

SUPPLEMENTARY MATERIALS

Luogufengite: A new nano-mineral of Fe₂O₃ polymorph with giant coercive field

Huifang Xu^{1,*}, Seungyeol Lee¹, and Hongwu Xu²

¹NASA Astrobiology Institute, Department of Geoscience, University of Wisconsin–Madison, Madison, Wisconsin 53706

²Earth and Environmental Sciences Division, Los Alamos National Laboratory, Los Alamos, NM 87545

* Corresponding author:

Prof. Huifang Xu,

Email: hfxu@geology.wisc.edu

1. Supplementary Figure. S1: The instrumental resolution function (the Cagliotti parameters) of 11-BM measured using a LaB6 from (NIST SRM 660a) standard.
2. Supplementary Figure. S2: The XRD pattern with Mo-K α radiation of the treated scoria sample (the same sample of Figure 2).
3. Supplementary Table. S1: *K*-factors for the Phillips CM200.
4. Supplementary electronic file (cif file) (available online).

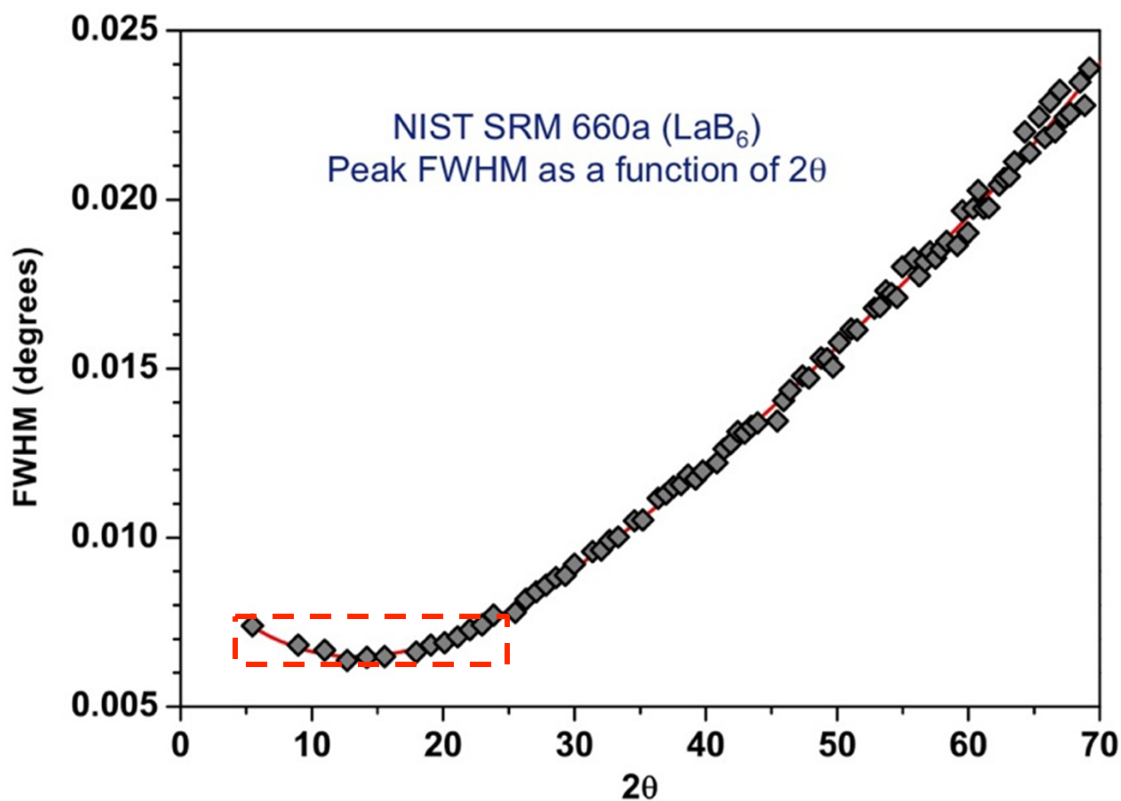


Figure S1. The instrumental resolution function (Cagliotti parameters) of 11-BM measured using a LaB_6 (NIST SRM 660a) standard. The diagram is from the website of beamline 11-BM (<http://11bm.xray.aps.anl.gov/description.html>). The outlined area indicates the scanning angle (2θ) range used for the structural refinement. FWHM is from 0.006° to 0.007° for the 2θ range, and 0.007° was used for instrument resolution in our strain/size analysis.

