

Thursday, March 20, 2014

[R709]

POSTER SESSION: MARS ALTERATION AND SPECTROSCOPY

6:00 p.m. Town Center Exhibit Area

Adams E. L. Lozano C. G. Duport L. G. Davila A. F. Fairen A. G. **POSTER LOCATION #167**
[Unraveling the History of Water on Mars Using Lithium Isotope Fractionation Models](#) [#2433]

We describe different case studies of Li-isotope fractionation in Mars that can be useful to determine the environmental conditions on the planet in the past.

Sexton M. R. Swindle A. L. Elwood Madden M. E.
 Hamilton V. E. Bickmore B. R. et al. **POSTER LOCATION #168**
[Conditions Favoring the Formation of Martian "Blueberries" by Freezing Aqueous Hematite Suspensions](#) [#1980]

Formation of Mars analog hematite spherules through freezing likely requires nanometric platy hematite and slow ice crystallization.

Friedlander L. R. Glotch T. D. **POSTER LOCATION #169**
[Phyllosilicate Spectra Identified at Mawrth Vallis by Factor Analysis and Target Transformation are Consistent with Impact-Related Spectral Change](#) [#2001]

We identify phyllosilicates at Mawrth Vallis using FATT and compare their VNIR reflectance spectra with spectra from nontronites after laboratory impacts.

Nickerson R. D. Chemtob S. M. Catalano J. G. **POSTER LOCATION #170**
[Phyllosilicate Formation and Trace Element Partitioning During Isochemical Hydrothermal Basalt Alteration](#) [#2686]

Isochemical hydrothermal alteration of a series of mafic rocks generates Fe-bearing trioctahedral phyllosilicates and differentially repartitions Mn and Zn.

Pan L. Ehlmann B. L. **POSTER LOCATION #171**
[Possible Formation Mechanisms of Phyllosilicates and Hydrated Silica in Acidalia Planitia](#) [#1245]

The formation mechanisms of hydrated minerals detected in Acidalia knobby terrains imply long-term erosional and depositional processes in aqueous environments.

Craig P. I. Ming D. W. Rampe E. B. **POSTER LOCATION #172**
[Sulfate Formation from Acid-Weathered Phyllosilicates: Implications for the Aqueous History of Mars](#) [#1970]

Sulfates formed from acid-weathered phyllosilicates may help explain the geologic relationship between phyllosilicates and sulfates observed on Mars.

Jain N. S. Bhattacharya S. Chauhan P. Ajai A. **POSTER LOCATION #173**
[Study of Phyllosilicates and Carbonates from the Capri Chasma Region of Valles Marineris on Mars Based on Mars Reconnaissance Orbiter-Compact Reconnaissance Imaging Spectrometer for Mars \(MRO-CRISM\) Observations](#) [#1821]

Aqueous minerals from Capri Chasma in Vallis Marineris on Mars give hints toward the study of the past environment history of Mars.

Yant M. H. Rogers A. D. Nekvasil H. Zhao Y.-Y. S. **POSTER LOCATION #174**
[Spectral Characterization of Acid Weathering on Martian Basaltic Glass and Rock](#) [#1229]

Geochemical experiments of synthetic martian rock linked with spectral and chemical analyses to understand basalt weathering and regolith development on Mars.

Smith R. J. Horgan B. Christensen P. R. Mann P. Cloutis E. A. **POSTER LOCATION #175**
[Acid Alteration of Basalts: Thermal-Infrared Spectra and Implications for High-Silica Phases on Mars](#) [#2273]

Here we present TIR spectral evidence that the high-silica component of TES surface type 2 could be explained by weathering rinds on basalt glass.

Cannon K. M. Mustard J. F. **POSTER LOCATION #176**
[*Oobleck and Order: The Amorphous History of Mars*](#) [#1962]

Mars rocks and soil contain significant amounts of amorphous material. We explore how that material formed and was accumulated throughout martian history.

Sun V. Z. Milliken R. E. **POSTER LOCATION #177**
[*Origin of Clay Minerals in Martian Central Peaks: Evidence for Post-Noachian Clay Formation*](#) [#1523]

We present evidence for post-Noachian (3.81–3.13 Ga) clay formation in crater central peaks, as well as clays that have been uplifted or have ambiguous origins.

