

## NWA 4301 Zakłodzie-Like Ungrouped Enstatite meteorite

### Specimen Information:

**Name:** NWA 4301 Ungrouped Enstatite

**Weight:** 25.4 grams

**Measurements:** 84mm x 35mm x 2.5mm

**Description:** Polished Complete Slice

NWA 4301, an exceedingly rare Ungrouped Enstatite-rich Achondrite found in Algeria in 2006 by nomadic tribesman. NWA 4301 is nearly identical to Zakłodzie, both in mineral composition and terrestrial age, about 300 years (The same scientist at NSF Arizona AMS Laboratory measured the terrestrial age dates of both meteorites). If they had not fallen 3000 km apart, NWA 4301 would have been considered a pairing. While that is unlikely, scientists agree they are most likely source launch-paired! The Total Known Weight of NWA 4301 consists of a single 685 gram stone.

Close-up view of NWA 4301 polished slice (depth of field = 2cm across):

<http://www.lunarrock.com/nwa4301/nwa4301closeup.jpg>

### **Scientists write:**

“This meteorite [NWA 4301] is essentially a clone of Zakłodzie, for which ... a very young terrestrial age of several hundreds of years [was found] (even though it is weathered to some extent). I presume that the terrestrial ages of these two are analytically distinguishable, but it could still be that they are launch-paired.”

“NWA 4301 seems much fresher than Zakłodzie...”

“I believe that the [terrestrial ages] are permissive of both stones being part of the same fall, but landing 3000 km apart in Poland and Algeria. Of course there is a very large uncertainty, so it does not prove it, but the two meteorites are remarkably similar and different from anything else.”

*Approved classification published in Meteoritical Bulletin 91 for NWA 4301:*

### **Northwest Africa 4301**

Mauritania or Algeria

Find: April 2006

Enstatite achondrite (ungrouped)

**History:** Purchased in April 2006 by G. Hupé from a Moroccan dealer in Rabat.

**Physical characteristics:** A single 685 g stone with some reddish external weathering.

**Petrography:** (A. Irving and S. Kuehner, *UWS*)

Subequigranular igneous cumulate texture with relatively coarse-grained (0.2–0.8 mm) silicate, metal, and sulfide grains. Composed mainly of polysynthetically twinned pure enstatite = 70 vol% and kamacite = 15 vol%, with subordinate interstitial plagioclase = 10 vol% and troilite = 5 vol%. Micrometer-size blades and blebs of kamacite and rare daubreelite also occur as inclusions within enstatite.

**Mineral composition:** Plagioclase ( $An_{30.7-37.6}Or_{1.8-1.3}$ ).

**Classification:** Enstatite achondrite (ungrouped). Terrestrial weathering has produced some limonite along grain boundaries. This specimen is very similar in texture and mineral compositions to Zakłodzie.

**Type specimen:** A total of 22.9 g, one polished thin section and one polished mount, are on deposit at UWS. *G. Hupé* holds the main mass.

Zakłodzie material has regularly been selling for up to \$250.00 per gram, making NWA 4301 an exceptional value! Every specimen of NWA 4301 has been expertly cut and polished by one of the best mineral craftsmen there is. All specimens come with an identification card from The Hupé Collection of meteorites.

**Authenticity Guaranteed:** As a member of the International Meteorite Collectors Association (I.M.C.A.), a nonprofit corporation that adheres to the strictest standards of authenticity. I have been a member of the I.M.C.A. since its inception and I adhere to the most stringent Code of Ethics in the industry. *My IMCA member number is 3163.*

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