

Thursday, March 22, 2018 [R634]
POSTER SESSION II: MARTIAN GEOCHEMISTRY, PETROLOGY, AND CHRONOLOGY II
 6:00 p.m. Town Center Exhibit Area

van Westrenen W. Steenstra E. S. **POSTER LOCATION #533**
[*Geochemical Constraints on the Composition of the Martian Core*](#) [#1025]

The predicted metal-silicate partitioning behaviour of S combined with plausible bulk Mars compositions suggests the Martian core must be S-rich (>10 wt.% S).

Irving A. J. Kuehner S. M. Carpenter P. K. Moser D. E. Barker I. et al. **POSTER LOCATION #534**
[*Petrologic, Isotopic, and Elemental Characterization of Shock-Melted Intermediate Olivine Gabbroic Shergottite Northwest Africa 11509*](#) [#2279]

A unique intermediate permafic non-poikilitic gabbroic shergottite with distinctive shock-melting features was derived from a unique martian mantle source.

Nyquist L. E. Shih C.-Y. Park J. Herzog G. F. Nagao K. et al. **POSTER LOCATION #535**
[*Radiogenic and Cosmogenic Isotopes in Los Angeles and Dhofar 378 Shergottites*](#) [#1622]

Isotopes extend the similarity between Dhofar 378 and LA, but cannot verify that the rocks were ejected from Mars together.

Righter M. Lapen T. J. Irving A. J. **POSTER LOCATION #536**
[*Extending the Range in Ages and Source Compositions of Shergottites: Lu-Hf and Sm-Nd Age and Isotope Systematics of Northwest Africa 4480*](#) [#2609]

NWA 4480, a unique shergottite with isotope signature, falls in between intermediate and depleted shergottites. We present Lu-Hf and Sm-Nd isotopic results.

Turrin B. D. Setera J. B. Park J. Delaney J. S. Swisher C. C. III et al. **POSTER LOCATION #537**
[*⁴⁰Ar/³⁹Ar Ages of Plagioclase-Bearing Shergottite Northwest Africa 4480*](#) [#2814]

Argon ages from NWA4480, a minimally shocked shergottite with birefringent plagioclase, indicates a 700 ± 140 Ma age and non-Martian atmospheric Ar contamination.

Cohen B. E. Smith C. L. Lee M. R. Mark D. F. Almeida N. et al. **POSTER LOCATION #538**
[*Northwest Africa 11522: A New Paired Stone of Martian Polymict Regolith Breccia Northwest Africa 7034*](#) [#1900]

We report X-ray micro-CT, SEM, and electron microprobe results from NWA 11522, a newly classified pair of NWA 7034 polymict breccia.

Filiberto J. Gross J. Udry A. Trela J. Wittmann A. et al. **POSTER LOCATION #539**
[*Shergottite Northwest Africa \(NWA\) 6963 a Pyroxene-Cumulate Martian Gabbro: Constraints on the Mineralogy, Petrology, and Physical Properties of the Martian Crust at Depth*](#) [#2107]

Pyroxenes whisper / Born deep, trapped inside, and froze. / Martian volcano.

Combs L. M. Udry A. Howarth G. H. Lapen T. J. Righter M. et al. **POSTER LOCATION #540**
[*Petrology and Geochemistry of the Enriched Poikilitic Shergottite Northwest Africa 10169: Insight into the Martian Interior*](#) [#1727]

Northwest Africa 10169 is a geochemically enriched poikilitic shergottite that underwent polybaric crystallization, and crystallized 167 ± 31 million years ago.

Rahib R. R. Udry A. Combs L. C. Howarth G. H. **POSTER LOCATION #541**
[*Formation and Emplacement Processes of Martian Poikilitic Shergottite Meteorites*](#) [#1303]

This study focuses on quantitative textural analyses of eight poikilitic shergottites, a relatively rare and understudied subgroup of martian meteorites.

