

Tuesday, March 22, 2016

[T331]

## POSTER SESSION I: GEOCHEMISTRY AND PETROLOGY OF MARS

6:00 p.m. Town Center Exhibit Area

Beatty D. W. McSween H. Y. Goreva Y. S. Hausrath E. Herd C. D. K. et al. **POSTER LOCATION #463**  
[Recommended Maximum Temperature for Mars Returned Samples](#) [#2662]

This abstract describes scientific constraints for the maximum temperature of the samples to be collected by the Mars 2020 sample-collecting rover.

Cassata W. S.

**POSTER LOCATION #464**

[<sup>40</sup>Ar/<sup>39</sup>Ar Systematics and Noble Gas Components in the Early Amazonian Martian Meteorite Northwest Africa 8159](#) [#2118]

Ar-Ar data confirm an early Amazonian age for NWA 8159. Martian atmospheric Xe, either from the early Amazonian or a later shock event, is present in NWA 8159.

Park J. Nyquist L. E. Herzog G. F. Turrin B. D. Lindsay F. N. et al.

**POSTER LOCATION #465**

[<sup>40</sup>Ar/<sup>39</sup>Ar Ages of Nakhilites Miller Range \(MIL\) 090030, 090032 and 090136](#) [#1821]

We report the first Ar/Ar ages of the paired nakhilites MIL 090030, 090032 and 090136. We report crystallization ages of ~1.4 Ga and aqueous alteration of ~0.7 Ga.

Irving A. J. Andreasen R. Righter M. Lapen T. J. Busemann H. et al.

**POSTER LOCATION #466**

[Northwest Africa 4480 Revisited: Petrologic, Isotopic, and Noble Gas Studies of an Unshocked, Maskelynite-Free Mafic Shergottite with a Long Cosmic Ray Exposure Age](#) [#2330]

Shockingly unshocked, from a unique depleted martian mantle reservoir and launched ~16 million years ago. New isotopic data for intermediate shergottites too.

Combs L. M. Udry A. Day J. M. D.

**POSTER LOCATION #467**

[Petrography and Mineral Chemistry of the New Enriched Lherzolitic Shergottite Northwest Africa 10169](#) [#2804]

NWA 10169 is a new lherzolitic shergottite with a bulk REE profile and mineral composition that closely resemble the enriched lherzolitic shergottites.

Provencio P. Shearer C. K. Bell A. S. Burger P. V.

**POSTER LOCATION #468**

[Nano-Scale Investigation of Spinel-Orthopyroxene Intergrowths in Northwest Africa 8159. A Record of fO<sub>2</sub> But at What Temperature?](#) [#2411]

We examine magnetite-orthopyroxene intergrowths in NWA 8159 to determine whether they are magmatic or subsolidus in origin.

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

**POSTER LOCATION #469**

[Igneous Spinel Chemistry as a Function of Temperature and Oxygen Fugacity in Martian Melts](#) [#1769]

We examine how the chemistry of igneous spinels, crystallized from a Yamato 980459 (Y98)-composition melt, reflect their formation conditions.

Sutton S. R. Rao M. N. Nyquist L. E. Ross D. K.

**POSTER LOCATION #470**

[Vanadium K XANES Studies of Elephant Moraine A79001 Impact-Melt Glasses Revisited](#) [#2195]

Vanadium K XANES of EETA79001 impact glasses shows V<sup>3+</sup> with possible V<sup>2+</sup> in Lith. A and V<sup>3+</sup>, V<sup>4+</sup> in Lith. B, demonstrating the heterogeneity of shock reduction.

Basu Sarbadhikari A. Babu E. V. S. K. Vijaya Kumar T.

**POSTER LOCATION #471**

[Olivine-Hosted Melt-Inclusions in Martian Meteorite Tissint](#) [#1836]

Martian meteorite Tissint underwent a unique petrogenesis through martian mantle and crust, recorded by different generations of olivine-hosted melt inclusions.

