

Thursday, March 15, 2007

**POSTER SESSION II: MARS SEDIMENTS AND GEOCHEMISTRY:
REGOLITH, SPECTROSCOPY, AND IMAGING**

6:30 p.m. Fitness Center

Hurowitz J. A. Yen A. S. Kim S.

Experimental Constraints on Oxygen Gas Release and Mobility of Adsorbed Superoxide in Martian Soils [#2041]

We report on new experiments designed to further examine the role of superoxide adsorbed on silicate mineral surfaces as an oxidant in martian soils.

Mellon M. T. Putzig N. E.

The Apparent Thermal Inertia of Layered Surfaces on Mars [#2184]

We examine the effects of shallow layering in the martian subsurface on the diurnal and seasonal surface temperatures, and on the apparent thermal inertia as has been derived from temperature measurements and assuming soil homogeneity.

Osterloo M. M. Anderson F. S. Hamilton V. E. Glotch T. D.

Analysis of a Spectrally Distinct Surface Feature in the Terra Sirenum Region of Mars from THEMIS and TES [#1814]

We investigate a spectrally distinct region in the southern highlands of Terra Sirenum which was located during a survey of Mars Odyssey Thermal Emission Imaging System (THEMIS) daytime infrared (IR) decorrelation stretched (DCS) images.

Demidov N. E. Boynton W. V. Gilichinsky D. A. Litvak M. L. Kozyrev A. S. Mitrofanov I. G.

Sanin A. B. Saunders R. S. Smith D. E. Tretykov V. I. Zuber M. T.

Searching for Correlation Between Neutron Albedo and Near-IR Albedo of Mars Surface Using HEND/Odyssey and MOLA/MGS Data [#1640]

Strong negative correlation between HEND neutron albedo and MOLA near-IR albedo is found within two broad latitude belts: 40°N–80°N and 40°S–60°S. Interpretation: water ice in these belts is buried below the dry skin layer, which thickness is determined by heating of subsurface material by sunlight.

Maurice S. Feldman W. Prettyman T. Diez B. Gasnault O.

Reduction of Mars Odyssey Neutron Data [#2036]

First presentation of overall processing of neutrons data collected by the Los Alamos built spectrometer onboard the Mars Odyssey spacecraft.

Vincendon M. Langevin Y. Poulet F. Bibring J.-P. Gondet B.

Retrieval of Surface Lambert Albedos and Aerosols Optical Depths Using OMEGA Near-IR EPF Observations of Mars [#1650]

We have analyzed five EPF sequences acquired by OMEGA/Mars Express in the near-IR over ice-free and ice-covered surfaces to retrieve simultaneously the Lambert albedo of the surface and the optical depth of aerosols.

Maturilli A. Helbert J. Moroz L.

The Berlin Emissivity Database (BED): A Collection of Emissivity Spectra for Planetary Analogue Minerals [#1281]

The Berlin Emissivity Database contains spectra of feldspars, pyroxenes, olivine, sulphur, martian analogues, volcanic soils in the range 7–22 μm as a function of particle size. For each sample four particle size separates from <25 to 250 μm are measured, with a spectral resolution of 4 cm^{-1} .

Kirkland L. E. Herr K. C. Adams P. M.

Straightforward Results from a Mars Analog Site (Alunite, Nevada): Learning to Combine Near- and Thermal-Infrared Spectral Interpretations for Mars [#2232]

We combine reflectance and emission airborne spectra to identify minerals. The results illustrate a case that worked well in using different parts of the remote sensing spectrum to identify Mars analog materials, e.g., alunite and gypsum.

Kirkland L. E. Herr K. C. Adams P. M. Staab B. M.

Hard Lessons from a Mars Analog Site (Mineral Park Copper Mine): Learning to Combine Near- and Thermal-Infrared Spectral Interpretations for Mars [#2200]

We combine reflectance and emission airborne spectra measured of a mine site that has jarosite. The results help identify issues in using different parts of the remote sensing spectrum to identify materials on Mars, with jarosite as the example.

Lane M. D. Dyar M. D. Bishop J. L.

