

**MORE AFRICAN ENSTATITE-RICH METEORITES:
AUBRITE NWA 2828, ZAKŁODZIE-LIKE NWA 4301,
NWA 1840 AND EL6 CHONDRITES**

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Several very different types of enstatite-rich meteorites have been found recently in Northwest Africa.

Aubrite NWA 2828: Pale gray microbreccia composed mainly of twinned enstatite with subordinate plagioclase ($An_{13.5-15.3}Or_{3.4}$) and altered troilite (with daubreelite blades). Rare Mn-alabandite, daubreelite, oldhamite, Ti-free troilite, and very rare kamacite specks are enclosed within enstatite.

Zakłodzie-Like Enstatite Achondrite NWA 4301: Mainly twinned pure enstatite with subordinate kamacite plagioclase ($An_{31-38}Or_{1.6}$) and troilite with subequigranular igneous cumulate texture (very similar to Zakłodzie [1]).

Enstatite Achondrite NWA 1840: Igneous texture with no chondrules; predominantly twinned enstatite with minor maskelynite (An_{42}), Si-bearing metal and Cr-rich troilite.

EL6 Chondrites NWA 3102 and NWA 3134: Very fresh (W0) paired specimens composed of enstatite ($En_{98.6-99.3}Wo_{1.2-0.6}$, 0.16-0.22 wt.% Al_2O_3) and metal (1-2 wt.% Si) with subordinate sodic plagioclase ($An_{9.9-11.9}Or_{6.0-4.7}$), troilite (Ti-poor, with rare daubreelite blebs), alabandite and fresh oldhamite. Rare partial chondrules are present.

EL6/7 Chondrite NWA 2965: Numerous small stones (probably paired with NWA 002 and NWA 1067) evidently are fragments of a very large (>100 kg), broken enstatite-rich meteorite characterized by compression fractures filled with terrestrial limonite and an overall metamorphic texture. We interpret rare round aggregates of fanning prismatic enstatite grains (in 1 out of 4 thin sections) to be recrystallized former RP chondrules. We suspect that **NWA 2736** (classified as an aubrite by [2]) may be part of this same material.

Oxygen Isotopic Compositions: Means of replicate analyses by laser fluorination: NWA 2828 $\delta^{17}O = 2.895$, $\delta^{18}O = 5.530$, $\Delta^{17}O = -0.017$; NWA 1840 $\delta^{17}O = 2.793$, $\delta^{18}O = 5.229$, $\Delta^{17}O = +0.043$ per mil ($m_{TFL} = 0.526$). Analyses of NWA 2965, NWA 3134 and NWA 4301 are in progress.

Conclusion: We propose that all of these enstatite-rich meteorites originated on the same (fairly large) parent body. As we have argued for the CR parent body [3], there is evidence for a regolith which has been metamorphosed to varying degrees, as well as igneous rock bodies (NWA 011/2400 vs. aubrites) produced by internal partial melting.

References: [1] Przylibski T. et al. 2005 *MAPS* 40: A185-A200; Grossman J. 2000 *Meteorit. Bull.* 84; Patzer, A. et al. 2002 *MAPS* 37: 823-833 [2] Lowe J. et al. 2005 *LPS XXXVI*, #1913 [3] Bunch T. et al. 2005 *LPS XXXVI*, #2308.