Castle N. Herd C. D. K. **POSTER LOCATION #472**  
[Trace Elements in Martian Meteorites and the Olivine Peritectic Reaction: Insights from Tissint Experimental Petrology](#) [#2467]

Results of experimental investigation of Tissint, specifically the role of oxidation during crystallization; application to shergottites and martian volcanism.

Collinet M. Grove T. L. **POSTER LOCATION #473**  
[Melting Conditions of Alkali- and Phosphorus-Rich Primary Magmas from the Martian Mantle](#) [#2837]

Low-degree experimental melts constrain the incongruent melting reactions of the martian mantle and the effect of variable amounts of phosphorus.

Shearer C. K. Bell A. S. Burger P. V. Papike J. J. Jones J. et al. **POSTER LOCATION #474**  
[The Mineralogy, Geochemistry, and Redox State of Multivalent Cations During the Crystallization of Primitive Shergottitic Liquids at Various  \$fO\_2\$ . Insights into the  \$fO\_2\$  of the Martian Mantle and Crustal Influences on Redox Conditions of Martian Magmas](#) [#1373]

This presentation explores the effect of  $fO_2$  on the liquid line of descent (LLD) for primitive shergottite liquid compositions.

Ferdous J. Brandon A. D. Peslier A. H. Pirotte Z. **POSTER LOCATION #475**  
[Basaltic Shergottite Northwest Africa 856: Differentiation of a Martian Magma](#) [#2126]

The crystallization history of an enriched basaltic shergottite, NWA 856, constrains differentiation processes in martian magmatic systems.

Peluso D. O. Balta J. B. **POSTER LOCATION #476**  
[Rare Earth Element Variations in Recharging Martian Magma Chambers: Impact on Shergottite Compositions](#) [#1789]

Rare earth element variations during resupply of active martian magma chambers.

Koike M. Takahata N. Sano Y. Nagaishi K. Ishikawa T. **POSTER LOCATION #477**  
[Lithium and Lead Isotopic Signatures of Martian Sub-Surface Components Recorded in Shergottites Phosphates](#) [#1843]

We present our preliminary in-situ  $\delta^{7}Li$  analyses of shergottites phosphates along with U-Pb data. These phosphates might provide martian crustal information.

Jacobs G. M. Anand M. Franchi I. A. Grady M. M. **POSTER LOCATION #478**  
[Investigating the History of Proto-Breccia Clasts in Martian Regolith Breccia Northwest Africa 7034](#) [#2787]

Proto-breccia clasts are identified and their histories evaluated using SEM and C-T data, in martian brecciated meteorite NWA 7034.

Santos A. R. Agee C. B. Humayun M. McCubbin F. M. Shearer C. K. **POSTER LOCATION #479**  
[Petrogenesis of Igneous-Textured Clasts in Martian Meteorite Northwest Africa 7034](#) [#2971]

New chemical data from igneous-textured clasts within NWA 7034 provides insight into their formation history and suggests they derive from separate sources.

McCubbin F. M. Barnes J. J. Santos A. R. Boyce J. W. Anand M. et al. **POSTER LOCATION #480**  
[Hydrogen Isotopic Composition of Apatite in Northwest Africa 7034: A Record of the "Intermediate" H-Isotopic Reservoir in the Martian Crust?](#) [#1326]

Reservoirs abound / Is hydrogen in the mix? / We may never know.

MacArthur J. L. Bridges J. C. Hicks L. J. Burgess R. Joy K. H. **POSTER LOCATION #481**  
[Water and the Formation of the Northwest Africa 8114 Martian Regolith](#) [#2916]

NWA 8114 pyroxene recrystallised and oxidised to magnetite and amorphous silicate, with later low-T goethite formation, shown by TEM and synchrotron FTIR, XRD.

Peslier A. H. Cintala M. J. Montes R. Cardenas F. **POSTER LOCATION #482**  
[FTIR Analysis of Water in Pyroxene and Plagioclase in Allan Hills 84001 and Nakhilites](#) [#1173]  
 Degassing and shock control the water content of pyroxene and plagioclase/maskelynite in ALH 84001 and nakhilites.