- Stephen N. R. **POSTER LOCATION #542**
[Linking Martian Breccias Northwest Africa 11220 and Northwest Africa 7034 to the Martian Meteorite Family: Revisiting the Martian Nomenclature](#) [#1460]
 New Mars breccias / Many clasts and chemistries / Are names suitable?
- Udry A. Day J. M. D. **POSTER LOCATION #543**
[Formation and Emplacement of the Cogenetic Nakhlite and Chassignite Meteorites](#) [#1052]
 Nakhlite and chassignite meteorites formed from the same source but were emplaced as several lava flows or sills and involved open-system processes.
- Semprich J. Schwenzer S. P. Treiman A. H. **POSTER LOCATION #544**
[Phase Equilibria Modeling of Low-Grade Metamorphic Martian Rocks](#) [#1459]
 Low-grade metamorphic phase diagrams are modeled for representative martian rock compositions with the aim to explain alteration products identified on Mars.
- Yang S. Humayun M. Righter K. Peslier H. **POSTER LOCATION #545**
[The Contrast in Outgassing of Germanium Between Shergottites and Nakhrites](#) [#1681]
 Comparative study of Ge of shergottites against nakhrites and chassignites indicates volatile loss of Ge from shergottite magmas due to volcanic outgassing.
- Franz H. B. Wu N. Farquhar J. Irving A. J. **POSTER LOCATION #546**
[Sulfur Isotopic Analysis of Sulfides from 20 Shergottites](#) [#2996]
 We present data for the sulfur isotopic composition of 20 newly recovered shergottites.
- Lapen T. J. Righter M. Gao Y. Irving A. J. **POSTER LOCATION #547**
[Representative Bulk Elemental Compositions for a Suite of Shergottites](#) [#2773]
 We report whole rock major and trace element compositions for 13 shergottites from Northwest Africa.
- Ustunisik G. DiFrancesco N. Yang S. Humayun M. Rogaski A. **POSTER LOCATION #548**
[Role of Cl and S on the Volatility of Ge, Zn, and Li in Martian Basaltic Magmas: Implications for Volatile Contribution to Martian Surface Lithologies](#) [#2659]
 Ge volatilizes with or without Cl / Li stays in the melt / Zn volatility increases by Cl.
- Niihara T. Misawa K. **POSTER LOCATION #549**
[Occurrence of Phosphate Minerals in Dark Mottled Lithology of Zagami](#) [#2652]
 We report petrographic signature of phosphate minerals in DML of Zagami.
- McCubbin F. M. Barnes J. J. Vander Kaaden K. E. Srinivasan P. Whitson E. S. et al. **POSTER LOCATION #550**
[Experimental Study into the Stability of Whitlockite and Hydroxylapatite in Basaltic Magmas](#) [#2185]
 Merrillite has H? / With hydroxylapatite? / Stable in a melt?
- O'Brien A. C. Hallis L. Steele A. Lee M. R. **POSTER LOCATION #551**
[Reduced Macromolecular Carbon and Elemental Sulfur in Northwest Africa 8159: Implications for Oxygen Fugacity of the Martian Mantle](#) [#2119]
 We found reduced macromolecular carbon and elemental sulfur in magmatic minerals in the martian meteorite NWA 8159, implying a reduced martian mantle source.
- Davis D. M. Nielsen S. G. Magna T. Mezger K. **POSTER LOCATION #552**
[Constraints on the Vanadium Isotope Composition of Mars](#) [#1696]
 We are presenting V isotope data from 25 martian meteorites in order to constrain the V isotope composition of bulk silicate Mars.

Burney D. Neal C. R. Day J. M.D.

POSTER LOCATION #553

[Moderately Volatile Elements \(MVEs\) in the Martian and Lunar Mantles](#) [#1630]

Moderately volatile elements in martian meteorites show that Mars is not uniformly enriched in the MVEs. There are depleted reservoirs as well.

Ferdous J. Brandon A. D. Peslier A. H.

POSTER LOCATION #554

[Magma Evolution of Poikilitic Shergottite Northwest Africa 7397 from Its Olivine-Hosted Melt Inclusions](#) [#1033]

Olivine-hosted melt inclusion compositions of NWA 7397 are compared with other shergottites' compositions to explore the processes of shergottite magma evolution.

Schröder C. Ashley J. W. Tait A. W. Velbel M. A. Boston P. J. et al.

POSTER LOCATION #555

[Meteorites on Mars Can Help to Decipher the Red Planet — Should They Be Considered as Samples of Opportunity for Mars Sample Return?](#) [#1910]

We summarize insights about Mars from investigating meteorites found on Mars and discuss whether such meteorites could be considered for Mars Sample Return.

Jenkins L. E. Flemming R. L. McCausland P. J. A.

POSTER LOCATION #556

[Quantitative In Situ XRD Measurement of Shock Metamorphism in Martian Meteorites: Olivine Lattice Strain and Strain-Related Mosaicity](#) [#2472]

Two methods for evaluating shock metamorphism using XRD data from olivine were applied to martian meteorites to determine shock stage and peak shock pressure.

Takenouchi A. Mikouchi T.

POSTER LOCATION #557

[Local Olivine Darkening by the Formation of Iron Nanoparticles in Shergottite Olivines](#) [#1762]

We found locally darkened olivine in shergottites around shock melt pockets was induced by Fe nanoparticles via back-transformation of high-pressure phases.

Torre-Fdez I. Ruiz-Galende P. Madariaga J. M. Aramendia J.

POSTER LOCATION #558

Gómez-Nubla L. et al.

[In-Depth Study of the Calcite Present in the Martian Nakhlite NorthWest Africa 6148 Meteorite](#) [#2160]

Shocked calcite, as calcite II and/or III, has been detected by Raman Spectroscopy in inclusions of the NWA 6148 Nakhlite, together with non-shocked calcite.

Shidare M. Nakada R. Usui T. Tobita M. Yokoyama T.

POSTER LOCATION #559

[Sulfur K-Edge XANES Analyses of Shergottites: Implication for Aqueous Alteration Processes on Mars](#) [#1864]

Our systematic XANES analyses indicate the existence of sulfate as a minor precursor phase of impact glasses and post-magmatic water-rock interaction.