

Thursday, March 15, 2007
POSTER SESSION II: ASTROBIOLOGY
6:30 p.m. Fitness Center

Amashukeli X. Pelletier C. C. Kirby J. P. Willis P. A. Grunthner F. K.
Subcritical Water Extraction of Amino Acids from Arid Atacama Desert Soils: Laboratory Study in Support of In Situ Urey Instrument Suite [#1802]

We developed a subcritical water extractor (SCWE) for compounds with dissimilar properties. Data demonstrates successful extraction of amino acids and is used to miniaturize SCWE. Our studies support ESA ExoMars mission Urey instrument development.

Kotler J. M. Hinman N. W. Yan B. Stoner D. L. Scott J. R.
Jarosite as a Storage Mineral for Small Organic Molecules: Investigations of Natural Samples Using an 'In Situ' Laser Desorption Fourier Transform Mass Spectrometry Technique [#1858]

The use of laser desorption Fourier transform mass spectrometry has revealed the presence of organic matter in several jarosite samples from various locations worldwide including jarosite precipitated in the lab by *acidithiobacillus ferroxidans*.

Denson J. Ivey D. M. Sears D. W. G. Gucsik A. Vidéki R.
Cathodoluminescence and Its Application for Biosignature Analysis of Mn-containing Biogenic Minerals: A Review [#1009]

Cathodoluminescence could provide a novel analytical methodology for differentiating biogenic vs. abiogenic minerals, providing a new tool for both astrobiologists and biogeochemists alike.

Léveillé R. J. Konhauser K. O.
Geomicrobiology of Clay Minerals: Implications for Life on Early Mars [#1444]

Clay-rich materials on Mars indicate areas where liquid water was once present and where life could have existed. If life did indeed exist on Mars at the time of their formation, these clay minerals may contain traces of past martian life.

Schieber J. Glamoclija M. Thaisen K.
Experiments on Fossilization of Iron Microbes — A Preliminary Report [#1626]

We tested preservation potential of iron microbes. In anoxic sulfidic environments the sheaths of filamentous iron microbes become encrusted with pyrite and have good preservation potential. Enclosure in growing halite crystals affords preservation with high morphological fidelity.

Walton A. W.
Formation, Modification, and Preservation of Microbial Endolithic Borings in Hyaloclastite from Hawaii: Clues for Petrographic Recognition of Microbial Traces in Basalt Glass of Any Provenance and Stage of Alteration [#1975]

Microorganisms that bore into basalt glass leave distinctive trace fossils that might be recognizable in basalt glass from any source where such organisms exist or once did. Borings in Hawaiian basalt glass may be a guide to such features.

Pócs T. Horvath A. Ganti T. Bérczi Sz. Kereszturi A. Sik A. Szathmary E.
Comparison of Surface Mineral Crusts and Cryptobiotic-Crusts: How Can They Help Life Support Mechanisms; Implications to Living Organisms on Mars [#1144]

We compare surface mineral crusts (SMC) and cryptobiotic crusts (CBC) occurring on the surface of the soil or rocks in various soil environment types of Earth in order to approach understanding their life support abilities and mechanisms on Mars.

Glamoclija M. Schieber J. Reimold W. U.

Microbial Signatures from Impact-induced Hydrothermal Settings of the Ries Crater, Germany; A Preliminary SEM Study [#1989]

Life signatures from hydrothermal impact induced environments. A preliminary SEM study, and Ti-related bacteriomorphs associated with zeolite clinoptilolite.

Harris R. S. Schultz P. H.

Impact Amber, Popcorn, and Pathology: The Biology of Impact Melt Breccias and Implications for Astrobiology [#2306]

We present evidence that superheated impact melts can trap and preserve both floral and faunal remains forming "impact amber." We discuss terrestrial occurrences of impact amber and the strategy it suggests in searching for evidence of past life on other planetary surfaces.

Miura Y.

Formations of Calcium-Carbonates by Natural and Artificial Shock Wave Impacts: New Type Formation of Carbonates [#1277]

Shocked calcium carbonates are formed by explosion in air with surface materials (including limestone and human body). These are found in artificial and natural impacts on limestone and melt fragments by Hiroshima A-bomb explosion.

Wilson R. C. Pearson V. K. Morgan G. H. Franchi I. A. Turner D. C. Wright I. P. Gilmour I.

Experimental Simulation of Volatile Organic Contributions to Planetary Atmospheres and Surfaces [#1799]

We present the results of a new simulation of the atmospheric entry heating experienced by extraterrestrial dust particles, quantifying their volatile loss into the early Earth atmosphere and characterising their organic volatile components.

Léveillé R. J. Datta S.

Basaltic Caves and Lava Tubes: Astrobiological Targets on Earth and Mars [#1446]

Cave minerals on Earth provide a record of aqueous processes and microbial activity. Caves, especially lava tubes, likely occur on Mars as well, and the minerals they contain may provide useful information on past aqueous activity and perhaps even martian life.

Schulze-Makuch D. Dohm J. Fairen A. Fink W. Fan C. Rodriguez A. Baker V.

Prioritizing Putative Hydrothermal Sites on Mars [#1735]

We assembled a list of martian sites that exhibit indications for endogenic- and exogenic-driven hydrothermal activity based on a set of selection criteria to aid in the prioritization of future target sites for Mars exploration.

Schulze-Makuch D. Houtkooper J. M.

Martian Extremophiles? — The H₂O₂-H₂O Hypothesis and Its Implications for the Mars Phoenix Mission [#1171]

The Mars Phoenix Mission will land in the northern latitudes where microbes might exist that adapted to the harsh martian conditions by employing a H₂O₂-H₂O-mixture as intercellular fluid. This mission provides a unique chance to detect life on Mars.

Houtkooper J. M. Schulze-Makuch D.

Detecting Life on Mars: Reanalysis of the Viking Life Detection Experiments and the Role of H₂O₂ as a Possible Biological Agent [#1187]

The results of the Viking Lander life detection experiments are not easily explainable. The hypothesis that organisms might use a mixture of H₂O₂ and H₂O in their intracellular fluid sheds new light on the absence of organics and the production of O₂.

Furfaro R. Dohm J. M. Fink W. Kargel J. S. Schulze-Makuch D. Fairén A. G. Ferre P. T.

Tarbell M. A. Hare T. M. Komatsu G. Palmero-Rodriguez A. J. Baker V. R. Miyamoto H.

Searching for Life on Extraterrestrial Bodies: Fuzzy Autonomous Systems for Planetary Reconnaissance [#1372]

A two-layer fuzzy-based system capable of autonomously assessing potential for life habitability has been designed. This system assumes that life is tied to water and energy availability and uses the fuzzy logic framework to search for prime locales of elevated life-containing habitability.