

Tuesday, March 17, 2015  
**POSTER SESSION I: GEOCHEMISTRY AND PETROLOGY  
 OF MARTIAN METEORITES**  
 6:00 p.m. Town Center Exhibit Area

[T624]

Corrigan C. M. Velbel M. A. **POSTER LOCATION #244**  
[\*Nakhlite Northwest Africa \(NWA\) 5790: Discussions on Cooling Rate, Oxidation State and Lack of Alteration\*](#) [#1642]

Outermost nakhlite/How were your minerals formed?/Let's discuss some clues.

Cohen B. E. Mark D. F. Tomkinson T. Lee M. R. Smith C. L. **POSTER LOCATION #245**  
[\*Martian Igneous Activity and Fluid-Based Alteration: Chronological Constraints from <sup>40</sup>Ar/<sup>39</sup>Ar Analyses of the Nakhlites\*](#) [#1886]

High-resolution <sup>40</sup>Ar/<sup>39</sup>Ar chronology of six nakhlites is used to examine the igneous age and alteration history of this group of martian meteorites.

Lee M. R. Lindgren P. Breton H. Tomkinson T. **POSTER LOCATION #246**  
[\*The Origin of Iddingsite Veins in Olivine from the Nakhlite Meteorites: New Insights from Analogy with CM Carbonaceous Chondrites and Terrestrial Basalts\*](#) [#1778]

Olivine-hosted veins in the nakhlite Lafayette and the CM2 carbonaceous chondrite Murchison show similar microstructures.

Breton H. Lee M. R. Mark D. F. **POSTER LOCATION #247**  
[\*Multiple Aqueous Events in the Nakhlite Meteorite North West Africa \(NWA\) 817\*](#) [#1929]

We study the secondary minerals of the nakhlite Northwest Africa 817 to better understand the geochemical environment in Mars subsurface during the Amazonian.

Breton H. Lee M. R. Mark D. F. **POSTER LOCATION #248**  
[\*Secondary Minerals in the Nakhlite Meteorite Yamato 000593: Distinguishing Martian from Terrestrial Alteration Products\*](#) [#2010]

We analyze aqueous alteration textures and products to identify the impacts that terrestrial fluids may have had on martian alteration products.

Giesting P. A. Filiberto J. **POSTER LOCATION #249**  
[\*Crysal Chemistry and Formation Mechanisms of the Potassic-Chloro-Hastingsite in MIL 03346 and Paired Stones\*](#) [#2396]

The nakhlite MIL 03346 and its paired stones contain high-Cl amphiboles. These require not only high Cl, but high Fe, K, and low H<sub>2</sub>O activity in order to form.

Ling Z. C. Wang Alian. **POSTER LOCATION #250**  
[\*Abundant Bassanite and  \$\gamma\$ -CaSO<sub>4</sub> in MIL 03346, 168 Meteorite\*](#) [#2598]

We found abundant bassanite CaSO<sub>4</sub>·1/2H<sub>2</sub>O in MIL 03346, 168, which agrees with the findings by CheMin on Curiosity rover for Sheepbed mudstone samples.

Howarth G. H. Liu Y. Kohl I. Pernet-Fisher J. F. Wetteland C. et al. **POSTER LOCATION #251**  
[\*Heterogeneous Olivine-Phyric to Pyroxene-Phyric Textures in the Paired Shergottites LAR 12095 and LAR 12240\*](#) [#1360]

Variable textures from olivine-phyric to pyroxene-phyric. Large enstatite megacrysts are observed within a typical basaltic groundmass.

Funk R. C. Brandon A. D. Peslier A. **POSTER LOCATION #252**  
[\*Petrology and Geochemistry of New Paired Martian Meteorites LAR 12095 and LAR 12240\*](#) [#2830]

The paired olivine-phyric shergottites LAR 12095 and 12240 are reduced in terms of oxygen fugacity and may represent a melt with minimal olivine accumulation.

Bellucci J. J. Nemchin A. A. Snape J. F. Kielman R. B. Whitehouse M. J. **POSTER LOCATION #253**  
[A Coherent Pb Isotopic Model for ALH 84001 and Some Enriched Shergottites](#) [#1761]  
 Shergottites and an/Orthopyroxenite linked/By Pb isotopes.

Balta J. B. Sanborn M. E. Udry A. Wadhwa M. McSween H. Y. **POSTER LOCATION #254**  
[Igneous Petrology and Geochemistry of the Tissint Meteorite](#) [#1267]  
 We characterize the igneous petrogenesis of olivine-phyrlic shergottite Tissint, showing it to be a depleted shergottite with several unique characteristics.

