

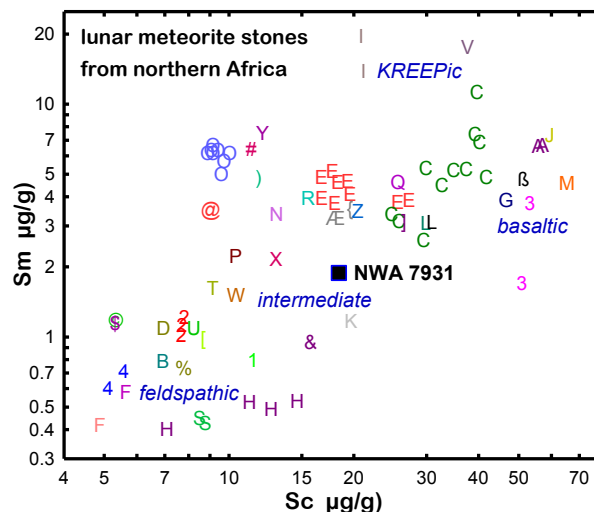
PETROLOGY AND COMPOSITION OF UNPAIRED 5.9 GRAM LUNAR FELDSPATHIC REGOLITHIC BRECCIA METEORITE NORTHWEST AFRICA 7931.

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A small (5.92 gram) stone lacking fusion crust purchased in Agadir, Morocco in 2013 is a unique and unpaired lunar feldspathic meteorite. A second 2.41 gram stone of somewhat similar appearance acquired with it (and thought to be the same) was shown instead to be a eucrite breccia (NWA 8117). The strategy adopted by the Planetary Studies Foundation with these and other small but scientifically important meteorites is to acquire the entire mass for archiving in our collection, to conduct minimal analyses sufficient for proper classification, and to discourage further destructive analysis so that the specimens can be preserved intact for future educational and research purposes.

Petrography: All of our petrographic and mineralogical analyses were accomplished on a polished surface carefully prepared on one side of the stone. NWA 7931 is a feldspathic regolithic breccia consisting of numerous small mineral clasts in a partly glassy, vesicular matrix. Minerals present include anorthite, olivine ($\text{Fa}_{44.3-50.2}$; $\text{FeO/MnO} = 85-96$), fayalite, pigeonite ($\text{Fs}_{29.8-41.1}\text{Wo}_{11.3-6.6}$; $\text{FeO/MnO} = 52-62$), orthopyroxene ($\text{Fs}_{28.6}\text{Wo}_{1.8}$; $\text{FeO/MnO} = 60$), ferroan subcalcic augite ($\text{Fs}_{54.4}\text{Wo}_{36.4}$; $\text{FeO/MnO} = 63$), ilmenite (with rare baddeleyite inclusions), Ti-rich chromite, troilite and minor kamacite.

Bulk Composition: Six subsamples totaling 158 mg of material were analyzed by non-destructive INAA and EPMA of fused glass (for two INAA subsamples), which gave the following mean abundances: (in wt.%) Al_2O_3 25, FeO 7.5, MgO 6.2; (in ppm) Sc 18, La 3.9, Sm 1.9, Eu 0.76, Yb 1.6, Th 0.6; 13 ppb Ir.



Sc-Sm correlation plot for lunar meteorites from northern Africa [1, 2]. Symbols refer to subsamples of distinct stones.

References: [1] Korotev R. et al. 2009. *MaPS* 44: 1287-1322. [2] Korotev R. and Irving A. 2014. *This conference*.