Monday, March 23, 2009

ASTROBIOLOGY: METEORITES, MICROBES, HYDROUS HABITATS, AND IRRADIATED ICES
8:30 a.m. Waterway Ballroom 6

**Chairs:**
Inge ten Kate  
Elisabeth Hausrath

8:30 a.m.
*Development of Life on Early Mars [#1175]*

For life to exist on a planet there must be water, carbon and energy sources along with a dynamic geologic past. Mars meets all of these requirements. Life is probably present beneath the surface of Mars today in regions associated with water.

8:45 a.m.
Vítek P. * Jehlička J. Edwards H. G. M. Osterrothová K.  
*β-Carotene as a Potential Biomarker in Martian Evaporitic Rocks: Evaluation of Raman Microspectrometric Analysis [#1729]*

In this study, Raman microspectrometry was tested as a nondestructive method of determining the lowest detectable beta-carotene content in experimentally prepared evaporitic matrices (with respect to martian geology) namely, gypsum, halite and epsomite.

9:00 a.m.
*Micro-Scale Characteristics of Insoluble Organic Matter in Chondrites: A Coordinated TEM, STXM and SIMS Study [#1145]*

A coordinated study of meteoritic insoluble organic matter reveals that hollow organic globules are chemically similar to other IOM, but abundances and sizes of globules vary between meteorites. IOM is sensitive to electron and X-ray induced beam damage.

9:15 a.m.
Berkley J. L. * Dykstra K.  
*Mars Sediment Analog? Dark Biomineralized Mn-Oxide/Hydroxide Cemented Sandstone of Low-T Spring Origin [#1963]*

A dark colored sandstone permeated by paleo-aqueous spring flow contains Ba-rich, Mn oxide/hydroxide mineralization of probably biogenic origin. On a wetter and warmer Mars, similar processes may have acted to produce dark, biomineralized sediments.

9:30 a.m.
Fernández-Remolar D. C. * Sánchez-Román M. Rodríguez N. Amils R. Romanek C.  
*The Association of Carbonate Minerals to Acidic Environments: A Possible Biosignature for Mars [#1214]*

Carbonate minerals are associated to extremely acidic environments of Río Tinto. Microbes mediate carbonate in acidic sediments and subsurface. Under these circumstances, same carbonate phases could be used as potential biosignatures to detect life on Mars.

9:45 a.m.
Johnson S. S. * Carr C. E. Amils R. Zuber M. Ruvkun G.  
*Extensive Sequencing Approaches to the Search for Life: Initial Results from the Rio Tinto [#2532]*

We present the SETG instrument and consider this new life detection strategy vis-à-vis a training set of phylotypes detected in the Mars-like chemistry of the Rio Tinto.

10:00 a.m.
*High Lakes Project — Impact of Climate Variability and High UV Flux on Lake Habitat: Implications for Early Mars and Present-Day Earth [#1141]*

HLP studies lakes between 4,200–6,000 m elevation in the Central Andes. Its primary objective is to understand the impact of increased environmental stress on lake habitats and their evolution during rapid climate change as an analogy to early Mars.
10:15 a.m. Abramov O. *  Mojzsis S. J.
*Microbial Habitability of the Hadean Earth During the Late Heavy Bombardment* [#2379]
We explored the thermal state and habitability of Hadean Earth during the late heavy bombardment using several thermal models of the lithosphere. Our analysis shows that there is no plausible scenario in which the habitable zone was fully sterilized.

10:30 a.m. Bao H. *
*How to Make Otherworldly Oxygen Isotope Signatures on Earth and to Preserve Them in Rocks* [#2174]
I identify here two major pathways by which $^{17}$O-anomalous sulfate oxygen isotope compositions can be generated with $^{17}$O enrichment and $^{17}$O depletion, respectively.

10:45 a.m. Fu Q. *  Seyfried W. E. Jr.
Carboxylic acids were observed in carbon reduction experiments using a hydrothermal flow reactor. Controlling factors for hydrocarbon formation were identified. It provides evidence for evaluating abiogenic synthesis on Mars and other planets.

11:00 a.m. Vance S. *
*Habitability of Icy Worlds Electrochemical Capacitance of Serpentinizing Hydrothermal Systems* [#1994]
Deeply fractured rock, slow steady serpentine springs, renewed by heat flash.

11:15 a.m. Nna-Mvondo D. *  Khare B. N.  McKay C. P.
*Experimental Simulation of Chemistry Induced by Hypervelocity Impacts on Icy Moons Surfaces: Laser-induced Shocks in Ices* [#2507]
We have conducted laboratory experiments to study the possible chemical production induced by meteoritic impact shocks on planetary ices. A pulsed Nd-YAG laser was used to reproduce the shock phenomena during hypervelocity impacts into the ice.

11:30 a.m. Milam S. N. *  Nuevo M.  Sandford S. A.  Elsila J. E.  Dworkin J. P.
*Photo-Irradiation of Pyrimidine in Interstellar Ice Analogs: Searching for Nucleobases* [#2330]
Nucleobases have been detected in meteorites and possibly form in space. The functionalization of PAHs from UV photons in mixed ices has proven effective in the lab. Here we investigate how irradiation affects pyrimidine in interstellar ice analogs.