

Thursday, March 21, 2013

[R724]

**POSTER SESSION: MARS PETROLOGY:
EXPERIMENTS, SAMPLES, AND REMOTE SENSING
6:00 p.m. Town Center Exhibit Area**

Rao M. N. Ross D. K. See T. H. Nyquist L. E. Sutton S. et al. **POSTER LOCATION #385**
[Shock Experiments on Basalt-Ferric Sulfate Mixes at 21 GPa and 49 GPa and Their Relevance to Martian Meteorite Impact Glasses](#) [#2627]

We conducted laboratory shock experiments at 21 and 49 GPa on Columbia River Basalts, and the ferric sulfate mix reveals that ferric sulfate is reduced to iron sulfide.

Usui T. Rapp J. F. Draper D. S. **POSTER LOCATION #386**
[Search for a High-Pressure Multiple-Saturation Point for a Martian Primitive Basalt](#) [#2877]

We report high-pressure near-liquidus phase relations of synthetic Yamato 980459 to constrain possible origins of near-primary martian magmas.

Rapp J. F. Draper D. S. Mercer C. M. **POSTER LOCATION #387**
[Anhydrous Liquid Line of Descent of Yamato 980459 and Evolution of Martian Parental Magmas](#) [#1688]

We present new experimental data on the evolution of a Y98-like parental melt, and the implications for basaltic magma genesis on Mars.

Anderson J. K. Buhr S. J. Colson R. O. Anderson L. K. Young E. D. et al. **POSTER LOCATION #388**
[Importance of Considering Melt Activity Coefficients and Charge-Balancing Substitution Mechanisms when Understanding Partitioning in Olivine](#) [#1555]

New olivine-melt partitioning experiments yield insights into melt activities and charge-balancing substitution mechanisms.

Armstrong L. S. Hirschmann M. M. **POSTER LOCATION #389**
[Solubility of C-O-H Volatiles in Water-Poor Martian Basalt: The Effect of \$f_{CO}\$ Variation](#) [#3046]

We present preliminary experimental determinations reduced C-O-H volatile solubility in basaltic magmas as a function of water content, f_{O_2} , and f_{CO} .

McCubbin F. M. Vander Kaaden K. E. Whitson E. S. Bell A. S. Shearer C. K. **POSTER LOCATION #390**
[Partitioning of F and Cl Between Apatite and a Synthetic Shergottite Liquid \(QUE 94201\) at 1 and 4 GPa from 950 to 1450 °C](#) [#2748]

Experiments on the partitioning of F and Cl between apatite and an analog martian silicate melt show a strong temperature dependence on exchange coefficients.

Bell A. S. Burger P. V. Le L. Papike J. J. Jones J. H. et al. **POSTER LOCATION #391**
[The Effects of Oxygen Fugacity on the Crystallization Sequence and Cr Partitioning of an Analog Y-98 Liquid](#) [#1599]

Experiments conducted in this study aim to elucidate the role of temperature and f_{O_2} on trace-element partitioning in an analog Y-98 composition.

Papike J. J. Le L. Burger P. V. Shearer C. K. Bell A. S. et al. **POSTER LOCATION #392**
[A new Spinel-Olivine Oxybarometer: Near-Liquidus Partitioning of V Between Olivine-Melt, Spinel-Melt, and Spinel-Olivine in Martian Basalt Composition Y980459 as a Function of Oxygen Fugacity](#) [#1087]

We introduce a new, potentially powerful oxybarometer, V partitioning between spinel and olivine, which can be used when no melt is preserved in the meteorite.

Ding S. D. Dasgupta R. D. **POSTER LOCATION #393**
[Sulfur Concentration of Martian Magmas at Sulfide Saturation at High Pressures and Temperatures — Implications for Deep Sulfur Cycle on Mars](#) [#1713]

To constrain sulfur cycle of Mars, melt-sulfide equilibria were simulated to obtain sulfur content of martian magmas at sulfide saturation at 1–3 GPa.

Collinet M. Médard E. Vander Auwera J. Charlier B. **POSTER LOCATION #394**
[Melting of a Primitive Martian Mantle at 1–2 GPa: Experimental Constraints on the Origin of Basalts on Mars](#) [#2542]

Experiments provide potential melt compositions that are compared to meteorites and surface lavas to discuss the diversity of basaltic magmatism on Mars.

