**TRACE ELEMENT GEOCHEMISTRY OF THE BASALTIC SHERGOTTITE NORTHWEST AFRICA 2975**

M. E. Sanborn[1] and M. Wadhwa[1] [1]School of Earth and Space Exploration, Arizona State University, Tempe, AZ 85287-1404. E-mail: Matthew.Sanborn@asu.edu.

**Introduction:** Northwest Africa (NWA) 2975 is a recently recovered basaltic shergottite from the hot desert region of northern Africa. It is a medium-grained basalt composed primarily of clinopyroxene and maskelynite with accessory opaque phases and phosphates [1]. An initial characterization of the petrology and mineralogy of NWA 2975 indicates that it is one of the more geochemically evolved basaltic shergottites identified thus far [1], with only the Los Angeles and Dhofar 378 shergottites having more Fe-rich pyroxene core compositions [2,3]. Here, we report rare earth element (REE) and selected additional trace and minor element abundances in individual minerals of NWA 2975 with the goal of constraining its petrogenetic history and clarifying its relationship to the other known shergottites.

**Results and Discussion:** REE were measured in the clinopyroxene and maskelynite of NWA 2975 using the Cameca IMS-6f ion microprobe at Arizona State University. Both the low- and high-Ca pyroxenes are LREE-depleted with negative Eu anomalies ($Eu/Eu^*$~0.6-0.8). REE abundances in the pyroxenes exhibit a moderate range (La ~0.13-0.35 × CI in the low-Ca pyroxenes ~0.39-0.50 × CI in the high-Ca pyroxenes). These abundances are quite comparable to those observed in clinopyroxenes of the highly evolved basaltic shergottite Dhofar 378 (La ~0.1-0.2 × CI for low-Ca pyroxenes and La ~0.3 × CI for high-Ca pyroxenes) [3]. In addition to REE, the abundances of additional trace and minor elements (e.g., Y, Zr, and Ti) were measured in the low-Ca pyroxenes, and these fall within the compositional range defined by low-Ca pyroxenes in the other basaltic shergottites [4]. Maskelynite in NWA 2975 is moderately LREE-enriched (CI-normalized La/Tb ~3.8-4.1) with a positive Eu anomaly ($Eu/Eu^*$~50). The maskelynite REE pattern and abundances are similar to those in other enriched basaltic shergottites [4].

**Conclusion:** The REE patterns and abundances in the minerals of NWA 2975 (in particular, the clinopyroxene) indicate that its parent melt had a trace element composition similar to that of the parent melts of the other enriched basaltic shergottites. The relatively elevated abundances of REE and other trace elements in clinopyroxenes of NWA 2975 further support the suggestion based on its mineralogical-petrological characteristics [1] that it is one of the more geochemically evolved basaltic shergottites.

**References:** [1] Wittke J. H. et al. 2006. Abstract #1368. 37th Lunar & Planetary Science Conference. [2] Mikouchi T. 2001. *Antarctic Meteorite Research* 14:1-20. [3] Ikeda Y. et al. 2006. *Antarctic Meteorite Research* 19:20-44. [4] Wadhwa M. et al. 1994. *Geochimica et Cosmochimica Acta* 58:4213-4229.