase in our thin section. The REE abundances of Dhofar 1428 are slightly higher than those of typical FANs. These data indicate that Dhofar 1428 contains small amounts of KREEP materials, which is consistent with the presence of the clasts that contain Ca-phosphates and K feldspar. Thus, this meteorite was derived from a location in or close to the Procellarum KREEP Terrane [3].

Siderophile element contents of Dhofar 1428 are 185 $\mu g/g$ for Ni, 6.3 ng/g for Ir and ~2.9 ng/g for Au, which are among concentration levels for feldspathic lunar meteorites. The Ni/Ir ratio is almost the same as that for CI-chondrite, while the Ir/Au ratio is lower than CI values, suggesting that the projectile was relatively enriched in Au compared with CI chondrite, like enstatite chondrites.

References: [1] Bunch T. E. et al. 2006. *Meteoritics & Planetary Science* 69:A5254. [2] Haskin et al. 1981. 12th Lunar and Planetary Science Conference. pp. 41-66. [3] Jolliff B.L. et al. 2000. *Journal of Geophysical Research* 105: 4197-4216.