Morris R. V. Ming D. W. Gellert R. Vaniman D. T. Bish D. L. et al. **POSTER LOCATION #178**
[*Chemical Composition of Crystalline, Smectite, and Amorphous Components for Rocknest Soil and John Klein and Cumberland Mudstone Drill Fines Using APXS, CheMin, and SAM Datasets from Gale Crater, Mars*](#) [#1319]

Martian global soil and mudstone drill fines analyzed by the MSL rover Curiosity all have about 50 wt.% XRD amorphous component.

Chemtob S. M. Nickerson R. D. Catalano J. G. **POSTER LOCATION #179**
[*Ferrous Iron Smectites and Their Oxidative Products: Implications for Clay Formation and Alteration on Mars*](#) [#1193]

Fe(II) smectites, structural analogs to the Sheepbed saponite, were synthesized and air-oxidized. Oxidative products were characterized by XRD, VNIR and XAFS.

Davis A. C. Bishop J. L. Veto M. Ruff S. Bristow T. et al. **POSTER LOCATION #180**
[*Comparing VNIR and TIR Spectra of Clay-Bearing Rocks*](#) [#2699]

Coordinated VNIR and TIR spectra were performed on clay-bearing rocks in order to compare these natural analogs with martian spectra from CRISM and TES.

Robertson K. M. Milliken R. E. **POSTER LOCATION #181**
[*Spectroscopic Laboratory Evidence for the Iron Reduction of Phyllosilicates Under Low Pressure Conditions*](#) [#1895]

We report on apparent iron reduction in sepiolite, nontronite, and montmorillonite under variable temperature and pressure conditions using VIS-NIR spectroscopy.

Michalski J. R. Cuadros J. Dekov V. Bishop J. L. Fiore S. et al. **POSTER LOCATION #182**
[*Constraints on the Crystal Chemistry of Fe-Mg Clays on Mars Based on Infrared Analyses of Fe-Rich Seafloor Clays*](#) [#1781]

Trends established in laboratory analyses of Fe-rich clays allow for precise interpretation of the crystal chemistry of martian clays from remote infrared data.

Stephen N. R. Schofield P. F. Berry A. J. Donaldson P. **POSTER LOCATION #183**
[*Mid-IR Mapping of Martian Meteorites; Spatially Resolved Mineral Spectra from a Synchrotron Source*](#) [#1378]

Using a synchrotron source for micro-FTIR analysis of meteorite thin sections provides improved precision for generation of martian-specific mineral spectra.

Gallegos Z. E. Newsom H. E. Ollila A. M. Lanza N. L. Wiens R. C. et al. **POSTER LOCATION #184**
[*Electron Microprobe Confirmation of ChemCam LIBS Analyses: Thin Sections from a Mars Analog Site*](#) [#2305]

ChemCam laser-induced breakdown spectroscopy analysis of thin sections from the Haughton impact structure, a Mars analog.

Rivera-Hernandez F. Bandfield J. L. Ruff S. W. Wolff M. J. **POSTER LOCATION #185**
[*A Radiative Transfer Approach to Characterizing the Optically Thin Dust Spectral Component in Mini-TES Observations of the Martian Surface*](#) [#1656]

This study focuses on the characterization of key radiative processes needed to describe the spectral features produced by thin mantles of dust in TIR datasets.

Rice M. S. Bell J. F. III **POSTER LOCATION #186**
[Characterizing the Effects of Viewing Geometry on the Reflectance Spectra of Rock Coatings](#) [#2866]
 We examine the effects of viewing geometry (forward-scattering vs. backscattering) on the Vis-NIR spectral properties of natural silica and ferric rock coatings.

Fraeman A. A. Arvidson R. E. Jolliff B. L. Morris R. V. **POSTER LOCATION #187**
[The Influence of the Textural Properties of Iron Oxides on Their Visible to Near Infrared Spectra and Applications to Mars](#) [#1503]
 We use iron oxide-bearing rocks that represent textural endmembers for martian materials to test current and next generation radiative transfer models.

Buz J. Ehlmann B. L. **POSTER LOCATION #188**
[Effects of Grain Size on the Reflectance Spectroscopy of Olivine in the Vis-NIR and the Derivation of Olivine Composition Using Modified Gaussian Modeling](#) [#2810]
 Grain size has a significant effect on the reflectance spectroscopy of olivine and can be confounding when determining composition remotely through MGM.