Mookherjee M. **POSTER LOCATION #395**
[High Pressure Behavior of Iron Alloys: Insights into Planetary Cores](#) [#1820]

We will report new results on energetics, equation of state, and elasticity of iron alloys at conditions relevant to planetary cores.

Udry A. Balta J. B. McSween H. Y. Jr. **POSTER LOCATION #396**
[Polybaric Crystallization of Gusev Alkaline Basalts](#) [#1265]

We constrained the formation of alkaline magma on Mars by polybaric fractional crystallization from primary magma using Gusev alkaline basalt compositions.

Udry A. Balta J. B. McSween H. Y. **POSTER LOCATION #397**
[CSD Measurements on Olivine Grains in the Tissint Meteorite](#) [#1266]

We used crystal size distribution analysis on the shergottite Tissint to better understand and compare its growth history to other olivine-phyric shergottites.

Shah D. Brachfeld S. First E. Hammer J. **POSTER LOCATION #398**
[Rock-Magnetics and Remanence Properties of Yamato 980459 \(Y-980459\)](#) [#2307]

This study examines magnetic recording assemblages and remanence properties of the SNC martian meteorite Y-980459, a primitive member of the shergottite group.

Yang S. Y. Humayun M. Jefferson G. Fields D. Righter K. et al. **POSTER LOCATION #399**
[Chemical Composition of Four Shergottites from Northwest Africa \(NWA 2800, NWA 5214, NWA 5990, NWA 6342\)](#) [#1738]

Laser ablation ICP-MS was used to obtain a complete dataset for the abundances of 71 elements in the 11 martian meteorites.

Nyquist L. E. Shih C-Y. **POSTER LOCATION #400**
[Peering Through a Martian Veil: ALHA 84001 Sm-Nd Age Revisited](#) [#2182]

¹⁴⁷Sm-¹⁴³Nd data (n = 22) and ¹⁴⁶Sm-¹⁴²Nd data (n = 16) give the igneous crystallization age of ALH84001 as >4.4 Ga. REE abundances in the parent magma are modeled.

Filiberto J. Gross J. Trela J. Ferré E. C. **POSTER LOCATION #401**
[Constraints on Fabric-Forming Mechanisms in Shergottite NWA 6963: Results from Mineralogy and Shape-Preferred Orientation](#) [#2124]

We combine 2-D shape-preferred orientation and mineral chemistry of NWA 6963 to constrain the processes that formed magmatic fabrics on Mars.

Dottin J. W. III Greenwood J. P. **POSTER LOCATION #402**
[Can Merrillite Provide Information on Water in Martian Meteorites? Preliminary Results from Los Angeles and QUE 94201](#) [#2578]

The development of methodology for water and D/H ion microprobe analysis of merrillite.

Santos A. R. Agee C. B. McCubbin F. M. Shearer C. K. Sharp Z. D. et al. **POSTER LOCATION #403**
[Apatite and Merrillite from Martian Meteorite NWA 7034](#) [#2601]

Phosphate minerals from different textural regimes were contrasted to provide new insight into melt volatiles and fluids in martian meteorite NWA 7034.

Kuchka C. R. Walton E. L. Herd C. D. K.

POSTER LOCATION #404

[Shock Melt Features in Los Angeles and Tissint: A Comparison](#) [#3043]

Shock metamorphic mineralogy and melt features of the highly differentiated Los Angeles and the more primitive olivine-phyric Tissint meteorites are compared.

Ross D. K. Rao M. N. Nyquist L. Agee C. B. Sutton S.

POSTER LOCATION #405

[Compositions of Magmatic and Impact Melt Sulfides in Tissint and EETA79001: Precursors of Immiscible Sulfide Melt Blebs in Shergottite Impact Melts](#) [#1715]

Compositions of sulfide impact melt blebs in Tissint and EET A79001 suggest that they have various precursors, and are not derived solely by melting pyrrhotite.

Summerson I. Greshake A. Fritz J. Reimold W. U.

