

Thursday, March 13, 2008

POSTER SESSION II: ANALOGS: SULFATES — EARTH AND LAB TO MARS

6:30 p.m. Fitness Center

Socki R. A. Harvey R. P. Bish D. L. Tonui E. Bao H.

Stable Isotope Systematics of Cryogenic Evaporite Deposits from Lewis Cliff Ice Tongue, Antarctica:

A Mars Analog [#1946]

We report stable isotope results of evaporite mounds and associated moraine materials from Lewis Cliff, Antarctica. Data suggest evaporite mineral formation likely occurred sub-glacially, influenced by secondary glacial ice and/or moraine lake water.

Freeman J. J. Jin M. Wang A.

D₂O Substitution Experiment on Hydrated Iron and Magnesium Sulfates and Its Application for Spectral

Interpretation of Martian Sulfates [#2390]

NIR diffuse reflectance, mid IR, and Raman spectra were obtained from synthesized hydrates and deuterated hydrates of epsomite and melanterite. The data will aid in the interpretation of the NIR (1–5 μm) spectra obtain from OMEGA and CRISM.

Rull F. Fleischer I. Martinez-Frias J. Sanz A. Upadhyay C. Klingelhöfer G.

Raman and Mössbauer Spectroscopic Characterisation of Sulfate Minerals from the Mars Analogue Sites at

Rio Tinto and Jaroso Ravine, Spain [#1616]

A combined Raman and Mössbauer spectroscopic study of natural sulfates from two martian analogues, Rio Tinto and Jaroso Ravine (Spain), is presented. The work was performed in similar experimental conditions to those envisaged for Mars surface within the ExoMars mission.

Lacelle D. Léveillé R. Lauriol B. Clark I. D. Doucet A.

Acid Drainage and Associated Sulphate Mineral Formation Near Eagle Plains, Northern Yukon, Canada:

Analogue to the Meridiani Planum Sulphates on Mars [#1264]

In this study, the hydrogeochemical processes responsible for acid drainage and the precipitation of gypsum, jarosite and Fe oxides near Eagle Plains, northern Yukon, and its implication to early Mars aqueous geochemistry are examined.

Chipera S. J. Bish D. L. Sarrazin P. Alcantar-Lopez L. Vaniman D. T. Blake D.

Sulfate Mineralogy from Acid-Alteration of Pyrite: Leadville, Colorado [#1462]

Sulfate minerals produced from acid alteration of pyrite in mine spoil piles at Leadville, CO, allows its consideration as a Mars analog site, especially during colder winter months due to direct relevance to the cold temperatures encountered on Mars.

Marion G. M. Crowley J. K. Thomson B. J. Hook S. J. Bridges N. T. Brown A. J.

Kargel J. S. de Souza Filho C. R.

Acidic Australian Playa Lakes as Analogues for Mars [#1772]

This abstract will (1) add new chemistries (Al and Si) to an existing acid chemical thermodynamic model (FREZCHEM), (2) use the model to characterize acidic Australian playa lakes (Gilmore and Swann), and (3) extend these Earth analogues to martian environments.

Wang A. Freeman J. J. Arvidson R. E.

Study of Two Structural Polymorphs of MgSO₄•H₂O by Raman, IR, XRD, and Humidity Buffer Experiments —

Implication for Martian Kieserite [#2172]

Two structural polymorphs of MgSO₄•H₂O were investigated by Raman, IR, and XRD. Their formation pathways and stability fields provide important clues to understand the origin of martian kieserite.

Grindrod P. M. Fortes A. D. Wood I. G. Sammonds P. R. Dobson D. P. Middleton C. A. Vocadlo L.
Synthesis and Strength of $MgSO_4 \cdot 11H_2O$ (Meridianiite): Preliminary Results from Uniaxial and Triaxial Deformation Tests [#1199]

We describe methods for synthesising the hydrated magnesium sulfate mineral meridianiite, and present preliminary results of triaxial and uniaxial deformation tests. The results are important in studies of icy moon convection and the martian water budget.

Barge L. M. Petruska J. Chan M. A. Potter S. L. Nealson K.
Formation of Spherical Precipitates in Diffusion-controlled Systems — A Possible Laboratory Analogue for the Martian Hematite Concretions [#1414]

We present the results of laboratory diffusion experiments that produce spherical concretions similar to those found in natural environments such as the Navajo Sandstone in Utah and Meridiani Planum, Mars.

Chavdarian G. V. Sumner D. Y.
Crack Geometry and Morphology in Hydrous Sulfate Sands [#2285]

We use observations of crack morphology in gypsum sand from an analog site at White Sands National Monument, New Mexico, to understand the processes affecting crack morphology over time in order to develop working hypotheses of cracks on Meridiani.

Murphy N. W. Mellon M. T. Jakosky B. M. Budd D. A.
Thermophysical Properties of a Possible Martian Duricrust Analog [#2129]

We examined a terrestrial deposit of gypsum duricrust located near Las Cruces, NM, and measured its thermophysical properties. We used the thermal properties to then evaluate whether this duricrust is representative of indurated surfaces on Mars.