Spectra of Phosphate Minerals as Obtained by Visible-Near Infrared Reflectance, Thermal Infrared Emission, and Mössbauer Laboratory Analyses [#2210]

We will present a multi-technique spectroscopic survey of phosphate minerals using visible-near infrared reflectance, thermal infrared emission, and Mössbauer spectroscopies.

Benedix G. K. Hamilton V. E.

Infrared (2.5 to 14 μm) Reflectance Microspectroscopy of Meteoritic Minerals in Thin Section [#1805]

We present microspectroscopy of martian meteorite minerals acquired in thin section. The technique provides addition of endmembers to the available spectral libraries with specifically martian or other non-terrestrial mineralogy to help understand the geology of the surface of Mars.

Minitti M. E. Hamilton V. E. Wyatt M. B.

Deconvolution of Martian Thermal Infrared Spectra Using a Simplified, Glass-rich Library [#2099]

We deconvolved two global and eleven regional Mars surface spectra utilizing a library that includes six glasses from basaltic to rhyolitic in composition but excludes carbonates, amphiboles, alkali feldspars and almost all clays and phyllosilicates.

Rampe E. B. Kraft M. D. Sharp T. G. Michalski J. R.

The Effects of Small Amounts of Chemical Weathering on Thermal Infrared Spectral Models: Implications for Martian Surface Mineralogy [#2227]

Modeled mineralogy of TIR spectra of physical mixtures containing secondary silicates show secondary silicates affect modeled primary mineralogy and cause identification of primary glass. These results support Surface Type 2 as a weathered basalt.

Ashley J. W. Ruff S. W. Christensen P. R. Leshin L. A.

Metallic Iron in Meteorites as a Sensitive Tracer of Surface-Volatile Interactions on Mars — A Progress Report [#2264]

We report on studies designed to address whether alteration products in meteorites on Mars might be useful in assessing paleoclimatic conditions on the planet. Laboratory work is used in concert with Mini-TES on the MERs to identify meteorite candidates and evaluate their spectral emissivity.

Kraft M. D. Sharp T. G. Michalski J. R. Rampe E. B.

Combined Thermal and Near Infrared Spectra of Hydrous Silica Coatings: Implications for Surface Type 2 Mineralogy and Recent Liquid Water on Mars [#2241]

Basalt coated by hydrous silica shows large effects on thermal-IR laboratory spectra but little effect on near-IR spectra. TES type 2 surfaces are consistent with such coatings, perhaps indicating liquid water on Mars has been recent and widespread.

Combe J.-Ph. Adams J. B. McCord T. B.

Methodology to Investigate Mars's Surface Properties and Composition Using HRSC Data: First Results [#2367]

The objective is to investigate the geological units of the surface of Mars by analysing the Mars-Express/HRSC data. A simulation of the effects of the surface roughness and the complex geometry of acquisition is performed prior to spectral analysis.

Pommerol A. Schmitt B. Bibring J.-P. OMEGA Team

Origins of the Spatial Variations of the Water-of-Hydration Near-Infrared Absorption Bands Observed by OMEGA/Mars Express on the Martian Surface [#1787]

We try to determine the origins of the spatial variations of the water-of-hydration near-infrared absorption bands observed by the OMEGA instrument on the martian surface. We compare OMEGA measurements with results from laboratory experiments and radiative transfer modeling.

Calvin W. M.

Hydration on Mars: A New Method for Rapid Assessment of Extremes [#1390]

A new method to determine variation in the 3- μm absorption feature is demonstrated with ISM. Increased hydration is seen in the Valles Marineris in areas that correlate well with exposures of hematite and sulfates identified by TES and OMEGA.

Wyatt M. B. McSween H. Y. Jr.

TES and GRS Compositions of the Martian Surface: Evidence for Igneous and Secondary Chemical Fractionation Processes [#2258]

We examine TES derived major oxide abundances of low-albedo surface materials and compare global distributions to GRS derived element abundances to constrain the relative roles of igneous and alteration processes on Mars.

Koeppen W. C. Hamilton V. E.

