

Tuesday, March 20, 2012

MARTIAN HYDRATED MINERALS AND VOLATILES FROM MANTLE TO SURFACE

1:30 p.m. Waterway Ballroom 6

Chairs: Tomohiro Usui
Joseph Michalski

- 1:30 p.m. Channon M. B. * Boyce J. W. Stolper E. M. Eiler J. M.
[*Abundances of Cl, F, H, and S in Apatites from Martian Meteorites*](#) [#2845]
Apatites from basaltic shergottites have higher abundances of water and sulfur than other SNC rock types, and match (in the case of water) or exceed (in the case of sulfur) abundances of terrestrial igneous mafic rocks.
- 1:45 p.m. McCubbin F. M. * Hauri E. H. Elardo S. M. Vander Kaaden K. E.
Wang J. Shearer C. K. Jr.
[*Hydrous Melting of the Martian Mantle Produced Both Depleted and Enriched Shergottites*](#) [#1121]
Water contents of apatite from a depleted and an enriched shergottite indicate that hydrous melting of the martian interior occurred for both sources. Elevated water contents in the depleted source indicate early storage of water in Mars' interior.
- 2:00 p.m. Jones J. H. * Usui T. Alexander C. M. O'D. Simon J. I. Wang J.
[*Provenance and Concentration of Water in the Shergottite Mantle*](#) [#2560]
H₂O and Na₂O abundances in shergottite Y980459, coupled with simple melting models, imply that the water content of the depleted shergottite source region is 16–33 ppm. The D/H ratio of this water is approximately chondritic, or “Earthlike.”
- 2:15 p.m. Usui T. * Alexander C. M. O'D. Wang J. Simon J. I. Jones J. H.
[*Evidence from Olivine-Hosted Melt Inclusions that the Martian Mantle has a Chondritic D/H Ratio and that Some Young Basalts have Assimilated Old Crust*](#) [#1341]
Olivine-hosted melt inclusions from a depleted shergottite (Y-980459) possess undegassed water with near-chondritic δD of ~275‰. In contrast, a melt inclusion from an enriched shergottite (LAR 06319) exhibits an atmospheric/surficial δD of ~5000‰.
- 2:30 p.m. Hallis L. J. * Taylor G. J. Nagashima K. Huss G. R.
[*Magmatic Water in Martian Meteorites*](#) [#2317]
We studied the hydrogen-isotope composition of Nakhla apatites in an attempt to measure the primordial martian D/H ratio.
- 2:45 p.m. Stanley B. D. * Hirschmann M. M.
[*Solubility of C-O-H Volatiles in Graphite-Saturated Martian Basalts*](#) [#2050]
We investigate the solubility of carbon dioxide in martian analogue basaltic melts with graphite present to constrain the magmatic outgassing fluxes of carbon dioxide during martian atmospheric evolution.
- 3:00 p.m. Mustard J. F. * Poulet F. Ehlman B. E. Milliken R. E. Fraeman A.
[*Sequestration of Volatiles in the Martian Crust Through Hydrated Minerals: A Significant Planetary Reservoir of Water*](#) [#1539]
We derive a first-order estimate of the size of the water reservoir in the martian crust defined by hydrous minerals integrating data and results from orbital, lander data of Mars and meteorite analyses.
- 3:15 p.m. Smith M. R. * Bandfield J. L.
[*Hydrated Silica on Mars: Near-IR and Thermal-Infrared Spectroscopic Investigation Into the Diversity of Martian Silica*](#) [#1641]
We are using near-infrared and thermal infrared spectroscopy to examine the range of martian hydrated silica compositions and find that there are variable compositions among detected silicas.

- 3:30 p.m. McKeown N. K. * Mazurok J. Kamanos K. Wray J. J.
[Mineralogies of the Amenthes-Northern Terra Cimmeria Region, Mars](#) [#2670]
Amenthes and northern Terra Cimmeria have been studied geomorphically but the mineralogy has not yet been studied in detail. Our preliminary studies indicate the presence of olivine, low-calcium pyroxene, and a hydrated mineral (possibly carbonate).
- 3:45 p.m. Bishop J. L. * Rampe E. B.
[Allophane Identified at Mawrth Valles in CRISM and TES Datasets and Implications for the Ancient Phyllosilicate-Rich Rocks](#) [#2277]
Allophane has been identified at Mawrth Vallis in the upper Al/Si-rich clay unit using CRISM data and in the region at ~10% through modeling of TES data. This implies the presence of young, well-drained soils in neutral to mildly acidic conditions.
- 4:00 p.m. Che C. * Glotch T. D.
[Characterizing Dehydrated and Dehydroxylated Phyllosilicates on Mars Using Thermal and Near IR Spectroscopy](#) [#1377]
The objective of this work is to identify, map, and characterize dehydrated and dehydroxylated clays on Mars, using TES and CRISM data. The significant suite of our previous laboratory spectra will be the basis for our TES and CRISM data analysis.
- 4:15 p.m. Flahaut J. * Quantin C. Bishop J. L. Fueten F. Allemand P. Mangold N. Poulet F. Bibring J.-P.
[Mineralogic Investigation of Capri/Ganges/Eos Chasmata, Mars: Insights into the Geologic History of Valles Marineris](#) [#1823]
We present here detailed analyses of Ganges, Capri, and Eos chasmata (Valles Marineris eastern end) using high-resolution morphologic and mineralogic data from the Mars Reconnaissance Orbiter (MRO) mission.
- 4:30 p.m. Michalski J. R. * Rogers A. D. Wright S. P. Niles P. B. Cuadros J.
[Sporadic Groundwater Upwelling in Deep Martian Craters: Evidence for Lacustrine Clays and Carbonates](#) [#1431]
We searched for evidence of groundwater upwelling in deep martian craters and found only rare evidence for such processes. However, some cases suggest that groundwater-fed lakes have existed and led to the formation of lacustrine clays and carbonates.