

XXXII. NWA3171

Basaltic Shergottite

506 grams



Figure XXXII-1: Complete NWA3171 stone showing flow lines in the back fusion crust on the shield-like front face. Photo by David Gregory.

Introduction

NWA 3171 is a 506 gram stone, partially broken, partially covered with fresh fusion crust (figure XXXII-1). It was purchased in 2004 by A.A. Aaronson for D.A. Gregory and is apparently from western Algeria. It is apparently very similar to Shergotty and Zagami.

Thin veins of black glass leading to shock melt pockets can be seen in photos of the sawn surface (figure XXXII-2).

Petrography

This Martian basalt consists of approximately equal amounts of pyroxene and plagioclase (figure XXXII-3). Accessory phases include ulvospinel, ilmenite, chlorapatite, merrillite, pyrrhotite, Na-K-Al-Si glass, silica, and rare baddeleyite. Rare calcite, barite and minor rust staining are also present in this desert find (Irving et al. 2004).

Additional petrographic detail and figures can be found at <http://www2.jpl.nasa.gov/snc/nwa3171.html>.

Mineralogy

Pyroxene: The composition of pyroxene in NWA3171 is given in figure XXXII-4 (Irving et al. 2004).

Plagioclase: The plagioclase is shocked to maskelynite (An_{41-54}).

Chemistry

None

Radiogenic age dating

None

Other Studies

Oxygen isotopes for NWA3171 are $\delta^{18}O = 4.56 \pm 0.1$, $\delta^{17}O = 2.77 \pm 0.1$ and $\delta^{16}O = 0.40 \pm 0.06$ ‰ (as determined by T. Larson and F. Longstaffe, Univ. Western Ontario).



Figure XXXII-2: Sawn surface of NWA3171 (photo by Greg Hupe).



Figure XXXII-3: Thin section photomicrograph showing texture of NWA3171 (photo by Tony Irving and Scott Kuehner). Scale is 1.5 cm across. Note the thin shock veinlet (black glass) and brown alteration stain.

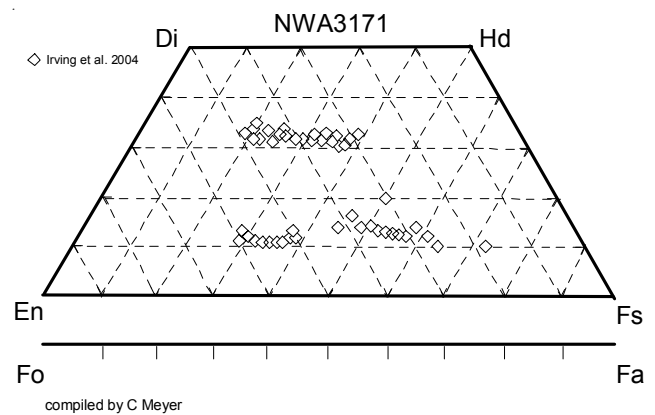


Figure XXXII-4: Pyroxene diagram for NWA3171 (data replotted from Irving et al. 2004). Does this remind you of Zagami?