

Thursday, March 15, 2007

**POSTER SESSION II: LABORATORY INSTRUMENTS, METHODS, AND  
TECHNIQUES TO SUPPORT PLANETARY EXPLORATION**

**6:30 p.m. Fitness Center**

Huss G. R. Nagashima K. Keil K. Krot A. N. Taylor G. J. Scott E. R. D.

*The Cameca ims 1280 Ion Microprobe at the University of Hawai'i* [#2128]

This poster describes the new Cameca ims 1280 ion microprobe and the analyses that have been carried out since its installation. Details of oxygen-isotope measurements, Mn-Cr measurements, and Fe-Ni measurements will be presented.

Rauschenbach I. Lazic V. Jovicevic S. Jessberger E. K. Fantoni R.

*LIBS in the Cold: Laser Induced Breakdown Spectroscopy of Soils, Rocks and Ice Under Simulated Martian Conditions* [#1284]

LIBS (Laser Induced Breakdown Spectroscopy) is proposed for the *in situ* analysis of Mars. We found that LIBS signals from martian analogue materials not only depend on martian environmental conditions but also strongly vary with surface temperature.

Niles P. B. Socki R. A. Hredzak P. L.

*A New Method for Evaluating the Carbon Isotope Characteristics of Carbonate Formed Under Cryogenic Conditions Analogous to Mars* [#2157]

This study demonstrates an innovative new method for studying the kinetic isotopic effects caused by rapid freezing of transient water on the martian surface which may explain the very high  $\delta^{13}\text{C}$  values of carbonates found in the martian meteorites.

Baldrige A. M. Christensen P. R.

*A Laboratory Technique for Thermal Infrared Measurement of Hydrated Samples* [#2407]

Laboratory thermal infrared spectroscopy has been utilized for comparison to planetary surfaces. The sample is usually heated well above room temperature. At this temperature hydrated samples can lose water. This study describes the method for measuring the TIR spectra of hydrated samples.

Pommerol A. Schmitt B. Brissaud O.

*Effects of Surface Texture and Observation Geometry on the Near-Infrared Water-of-Hydration Absorption Bands* [#1774]

We use laboratory experiments and radiative transfer modeling to determine the effects of materials texture and measurement geometry on the near-infrared absorption bands due to water-of-hydration.

Fries M. D. Steele A.

*Methods of Extraterrestrial Materials Analysis Using Raman Spectroscopic Imaging* [#2195]

With recent advancements in instrumentation, Raman spectroscopic imaging is an emerging technique in the characterization of extraterrestrial materials. This paper discusses application and methods of this new technique.

Chemtob S. M. Glotch T. D.

*Linear Deconvolution of Attenuated Total Reflectance Infrared Spectra of Fine-grained Mineral Mixtures* [#1097]

ATR-IR spectroscopy has potential as an *in situ* method for determining mineralogy on future planetary lander missions. We test deconvolution algorithms on ATR spectra of mineral mixtures, confirming linear mixing and identifying sources of error.

Glotch T. D. Chemtob S. M. Rossman G. R.

*Attenuated Total Reflection as an In Situ Infrared Spectroscopic Method for Mineral Identification* [#1731]

Attenuated total reflection (ATR) is an infrared spectroscopic method that is useful for determining the mineralogy of fine particulates and has potential as a future *in situ* mineralogic analysis instrument on a planetary mission. We describe the results of initial laboratory ATR experiments.

Maruyama Y. Ogawa K. Okada T. Kato M.

*Particle Size Effect in X-Ray Fluorescence and Its Implication to Planetary XRF Spectroscopy* [#1186]

We performed laboratory experiments to investigate particle size effect in X-ray fluorescence. Powdery specimens of rocks are used to simulate the planetary surface regolith. This effect was found to be notable at higher phase angles.

Dyar M. D. Sklute E. C. Schaefer M. W. Bishop J. L.

*Mössbauer Spectroscopy of Clay Minerals at Variable Temperatures* [#2282]

Quantification of fundamental Mössbauer parameters for low-temperature spectra of clay minerals is critical to proper interpretation of their ferric and ferrous iron contents. Recoil-free fractions for nontronite, montmorillonite, biotite, zinnwaldite, and glauconite are presented here.