Niihara T. Misawa K. Nyquist L. E. Park J. Hirata D. et al. **POSTER LOCATION #255**  
[Complicated Magmatism of Basaltic Shergottites: Implications from Pyroxene Zoning in Zagami](#) [#1721]  
 We conducted petrological and mineralogical studies for multiple lithologies from a single martian basalt, Zagami. We discuss complicated magmatism of Zagami.

Moriwaki R. Usui T. Yokoyama T. Simon J. I. Jones J. H. **POSTER LOCATION #256**  
[Lead Isotope Compositions of Acid Residues from Olivine-Phyrlic Shergottite Tissint: Implications for Heterogeneous Shergottite Source Reservoirs](#) [#1921]  
 Lead isotopic compositions of acid residues from Tissint suggest that its parental magma sampled at least two distinct geochemical source reservoirs.

Leroux H. Jacob D. Marinova M. **POSTER LOCATION #257**  
[Pyroxene Microstructure in Coarse-Grained Clasts Within NWA 7533 Martian Meteorite](#) [#1846]  
 A TEM investigation of four coarse-grained monomineralic pyroxene clasts reveals a microstructure compatible with a slow cooling rate and low shock intensity.

Wirick S. Flynn G. J. Brandes J. Miller L. Smith R. **POSTER LOCATION #258**  
[FTIR and Fluorescence Spectroscopic Analyses of NWA 7034: Organic Terrestrial Contamination and Its Association with High Nickel Regions](#) [#2348]  
 FTIR and X-ray fluorescence spectra were collected on 100-nm-thick sections of NWA 7034. Amide bands were found and were associated with high-nickel hot spots.

Liu Y. Ma C. **POSTER LOCATION #259**  
[Monazite, Chevkinite-Perrierite and Xenotime in Martian Breccia Meteorite NWA 7034](#) [#1287]  
 We report the first findings of rare earth minerals in martian crustal sample NWA 7034 (Black Beauty).

Fassett C. I. Dyar M. D. **POSTER LOCATION #260**  
[Accumulation of Meteoritic Nickel on Mars](#) [#1875]  
 Non-martian nickel/Will accumulate slowly/And mix with Mars soils..

McCubbin F. M. Simonetti A. Shearer C. K. Santos A. R. Day J. M. D. et al. **POSTER LOCATION #261**  
[Composition of Fine-Grained Bulk Matrix and Protobreccia Clast Matrix in Northwest Africa 7034: Implications for the Composition of the Martian Crust](#) [#1723]  
 The composition of the bulk martian crust was estimated using NWA 7034 and compared to previous estimates for the composition of the martian crust.

Tait K. T. Irving A. J. Nicklin R. I. Day J. M. D. Andreasen R. et al. **POSTER LOCATION #262**  
[Petrologic and Isotopic Characterization of Enriched Mafic Shergottite Northwest Africa 8679](#) [#2709]  
 Northwest Africa 8679 is a 285-gram new enriched mafic shergottite found in Morocco in 2014, with compositional and mineralogical similarities to Zagami.

Brandenburg J. E. **POSTER LOCATION #263**  
[Evidence for Large, Anomalous Nuclear Explosions, on Mars in the Past](#) [#2660]  
 It was hypothesized that large natural nuclear reactors ran on Mars but the xenon isotopic spectrum and lack of craters shows the explosions are anomalous.

Brandenburg J. E. **POSTER LOCATION #264**  
[\*The NMS \(New Mars Synthesis\), Recent Data from Gale Crater and NWA 7034: Evidence for a Persistent Biologically Stabilized Greenhouse on Mars\*](#) [#2799]

Existence of aqueous, highly oxidized, carbonate-poor sediments in a Hesperian-aged formation constitutes evidence for a persistent bio-greenhouse on Mars.

Izawa M. R. M. Tait K. T. Moser D. E. Barker I. R. Hyde B. C. et al. **POSTER LOCATION #265**  
[\*Mineralogy, Petrology and Geochronology of Intermediate Shergottite NWA 7042\*](#) [#2523]

Mineralogical and geochronological study of shergottite NWA 7042 reveals datable mineral assemblages related to igneous crystallization and shock ejection.

Potter S. A. Brandon A. D. Peslier A. H. **POSTER LOCATION #266**  
[\*Melt Inclusion Analysis of RBT 04262 with Relationship to Shergottites and Mars Surface Compositions\*](#) [#2945]

Melt inclusion compositions of RBT 04262 and other shergottites are compared to martian surface compositions to elucidate variety and processes of martian basalts.