Martin A. M. Médard E. Lanzirotti T. **POSTER LOCATION #483**  
[3D-Mapping of Fayalite Oxidation Using Synchrotron: Implications for Volatiles Evolution During Planetary Crust Formation](#) [#3059]  
 We present Fe redox maps of oxidized fayalite crystals oriented in three crystallographic directions, and constrain the evolution and role of volatiles.

Takenouchi A. Mikouchi T. **POSTER LOCATION #484**  
[Iron Micro-XANES Analysis of Colored Olivine in Martian Meteorites](#) [#1755]  
 We analyzed various colored olivine in ten martian meteorites by SR-XANES and considered their formation processes combining previous SEM observation results.

McKeeby B. E. Mahmood S. Lowe M. Greenwood J. P. **POSTER LOCATION #485**  
[An Investigation of Jarosite and Associated Alteration Mineralogy in Martian Meteorite Roberts Massif 04262 Using Micro-Raman Spectroscopy](#) [#1311]  
 Martian thin section RBT 04262,30 was studied using a micro-Raman spectroscopy, SEM BSE and EDS. Jarosite was imaged as vein fill crosscutting sulfate grains.

Vaci Z. Newsom H. E. Agee C. B. Brearley A. J. Tschauner O. et al. **POSTER LOCATION #486**  
[Electron Probe Microanalysis, Micro X-Ray Diffraction, and Deuterium-Hydrogen Analysis of Hydrous Alteration in Martian Meteorites Northwest Africa 10416 and 8159](#) [#2538]  
 Altered olivine grains in NWA 8159 and 10416 were analyzed by electron microprobe. NWA 10416 was further analyzed by micro-XRD and D/H mass spectrometry.

Usui T. Alexander C. M. O'D. Wang J. Simon J. I. Jones J. H. **POSTER LOCATION #487**  
[Coordinated In Situ NanoSIMS Analyses of H-C-O Isotopes in Allan Hills 84001 Carbonates](#) [#1780]  
 This study provides a new estimate on the hydrogen isotopic composition ( $D/H = \sim 1.5\text{-}2 \times \text{SMOW}$ ) of the Noachian surface water.

Izawa M. R. M. Schmidt M. E. Berger J. A. Gellert R. **POSTER LOCATION #488**  
[Evaluating the Influence of Magmatic Sulphides on Chalcophile Element Enrichments in the Bradbury Assemblage, Gale Crater, Mars, Using APXS Measurements](#) [#2705]  
 Chalcophile element enrichments in Gale crater measured by APXS may be influenced by magmatic sulphides.

Adcock C. T. Tschauner O. Hausrath E. M. **POSTER LOCATION #489**  
[An Investigation of Shock Effects on Mars-Relevant Phosphate Minerals: Shock-Transformation of Chlorapatite](#) [#1577]  
 Results and implications of shock-recovery experiments and synchrotron studies on Mars-relevant phosphate minerals.

Walton E. L. Tschauner O. Herd C. D. K. Agee C. B. **POSTER LOCATION #490**  
[Shock Effects in New Martian Olivine Basalt Northwest Africa 10416: Distinct from Shergottites but Akin to Northwest Africa 8159](#) [#1639]  
 Shock effects in new martian basalt NWA 10416 are described which imply a relatively low shock pressure but longer shock duration compared to shergottites.

Hu J. Sharp T. G.

**POSTER LOCATION #491**

[Shocked Feldspar in Martian Meteorites: Evidence Against Pervasive Melting and Resetting](#) [#2542]

We investigate the textures of shock-induced feldspar glass in martian meteorites and suggest the amorphization occurs mostly under moderate to low temperature.

Kaiden H. Misawa K. Niihara T.

**POSTER LOCATION #492**

[Model for the Shock-Resetting Conditions of Uranium-Lead Systematics of Baddeleyite: Implications for Martian Meteorite Chronology](#) [#3019]

We evaluated the conditions of shock-resetting of U–Pb isotopic systematics in baddeleyite and conclude that U–Pb isotopic systematics was not disturbed.