Pilorget C. Fernando J. Ehlmann B. L. Douté S. **POSTER LOCATION #189**
[Photometry of Particulate Mixtures: New Insight from Simulations of Light Scattering in a Compact Granular Medium](#) [#1541]
 We use a radiative transfer model to study the phase curve of different kinds of mixtures (spatial, intimate, and layered).

Pan C. Rogers A. D. **POSTER LOCATION #190**
[Thermal Infrared Spectral Analysis of Fine Grained Compacted Mineral Mixtures: Assessment of Applicability of Partial Least Squares \(PLS\) Methods and Implications for Spectral Interpretations of Martian Sedimentary Materials](#) [#2228]
 We assess the applicability of partial least-squares analysis to TIR spectra of pressed pellet samples of <10- μ m major primary and secondary mineral mixtures.

Ody A. Cannon K. M. Poulet F. Mustard J. F. Quantin C. et al. **POSTER LOCATION #191**
[Search for Analogue Sites of New Martian Shergottite Spectra Using NIR Data](#) [#2207]
 We compare NIR spectra of new shergottites with NIR OMEGA spectra of the martian surface in order to better constrain their possible geological settings and ages.

Farrand W. H. Johnson J. R. Bell J. F. III Rice M. S. Wright S. P. **POSTER LOCATION #192**
[Comparison of Rock Spectral Classes Observed at Cape York and Solander Point on the Rim of Endeavour Crater by the Opportunity Pancam](#) [#1596]
 Multispectral imaging by Opportunity of rock surfaces on Cape York and Solander Point at Endeavour Crater is described and compared to terrestrial analogs.

Liu Y. Glotch T. D. **POSTER LOCATION #193**
[Spectral Mixture Analysis of Hydrated Minerals in Southwest Melas Chasma](#) [#2443]
 We mapped the abundances of hydrated minerals derived by FATT in southwest Melas Chasma by doing a linear unmixing of retrieved CRISM single scattering albedos.

Jain N. S. Bhattacharya S. Chauhan P. Ajai A. **POSTER LOCATION #194**
[Aqueous Minerals from Arsia Chasmata of Arsia Mons, Tharsis Region: Implications for Aqueous Alteration Processes on Mars](#) [#1826]
 Aqueous minerals from Capri Chasma in Vallis Marineris on Mars give hints toward the study of the past environment history of Mars.

Ehlmann B. L. Buz J.

POSTER LOCATION #195

[Hydrology and Aqueous Alteration in the Watershed of Gale, Sharp, and Knobel Craters: A Regional Context for Curiosity's Exploration](#) [#2587]

Clay, chloride, and olivine units eroded by valley networks near Gale; timing of fluvial activity shows decreasing watershed size from Hesperian to Amazonian.

Horgan B. Seelos F.

POSTER LOCATION #196

[Constraints on the Geologic and Aqueous History of the North Polar Region of Mars from the Mineralogy of North Polar Sediments](#) [#2158]

The mineralogy of north polar sediments indicates northern plains sources for Planum Boreum materials, and constrains the ages of the north polar deposits.

Brunner A. E. Mahaffy P. R. McAdam A. C. Stern J. C. Ming D. W.

POSTER LOCATION #197

[Evolution of Hydrogen During SAM Analyses of the Sheepbed Mudstone, Gale Crater, Mars](#) [#1158]

Rover-drilled mudstone's / smectite clays degas when warmed: / SAM detects hydrogen.

Tate C. G. Moersch J. Jun I. Hardgrove C. Mischna M. et al.

POSTER LOCATION #198

[Water Equivalent Hydrogen Abundances Along the First 200 Sols of Curiosity's Traverse Using Passive Data from the Dynamic Albedo of Neutrons Experiment](#) [#1173]

MSL DAN passive data is used to estimate water equivalent hydrogen abundances along Curiosity's traverse in the shallow martian subsurface.

Audouard J. Poulet F. Vincendon M. Jouglet D. Milliken R. E. et al.

POSTER LOCATION #199

[Water-Equivalent Hydrogen Content of the Martian Surface](#) [#1765]

We use orbital spectroscopic data to estimate the water content of the martian surface. A global map is presented and hydration evolution is discussed.