Geologic Setting of the Olivine-bearing Materials in Terra Tyrrhena [#1134]

We discuss the occurrence and mineralogic and geologic settings of materials in Terra Tyrrhena that contain different compositions of olivine.

Gondet B. Bibring J.-P. Langevin Y. Poulet F. OMEGA Science Team

Global Inventory of Olivine-rich Sites at the Surface of Mars as Determined by the OMEGA/Mars Express Imaging Spectrometer [#1681]

A global inventory of Mars olivine-rich sites has been achieved from the OMEGA/Mars Express mapping of the entire surface of Mars. We will discuss the occurrence of the variety of olivine-rich spots, in the framework of the Mars magmatic evolution.

Knudson A. T. Roach L. H. Arvidson R. E. Christensen P. R. Murchie S. L. Mustard J. F.

The Geologic Context of Hematite in Valles Marineris: Comparison of CRISM Data to Results from TES, THEMIS and OMEGA [#2333]

Analysis of CRISM images in Valles Marineris indicates a consistency with previous analyses from TES, THEMIS, and OMEGA but reveals details of relationships between hematite and sulfates that will provide insight into genetic relationships.

McDowell M. L. Hamilton V. E.

Phyllosilicate Detection and Uncertainty from Thermal Infrared Data in the Vicinity of the Nili Fossae [#1872]

We examine TIR data from THEMIS and TES in areas identified by OMEGA as containing phyllosilicates. Our investigation will help to constrain phyllosilicate detection limits in TES data and likely surface abundances on Mars.

Bishop J. L. Lane M. D. Dyar M. D. Brown A. J.

Multi-Spectral Study of Phyllosilicates and Applications to Mars [#1815]

We are investigating several high-purity phyllosilicates in a multi-spectral study in order to compare spectral features across several techniques and to enable analyses of current martian data.

Limaye A. Tanaka K. L. Skinner J. A. Jr. Hare T. M.
Mapping Finely Layered Highland Rocks (FLHR) for Mars Science Laboratory Landing Site Selection [#2433]
Finely layered highland rocks are being mapped to contribute to a GIS interface for evaluation of Mars Science Laboratory landing sites.

Hamilton V. E. Osterloo M. M. McGrane B. S.
THEMIS Decorrelation Stretched Infrared Mosaics of Candidate 2009 Mars Science Laboratory Landing Sites: Evidence for Significant Spectral Diversity [#1725]
We produced $3^\circ \times 3^\circ$ decorrelation stretched IR mosaics of 33 candidate landing sites for the 2009 MSL mission. These mosaics are available to the community, and we are compiling a database of surface composition variations for further study.

Rossi A. P. Zegers T. Pondrelli M. Gwinner K. Hauber E. Neukum G. Velasco E. Stesky R. Fueten F. Chicarro A. Foing B.
HRSC-based Mapping and Internal Architecture of Gale Crater (Mars) [#1553]
New observations on the geomorphology and internal geometry of Gale crater central bulge are presented. We used a new HRSC stereo-derived DTM in order to better define morphology and layering attitude within bulge deposits.

Russell P. S. Weitz C. Lefort A. Thomas N. McEwen A. HiRISE Team
Mars Crater Interior Layers Viewed by HiRISE [#2394]
Comparison of equatorial and high-latitude crater-interior layers using HiRISE high-resolution, stereo, and color data to determine modes of formation and roles of volatiles.

Lucchitta B. K.
Multiple Erosional and Depositional Episodes in West Candor Chasma, Mars [#2093]
Deposits of diverse origins overtopped mesas capping Ceti Mensa and were eroded in turn. Layered deposits in adjacent lowlands overlie landslides and are inclined and disrupted near chasma walls. Sinuous ridges in the lowlands suggest former fluvial activity.

Lahtela H. Korteniemi J. Baratoux D. Vaucher J. Raitala J.
History of Water in a Martian Crater in Northern Arabia Terra [#1863]
The focus of the study is a highly modified crater in Arabia Terra, Mars. It has undergone complex post-formation evolution and there is multitude of evidence of water-related processes.