POSTER LOCATION #407

[High-Pressure Phases in a Melt Pocket Within an Olivine Macrocryst in the Tissint Martian Meteorite](#) [#1974]

High-pressure phases of olivine and chromite were identified in a melt pocket within an olivine macrocryst in the Tissint martian meteorite.

Sonzogni Y. Treiman A. H.

POSTER LOCATION #408

[Small Melt Inclusions in Olivines from Martian Meteorites: Value for Constraining Original Melt Compositions](#) [#1049]

In olivine crystals of the Tissint shergottite, small glassy melt inclusions and large partly crystalline melt inclusions have the same bulk compositions.

Stephen N. R. Genge M. J. Russell S. S. Schofield P. F.

POSTER LOCATION #409

[Turning Tissint Inside Out; Searching for its Launch Pair\(s\) from Mars](#) [#2131]

"Mars meteorite, is paired with others they say, but not so sure now..." We present various new data implicating a possibly different source region for Tissint.

Hu J. Sharp T. G. Walton E. L.

POSTER LOCATION #410

[Shock Effects in Tissint II: Olivine Transformation to Silicate Perovskite and Oxide](#) [#1041]

This study presents olivine dissociation to Mg-perovskite plus oxide in Tissint, suggesting a very high shock pressure and distinct impact condition on Mars.

Walton E. L. Sharp T. G. Hu J. Filiberto J.

POSTER LOCATION #411

[Shock Metamorphism of the Tissint Martian Meteorite I: Constraints on Shock Conditions and Post-Shock Thermal History](#) [#1039]

Shock in martian meteorite Tissint has been characterized by Raman, TEM, and XRD. Minerals preserved in and around shock veins vary depending on vein thickness.

Lindsay F. N. Osmond J. Delaney J. S. Herzog G. F. Turrin B. et al.

POSTER LOCATION #412

[Ar/Ar Systematics of Martian Meteorite NWA 2975](#) [#2911]

Ar-Ar data for single grains from basaltic shergottite NWA 2975 yield an age of 300 Ma with no evidence of a trapped ^{40}Ar component that correlates with ^{36}Ar .

Varela M. E. Zinner E.

POSTER LOCATION #413

[Glass-Bearing Inclusions in Shergotty](#) [#1501]

We report results on major- and trace-element compositions of glass inclusions in Shergotty.

Mikouchi T. Takenouchi A. Inoue S. Kogure T. Kurihara T.

POSTER LOCATION #414

[Iron Nano-Particles in Olivine from the NWA 1950 Shergottite: Additional Complexity](#) [#1098]

Our TEM analysis on NWA 1950 olivine showed coexisting nanoparticles of Fe metal and oxide, suggesting the phase change upon cooling after shock.

Liu Y. Taylor L. A. Baziotis I. P. McSeen H. Y. Jr Bodnar R. J. et al. **POSTER LOCATION #415**
[Impact Excavation of Martian Meteorites: Index from Shock Formed Minerals](#) [#1371]

Discovery of additional large high-P minerals in olivine-phyric shergottites, the implication of impact launch and effect on radiometric ages of the samples.

Poulet F. Carter J. **POSTER LOCATION #416**
[Identification of a New Rock Type on Mars: Anorthosite](#) [#1451]

Report of anorthosite rocks on Mars.

Nazarian A. H. Rogers A. D. **POSTER LOCATION #417**
[Thermal Infrared Spectral Characterization of the Gorgonum-Atlantis Subregion of Mars' Eridania Basin](#) [#2628]

Study of a portion of the Eridania Basin using Thermal Emission Imaging System data to classify the spectral character and mineralogy of the region.

Gordon S. R. Newsom H. E. McCubbin F. M. Agee C. B. Shearer C. K. **POSTER LOCATION #418**
[Compositional Similarities Among Martian Meteorites, Regional Gamma Ray Data, and In Situ Lander Measurements: Implications for Igneous Processes](#) [#2472]

We compare GRS, in situ, and martian meteorite data to place the meteorites in a global/regional context and shed light on past igneous processes on Mars.

Jacob S. R. Hammer J. E. Welsch B. **POSTER LOCATION #419**
[Interpreting Magmatic Processes from Clinopyroxene in Terrestrial Ankarinite Lavas: A Procedural Blueprint for the Nakhilites?](#) [#3084]

We looked at clinopyroxene crystals from a Maui ankarinite lava flow as a possible analog to the martian nakhilites.

