WATER IN THE MARTIAN INTERIOR: CONSTRAINTS AND IMPLICATIONS

Tuesday, November 4, 2014

8:30 a.m.  LECTURE HALL

Chairs: Walter Kiefer
        David Baratoux

Jones J. H. *  [INVITED 30 MINUTES]
Arguments in Support of a Dry Martian Mantle [#1018]
Both theoretical considerations and analysis of primitive martian basalts imply that the martian mantle is petrologically dry.

McCubbin F. M. * Boyce J. W.  [CONTRIBUTED 20 MINUTES]
Substantial progress has been made in using apatite to understand the concentrations of H2O in the melts from which they formed. This paper seeks to explore the implications for Mars magmatic H2O abundances from apatite in shergottites.

Insights into Evolution of Volatiles in Martian Magma Based on a Reconstruction of NWA 2975 Phosphate Crystallization Process — A Combined TEM, Synchrotron FTIR- and Raman-Spectroscopic Study [#1007]
This contribution presents the evolution path of volatiles in martian magma based on the analysis of the crystallization process of phosphates (apatite, merrillite) from NWA 2975 using TEM, synchrotron FTIR-, and Raman-spectroscopy methods.

Mane P. * Hervig R. Wadhwa M. Garvie L. A. J.  [CONTRIBUTED 20 MINUTES]
Hydrogen Isotopic Composition of the Mars Mantle Inferred from the Most Recent Martian Meteorite Fall, Tissint [#1020]
We report hydrogen isotopic composition of various igneous mineral phases of a martian meteorite Tissint.

BREAK

Kiefer W. S. *  [CONTRIBUTED 20 MINUTES]
Water Under-Saturated Mantle Plume Volcanism on Mars [#1023]
The present-day martian mantle contains several hundred ppm of volatiles such as water, chlorine, and fluorine, which lower the solidus. Two hundred ppm of water increases the mantle plume magma production rate by about 50% relative to a dry mantle.

Nekvasil H. and DiFrancesco N. *  [INVITED 30 MINUTES]
The role of magmatic water in dictating surface lithologies.

Gross J. * Filiberto J.  [CONTRIBUTED 20 MINUTES]
Granitic Compositions in Gabbroic Martian Meteorite NWA 6963: Evidence for Extreme Fractional Crystallization of a Hydrous Magma [#1015]
Here, we report mineralogy, petrography, and textures of two types of granitic compositions found in NWA 6963 and discuss the implications of our results for the volatile content of the parental melt of NWA 6963 and the geological history of Mars.

Baratoux D. * Monneremeau M. Samuel H. Michaut C. Wieczorek M. A.  [CONTRIBUTED 20 MINUTES]
A Large Buried Felsic/Anorthositic Component in the Ancient Martian Crust [#1003]
The density of the basaltic component of the martian crust is revised to values >3100 kg/m3 in light of new data. A buried light (feldic/anorthositic) component is required to explain the field of gravity. It possible origins are discussed.

DISCUSSION