He Q. Xiao L. **POSTER LOCATION #267**  
[\*Mineralogy and Petrology of the Olivine-Phyric Shergottite Northwest Africa 4880\*](#) [#2562]

This abstract describes the mineralogy and petrology of the olivine-phyric shergottite NWA 4880, and found it shows much affinity to NWA 1068.

Sharp T. G. Walton E. L. Hu J. **POSTER LOCATION #268**  
[\*Shock Effects in NWA 8159: Evidence for a Modest Shock Pressure and a Large Impacting Body\*](#) [#1939]

We determined the high-pressure phases associated with the shock veins in NWA 8159 and used them to estimate the shock pressure and the duration.

Ross D. K. Rao M. N. Nyquist L. E. Shih C.-Y. Sutton S. et al. **POSTER LOCATION #269**  
[\*Gusev-Meridiani-Type Soil Component Dissolved in Some Shock Glasses in Shergottites\*](#) [#2032]

Using mass balance modeling, we show that some shock glasses in shergottites contain a Gusev-Meridiani-like soil component.

Ma C. Tschauer O. Beckett J. R. Rossman G. R. **POSTER LOCATION #270**  
[\*Liebermannite: A New Potassic Hollandite \(KAlSi<sub>3</sub>O<sub>8</sub>\) from the Zagami Basaltic Shergottite\*](#) [#1401]

Liebermannite, a new high-pressure mineral from Mars, likely crystallized during a shock event from high-K mesostasis composition melts in Zagami basalt.

Kuchka C. R. Herd C. D. K. Walton E. L. Chen Y. Liu Y. **POSTER LOCATION #271**  
[\*A Geochemical Signature for Martian Near-Surface Alteration in the Tissint Meteorite: Evidence from the Volatile Inventory in Shock Melt Glass\*](#) [#2441]

SIMS analyses of volatiles in Tissint glass provide evidence that a geochemical signature for martian alteration products is preserved in shock melt pockets.

Basu Sarbadhikari A. **POSTER LOCATION #272**  
[\*Petrographical and Mineralogical Diversity Between Fresh and Impact-Melted Domains of Olivine-Phyric Shergottite Tissint\*](#) [#1456]

Tissint represents partially remelted and subsequently recrystallized basaltic material of impact source regions of the shergottites from Mars.

Buz J. Kirschvink J. L. **POSTER LOCATION #273**  
[\*Visualizing the Magnetization and Fracture Surfaces in ALH 84001 Using SQUID Microscopy\*](#) [#2961]

We use ultra-high-resolution scanning SQUID microscopy to construct a 3-D model of the magnetization and fracture surfaces in ALH 84001.

Hamilton V. E. Filiberto J.

**POSTER LOCATION #274**

[Crystallinity and Preferred Orientation of Phases in Gabbroic Shergottite NWA 6963](#) [#2712]

Little sample says/Shock makes minerals glassy/Texture is preserved.

Burger P. V. Papike J. J. Bell A. S. Shearer C. K.

**POSTER LOCATION #275**

[Vanadium Valence in Spinel from a Y98 Composition Melt as Determined by X-Ray Absorption Near Edge Structure \(XANES\)](#) [#2743]

We examine spinels of Y98 composition using X-ray Absorption Near Edge Structure (XANES) to determine the valence ratio of  $V^{3+}/V^{4+}$ .

Tucker K. Hervig R. Wadhwa M.

**POSTER LOCATION #276**

[Hydrogen Isotope Systematics of Nominally Anhydrous Phases in Martian Meteorites](#) [#2915]

This study suggests that terrestrial-like hydrogen isotopic compositions of NAPs in martian meteorites could reflect the actual D/H ratio of the martian mantle.

Williams J. T. Sharp Z. D. Shearer C. K. Agee C. B.

**POSTER LOCATION #277**

[Confirmation of an Isotopically Light Chlorine Solar Nebula and Use of Chlorine Isotopes as a Sensitive Recorder of Martian Crustal Contamination](#) [#2641]

This study presents new chlorine isotope data for the primitive solar nebula and the confirmation of two martian isotopic chlorine reservoirs (crust and mantle).

Mahajan R. R.

**POSTER LOCATION #278**

[Martian Rocks that Reached to Earth were Ejected in 10 Possible Ejection Events](#) [#1166]

Ejection events of rocks from Mars is studied using cosmic ray exposure ages, based on noble gases. A possible 10 ejection events from Mars are suggested.