

NWA 1669 – 35.85 grams
Enriched Basaltic Shergottite



Figure 1. Photograph of NWA 1669 by Bruno Fectay and Carine Bidaut. Black and white grid is 1 cm.

Introduction

NWA 1669 was purchased in Erfoud, Morocco, January 2001 by Bruno Fectay and Carine Bidaut and has been referred to as “Al Mala’ika” (Russell *et al.* 2003). It is covered with desert varnish and has only a few patches of fusion crust (figures 1 and 5).

Petrography

Jambon *et al.* (2003) report that NWA 1669 is a fine-grained basaltic rock with two closely “intricated” pyroxenes (pigeonite and augite) with plagioclase that has been converted into maskelynite. Texture is that of a basalt (figure 2). Accessory minerals include merrillite, Cl-apatite, pyrrhotite, ulvöspinel, ilmenite, silica and baddeleyite. It may have melt pockets (figure 4).

Mineral Chemistry

Pyroxenes: Pigeonite $Wo_{9-19} En_{58-25} Fs_{32-61}$
Augite $Wo_{39-24} En_{47-19} Fs_{54-18}$
FeO/MnO = 34.

Maskelynite: $Ab_{41-53} Or_{1-6} An_{58-42}$.

Whole-rock Composition

See figure 3.

Terrestrial calcite (calichi) is present as veins cross-cutting the meteorite (Russell *et al.* 2003).

Other Isotopes

Oxygen isotopes have been reported by Jambon *et al.* (2003) ($\delta^{17}O = 0.30\%$, $\delta^{18}O = 2.85\%$ and $\delta^{16}O = 4.91\%$).

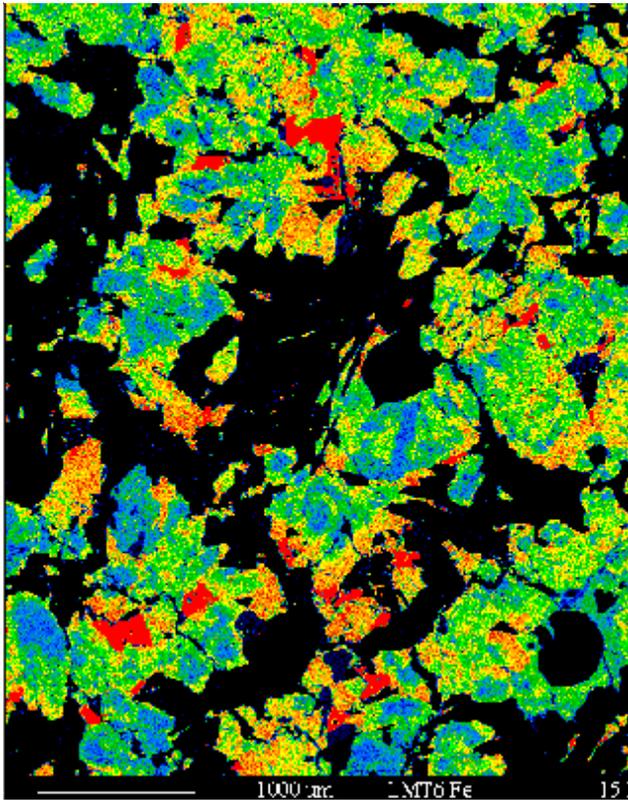


Figure 2: X-ray map (Fe) of large area (4 mm field of view) of NWA1669 kindly provided by Jean-Alix Barrat and Marcel Bohn, showing intergrown maskeynite (black), and two pyroxenes (colors).

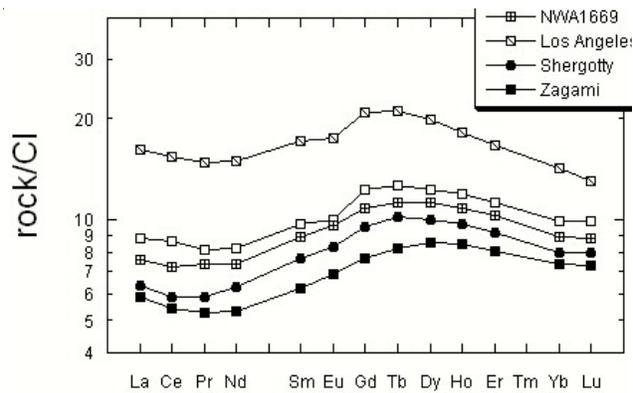


Figure 3: REE diagram kindly provided by J-A Barrat, comparing NWA1669 with other basaltic shergottites.



Figure 4: Slice of NWA1669 (from internet).



Figure 5: Picture of NWA1669 (from JPL web site).

References for NWA1669

- Jambon A., Bohn M., Boudouma O., Chennaoui-Aoudjehane H. and Franchi I. (2003) Al Mala'ika (NWA 1669): A new Shergottite from Morocco /mineralogy and petrology (abs). *Meteorit. & Planet. Sci.* **38**, A43.
- Russell Sara., Zipfel J., Folco Luigi, Jones R., Grady M.M., McCoy T. and Grossman J.N. (2003) The meteoritical bulletin, No. 87, 2003 July. *Meteorit. & Planet. Sci.* **38**, A189-248.