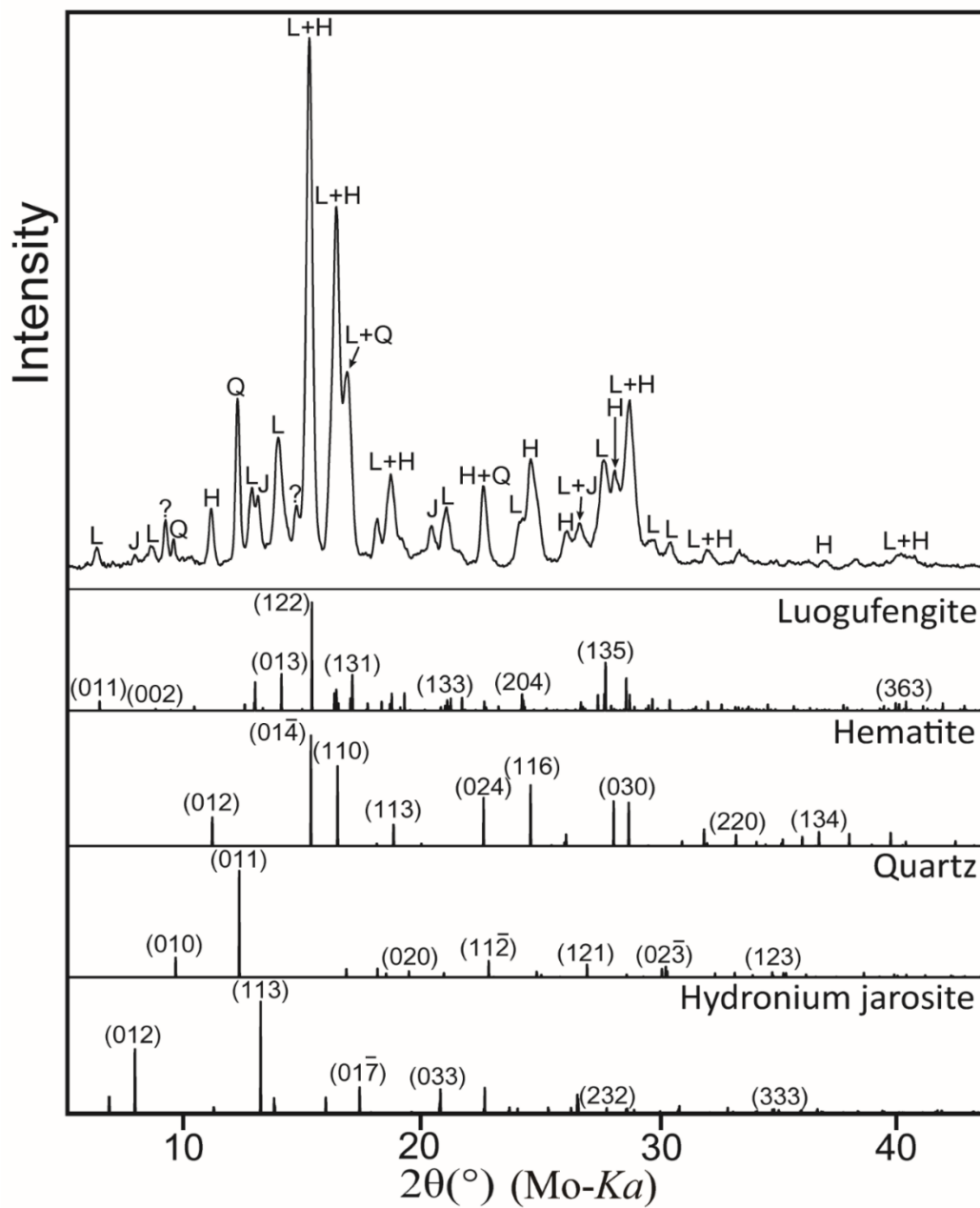


Figure S2. The XRD pattern with Mo-K α radiation of the scoria sample (same sample of Fig. 2).

Peaks with “?” marks are from an unidentified phase.

Table S1. *K*-factors for the Phillips CM200 Ultra Twin TEM^{a,b}.

Element Ratio	Standard	<i>k</i> -factor ($k_{\text{x-Si}}$)
Na/Si	Albite	1.03
Mg/Si	Forsterite	0.90
Al/Si	Anorthite	0.92
K/Si	Orthoclase	0.65
Ca/Si	labradorite (Oregon)	0.66
Fe/Si	Fayalite	0.73
Ti/Si	Titanite	0.68

^aConditions: X-tilt = +10°, Y-tilt = 0°, Spot size = 5

^b*k* is a sensitivity factor that relates elemental peak intensity to concentration:

$$C_A/C_B = k_{AB} * I_A/I_B$$