Rozel A. Clenet H. Douté S. Quantin C. **POSTER LOCATION #420**
[Hyperspectral Data Processing Using Neural Networks: Preliminary Results for Mafic Minerals in SNC's Meteorites](#) [#1469]

We use a neural network to detect and characterize mafic signatures on SNC meteorites, after a training on synthetic laboratory samples of similar composition.

Ody A. Poulet F. Bibring J.-P. Gondet B. Langevin Y. et al. **POSTER LOCATION #421**
[Search for Spectral Analogue Sites of Martian Meteorites Using NIR Data](#) [#2265]

We tried to identify possible source regions for martian meteorite by comparing their spectral properties with those of the martian surface using NIR OMEGA data.

Werner S. C. Melosh H. J. McSween H. Y. Liu Y. Baziotis I. P. et al. **POSTER LOCATION #422**
[Mojave Crater: Possible Source for Martian Meteorites](#) [#2257]

Mojave Crater, just a few million years old, could be the source crater for martian meteorites. This crater is significantly larger than sources previously suggested.

Price M. C. Parnell J. Wozniakiewicz P. J. Kearsley A. T. McMahon S. et al. **POSTER LOCATION #423**
[Gas Retention in Basaltic Rocks following Hypervelocity Impact: Implications for Methane on Mars](#) [#1935]

Possible sources of any methane on Mars include impact evolved methane from basalt. We present data showing that excess methane is NOT produced via this route.

Gou S. Di K. Yue Z. Wang J. **POSTER LOCATION #424**
[Reanalysis of MGS-TES Data with Detected/Known Minerals and its Implications for Geologic Evolution of Mars Crust](#) [#1255]

Unmixing results of MGS-TES by the use of detected or known minerals as priori knowledge show that the martian crust is subalkaline, with basaltic andesite dominant.

Skok J. R. Mustard J. F. Tornabene L. L. Karunatillake S. **POSTER LOCATION #425**
[Petrologic Implications of Martian Igneous Crustal Formation Based on Remote Observations](#) [#2253]

Remote observations of excavated ancient martian crust are used to examine the history of the planet's formation.

Bell J. F. III Lai J. C. Horgan B. Wellington D. F. **POSTER LOCATION #426**
[Characterizing the Bedrock Mineralogy of Dusty Regions of Mars Using Remote Sensing of Low Albedo “Windows” Through the Dust](#) [#2416]

We are using a variety of Mars orbital datasets to identify and characterize the mineralogy of small low-albedo “windows” in the planet’s dustiest regions.

Ody A. Poulet F. Bibring J.-P. Loizeau D. Langevin Y. et al. **POSTER LOCATION #427**
[What does Olivine tell us About Volcanic and Magmatic Martian Evolution?](#) [#2132]

Here we present constraints on the volcanic and magmatic evolution of Mars resulting from global and detailed investigations of olivine-bearing contexts.

Sinha R. K. Murty S. V. S. **POSTER LOCATION #428**
[Nature and Distribution of Olivine in Moreux Crater in Northern Mid-Latitude of Mars](#) [#1179]

A coordinated NIR/TIR spectral analysis of intercrater dunes within Moreux crater suggests that they are Mg-rich olivine with a composition ~ Fo₆₈₋₉₁.

Hanna R. D. Hamilton V. E. **POSTER LOCATION #429**
[Complications in Correlating Thermal Inertia and Olivine Abundance on Mars](#) [#2235]

We examine correlations between thermal inertia and olivine abundance on Mars and discuss how it can be complicated by local geology and scale of observation.

Morgan M. F. Murchie S. L. **POSTER LOCATION #430**
[Fresh Craters as Probes of Composition in Dust-Covered Regions Of Mars](#) [#2803]

We use MRO/CRISM observations of recent impacts in dust-covered regions of Mars to explore the surface composition hidden by dust.

Gross C. Sowe M. **POSTER LOCATION #431**
[Soffen Crater in the Terra Cimmeria Region of Mars](#) [#2470]

We search for several types of hydrated minerals in order to test the hypotheses of impact-induced hydrothermalism vs. excavation models.