

Thematic Topics in 2005

A Preview

At our first inaugural meeting last April, we sifted through several pages of potential topics. Some had been suggested by the councils of the participating societies; others had been gathered at meetings, while talking to colleagues. We strived to choose topics that would be of interest to a wide part of our membership – in each of these issues, mineralogists, geochemists, and petrologists should find at least one article of great interest to them – but also topics where exciting developments are underway. We also needed to find guest editors and authors willing to work under very tight deadlines.

If you are interested in proposing a topic, you can download a proposal form from our web site. We are already developing themes for 2006 and 2007. Here is what you can look forward to in 2005.

The Editors

MARCH 2005

Diamonds

Diamond, the fascinating ultrahard mineral, is the focus of considerable interest and scientific research. Recent advances particularly relevant to geoscientists include: diamond as a recorder of Earth processes from the perspective of inclusions, chemistry, and conditions of formation; synthesis for research applications and processing to modify color and physical properties, important to diamond gems and anvils; the implications of nanodiamonds from meteorites.

Guest Editors: George E. Harlow and Rondi M. Davies, American Museum of Natural History

Inclusions in sublithospheric diamonds – unique samples from the deep mantle – Thomas Stachel (University of Alberta), Gerhard P. Brey (Universität Frankfurt), and Jeff W. Harris (University of Glasgow)

Ultrahigh-pressure (UHP) diamonds – Yoshihide Ogasawara (Waseda University)

Strange diamonds: unresolved origins of framesite and carbonado – Peter J. Heaney (Pennsylvania State University), Edward P. Vicenzi (Smithsonian Institution), and Subarnarekha De

High-pressure and high-temperature (HPHT) treatment of gem diamonds – James E. Shigley (Gemmological Institute)

Meteoritic nanodiamonds: messengers from the stars? – Gary R. Huss (University of Hawaii at Mānoa)

Advances in chemical vapor deposition (CVD) growth of diamond – Russell J. Hemley and coworkers (Geophysical Laboratory)

Origin and formation of diamonds in the Earth's mantle: a view from stable isotopes. – Pierre Cartigny (Institut de Physique du Globe de Paris)



Rounded diamond octahedron showing etch "trigons." 5.26 cts (8 mm across), Kimberley, South Africa. AMNH 91708

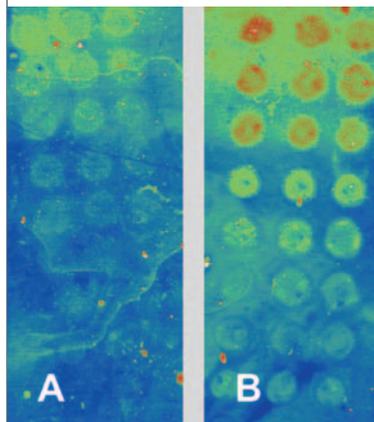
Photograph by George Harlow, American Museum of Natural History.

JUNE 2005

Genesis: Rocks, Minerals, and the Geochemical Origin of Life

In the beginning, Earth was a blasted, lifeless planet of water, air, and rock. From these raw materials, life emerged through a sequence of geochemical processes, including mineral-catalyzed organic synthesis, concentration of those molecules in mineral surfaces, and assembly of life's essential macromolecules.

Guest editor: Robert M. Hazen, Geophysical Laboratory



DNA microarray technology has been used to study the relative adsorption of L-lysine, a biological amino acid, onto (A) left- and (B) right-handed quartz (100) crystal faces. Lysine adsorbs more strongly onto right-handed quartz – a result that demonstrates the possible role of minerals in the origins of biochemical handedness. Eight rows of three 150-micron-diameter spots represent eight serial dilutions of a fluorescent-tagged lysine solution. Each spot was dried and washed; the strength of the fluorescence reveals concentration of adsorbed lysine.

