

**Friday, March 18, 2005**  
**MARS GEOCHEMISTRY AND WEATHERING**  
**1:30 p.m. Salon B**

**Chairs: J. P. Greenwood**  
**D. T. Vaniman**

- 1:30 p.m. Newsom H. E. \* Nelson M. J. Shearer C. K. Draper D. S.  
*The Martian Soil as a Geochemical Sink for Hydrothermally Altered Crustal Rocks and Mobile Elements: Implications of Early MER Results* [#1142]  
 An altered rock geochemical sink model can explain the new data for the martian soil. The altered rock component could have formed by hydrothermal processes at any time in Mars history before erosion to form part of the soil.
- 1:45 p.m. Tosca N. J. \* McLennan S. M. Clark B. C. Grotzinger J. P. Hurowitz J. A. Jolliff B. L. Knoll A. H. Schröder C. Squyres S. W. Athena Science Team  
*Geochemical Modeling of Evaporites on Mars: Insight from Meridiani Planum* [#1724]  
 A model predicting mineral solubility in evaporating basaltic weathering solutions is constructed and tested. Calculations modeling evaporation and diagenesis at Meridiani are consistent with much available data returned by the Opportunity rover.
- 2:00 p.m. Wänke H. Boynton W. V. Brückner J. \* Dreibus G. Taylor G. J. Evans L. James B. Keller J. Kerry K. Starr R. GRS Team  
*Sulfuric Acid All Over Early Mars?* [#1389]  
 The Gamma-Ray Spectrometer of the 2001 Mars Odyssey mission yielded concentration maps for several elements in the mid-latitude regions of Mars. The role of sulfur and other elements on the surface are discussed.
- 2:15 p.m. Vaniman D. T. \* Chipera S. J. Bish D. L. Carey J. W. Feldman W. C.  
*Martian Relevance of Dehydration and Rehydration in the Mg-Sulfate System* [#1486]  
 Mg-sulfate salts may cycle between desiccated amorphous and more hydrated crystalline forms in near-surface equatorial deposits on Mars.
- 2:30 p.m. Minitti M. E. \* Weitz C. M. Lane M. D. Bishop J. L.  
*Rock Coatings from Vulcano, a Martian Analog Environment* [#1835]  
 We studied the chemistry, mineralogy and spectral character of rock coatings from an analog Mars weathering environment, Vulcano (Italy). The samples illustrate that substrate chemistry and weathering conditions influence coating formation.
- 2:45 p.m. Quinn R. C. \* Zent A. P. Ehrenfreund P. Taylor C. L. McKay C. P. Garry J. R. C. Grunthaler F. J.  
*Dry Acid Deposition and Accumulation on the Surface of Mars and in the Atacama Desert, Chile* [#2282]  
 Soil pH and Mars Oxidant Instrument tests are consistent with oxidative reactions triggered by dust and transient wetting in the Atacama. These responses are consistent with Viking LR observations and can be explained by the solvation of soil acids.
- 3:00 p.m. Greenwood J. P. \* Gilmore M. S. Merrill M. D. Blake R. E. Martini A. M. Varekamp J.  
*Jarosite Mineralization in St. Lucia, W.I.: Preliminary Geochemical, Spectral, and Biological Investigations of a Martian Analogue* [#2348]  
 Jarosite mineralization at the St. Lucia volcano is described.

- 3:15 p.m. Hamilton V. E. \* Schneider R. D.  
*Alteration Phases Associated with High Concentrations of Orthopyroxene and Olivine on Mars* [#2212]  
Based on new deconvolution analyses using mineral end members, we are able to place quantitative constraints on the abundances of alteration phases associated with high concentrations of orthopyroxene and olivine on Mars.
- 3:30 p.m. Moore J. M. \* Bullock M. A. Sharp T. G. Quinn R.  
*Mars-Analog Evaporite Experiment: Initial Results* [#2246]  
We rapidly evaporated Mars-analog brine under modern Martian conditions. We found that the predominant phase is gypsum, which occurs with a mixture of hydrous sulfates such as hexahydrate, and possibly mirabilite, and starkeyite.
- 3:45 p.m. Bullock M. A. \* Moore J. M.  
*Aqueous Alteration of Basaltic Glass Under a Simulated Mars Atmosphere* [#2203]  
We have been performing experiments at NASA Ames that incubate volcanic glass in liquid water under Mars-simulated conditions. We find high levels of C, Fe, Ca, Mg, and Na in solution and a pH of 6.5 after 6 months.
- 4:00 p.m. Hausrath E. M. \* Brantley S. L. AMASE  
*Basalt Weathering Rates in a Mars Analog Environment: Clues to the Duration of Water on Mars?* [#2339]  
Basalt samples were collected from Spitsbergen, Norway, a Mars analog site, and analyzed for chemical and physical weathering. A preliminary weathering estimation was then made, which may help constrain the duration of weathering on Mars.
- 4:15 p.m. Chevrier V. \* Mathé P.-E. Rochette P.  
*Experimental Evidence of Martian Weathering* [#1784]  
Experimental weathering of primary iron phases in a CO<sub>2</sub> rich Martian atmosphere shows that the main neoformed iron (oxy)hydroxide under past conditions is goethite, associated to various phases (jarosite and siderite) depending on the substrate.
- 4:30 p.m. Parsons R. L. \* Head J. W. III Marchant D. R.  
*Weathering Pits in the Antarctic Dry Valleys: Insolation-induced Heating and Melting, and Applications to Mars* [#1138]  
A preliminary assessment of data collected from the Antarctic Dry Valleys in 2004 highlights two end-members of weathering pit development, and offers support for pit formation resulting from mineral breakdown by insolation-derived snowmelt.