

Friday, March 16, 2007

**MARS SEDIMENTS AND GEOCHEMISTRY: ATMOSPHERE, SOILS, BRINES, AND MINERALS**  
**8:30 a.m. Marina Plaza Ballroom**

**Chairs:** N. J. Tosca  
 G. J. Taylor

- 8:30 a.m. Soare R. J. \* Osinski G. R.  
*Periglacial Evidence (Using HiRISE, MOC and THEMIS Imagery) in Utopia and Western Elysium Planitia, for a Recent Wet and Warm Mars* [#1440]  
 Here we identify and discuss an assemblage of landforms in Utopia and western Elysium Planitia that is consistent with past and perhaps recent periglacial activity.
- 8:45 a.m. Mitrofanov I. G. \* Boynton W. V. Demidov N. E. Gilichinsky D. A. Litvak M. L. Kozyrev A. S. Sanin A. B. Saunders R. S. Smith D. E. Tretykov V. I. Zuber M. T.  
*Layering Structure of Water Ice Martian Permafrost: The Evidence from HEND/Odyssey and MOLA/MGS Data* [#1548]  
 Significant effect of strong negative correlation is studied between neutron data from HEND/Odyssey and MOLA/MGS radiometry data at 1064 nm, which is observed within two broad latitude belts at north (40°–80°N) and at south (40°S–60°S) on Mars.
- 9:00 a.m. Ostrowski D. R. \* Chevrier V. Chastain B. K. Sears D. W. G.  
*Experimental Study of the Water Vapor Interaction with Clay Regolith During Ice Sublimation on Mars* [#2097]  
 The sublimation rate of ice through montmorillonite is experimentally investigated under martian conditions. In addition the adsorption properties are studied to further understand the sublimation process.
- 9:15 a.m. Taylor G. J. \* Baloga S. M.  
*Regolith Evolution on Mars: The Preservation of Ancient Aqueous Alteration Products* [#1485]  
 A simplified model of regolith evolution involving aqueous alteration, volcanism, and impact gardening suggests that the weathering products in the current martian regolith were produced primarily during the period of early heavy bombardment.
- 9:30 a.m. Bryson K. L. \* Chevrier V. Sears D. W. G.  
*The Effect of a Fine-grained Basaltic Layer on the Evaporation of Ice Under Martian Conditions* [#1246]  
 Diffusion of water vapor through a fine-grained basaltic layer is experimentally investigated under martian conditions. It is shown to be similar to that through palagonite, but it is not strongly dependent on adsorption and/or desorption of water.
- 9:45 a.m. McMenamin D. S. \* McGill G. E.  
*Martian Glacial Morphology, Geomorphology, and Atmospheric Methane* [#1161]  
 Methane clathrate hydrate in martian glacial ice is the major reservoir for modern atmospheric methane, and also explains the existence of ancient glacial melt morphology.
- 10:00 a.m. Zolotov M. Yu. \*  
*Origin of Acid Fluids on Mars: Impacts vs. Volcanism* [#1343]  
 Impact generation of oxidants (O<sub>2</sub>, SO<sub>3</sub>, NO<sub>2</sub>) caused formation of strong acids and Fe(II) oxidation, the processes that are not efficient during O<sub>2</sub>-poor periods of volcanism. MER and TES data could be explained by impact-generated acid rainfalls.

- 10:15 a.m. Mironenko M. V. Zolotov M. Yu. \*  
*Timing of Acid Weathering and Oxidation on Mars* [#1594]  
Numerical kinetic-thermodynamic modeling of aqueous acid weathering show that martian surface could have been affected by multiple short-time episodes of acid alteration that limited oxidation of Fe(II) and rarely led to neutralization of solution.
- 10:30 a.m. Tosca N. J. \* McLennan S. M.  
*Fe-Oxidation Processes at Meridiani Planum and Implications for Secondary Fe-Mineralogy on Mars* [#1880]  
Fe-oxidation experiments in high ionic strength solutions were conducted. Implications of the results to diagenesis at Meridiani Planum and general surface geochemistry are discussed.
- 10:45 a.m. Morris R. V. \* Klingelhöfer G. Agresti D. G. Schröder C. Rodionov D. Yen A. Ming D. Athena Science Team  
*Identification of Iron-bearing Phases on the Martian Surface and in Martian Meteorites and Analogue Samples by Mössbauer Spectroscopy* [#1881]  
The iron-bearing phases on the martian surface and in martian meteorites and analogue samples, according to Mössbauer spectroscopy, are discussed.
- 11:00 a.m. Chipera S. J. \* Vaniman D. T. Peterson R. C. Fittipaldo M. M.  
*Can Sulfates Besides Those of Mg Form Low-Temperature Hyper-Hydrates?* [#1408]  
Sulfates of Na, K, Fe, Mg, Mn, and Zn were dissolved in excess water and frozen at  $-30^{\circ}$  and  $-50^{\circ}\text{C}$  to see if they would form extra-hydrated phases. Mg is presently the only sulfate observed to form an extra-hydrate not commonly observed on Earth.
- 11:15 a.m. Prieto-Ballesteros O. \* Fernandez-Remolar D. Mateo-Martí E. Fernandez-Sampedro M. Kargel J. S. Friedlander L. R. Martín-Gago J. A.  
*Phase Stability Experiments of Hydrated Magnesium Sulfates at Environmental Conditions of Martian Surface* [#1512]  
Experiments with different sulfates using conditions of the martian surface (T, P, radiation, atmospheric composition) have been performed to constrain the stability of the hydrated phases and detect any modification from their standard spectra.
- 11:30 a.m. Freeman J. J. \* Wang A. Jolliff B. L.  
*Pathways to Form Kieserite from Epsomite at Mid to Low Temperatures, with Relevance to Mars* [#1298]  
One hundred and twenty-six experiments on hydration and dehydration of Mg-sulfates were done at  $5^{\circ}\text{C}$ ,  $21^{\circ}\text{C}$ , and  $50^{\circ}\text{C}$ , using 10 humidity buffers. We found two pathways of forming kieserite from the dehydration of epsomite/hexahydrate at mid-low temperatures.