Rocks and minerals as protective environments for life's origin – Joseph V. Smith (University of Chicago)

Minerals and the assembly of biopolymers – James P. Ferris (Rensselaer Polytechnic Institute)

The geochemical evolution of metabolism – George D. Cody (Geophysical Laboratory)

Clay minerals and the origins of life – A. Graham Cairns-Smith (University of Glasgow)

SEPTEMBER 2005

Toxic Metals in the Environment: The Role of Surfaces

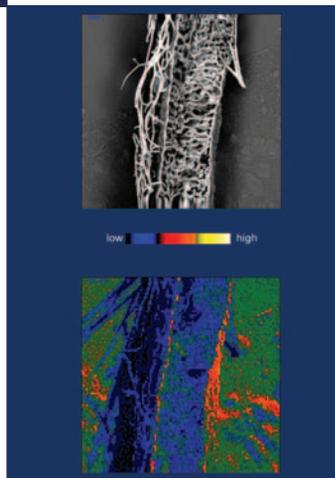
The fate, transport, and bioavailability of toxic metals in the environment are of major concern worldwide. Surfaces control such important processes as metal sorption, redox, and dissolution. This issue will explore some of the frontiers in understanding and predicting metal

reactions and mechanisms on natural surfaces. These phenomena will be explored at multiple scales, using novel analytical techniques.

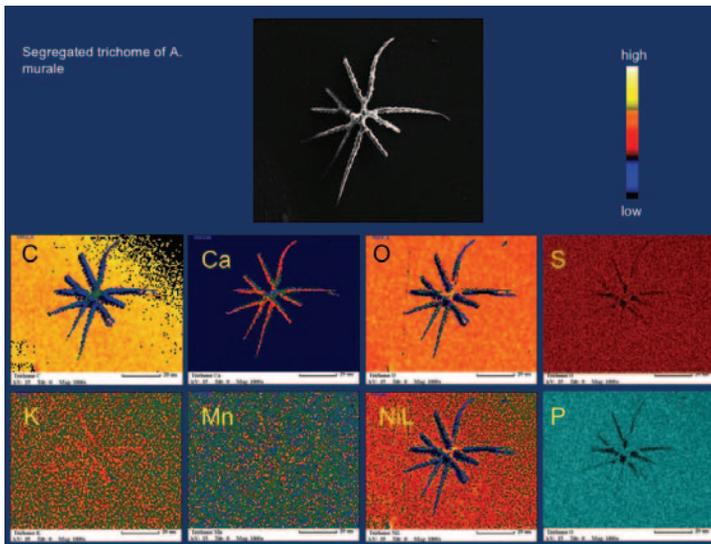
Guest Editor: Donald L. Sparks, University of Delaware

The use of synchrotron X-rays to investigate mineral-metal-microbe interactions and their impact on metal transformations – Ken Kemner (Argonne National Laboratory)

The importance of nanoparticles and their unusual properties in sediments and soils from heavy metal-contaminated sites – Michael F. Hochella Jr. and Andrew S. Madden (Virginia Tech)



SEM micrograph of a leaf cross section and the corresponding EDX map showing the Ni distribution.



Trace-metal sorption on biogenic manganese oxides – Garrison Spósito (University of California), Mario Villalobos (UNAM, México), and Brandy Toner (University of California)

Top image is an actual SEM micrograph of a trichome separated from the surface of an *Alyssum murale* leaf. Images below are EDX spectra showing the distribution of various elements.

Speciation of toxic metals on soil and plant surfaces using state-of-the-art synchrotron-based techniques – Donald L. Sparks, David H. McNear Jr, and Ryan Tappero (University of Delaware)

Metal retention and transport on particles in the environment – Ruben M. Kretzschmar (Institute of Terrestrial Ecology, Schlieren, Switzerland), and Thorsten Schäfer (Forschungszentrum Karlsruhe)

DECEMBER 2005

Large Igneous Provinces and Environmental Change

Large igneous provinces record major outpourings of igneous rocks, both on the continents and in ocean basins. Their origin is still vigorously disputed, with models invoking mantle plumes, thermal effects of the lithosphere, and meteorite impacts. The environmental consequences are also hotly debated: some argue that voluminous flood basalt volcanism triggered catastrophic changes in the global climate and mass extinctions, whereas others believe their effects much less significant.

Guest Editor: Andrew D. Saunders, University of Leicester

Large igneous provinces and mantle plumes – Ian A. Campbell (The Australian National University)

Large igneous provinces and lithospheric processes – Don L. Anderson (California Institute of Technology)

Large igneous provinces and impacts – Adrian P. Jones (University College London)

Environmental consequences of oceanic plateaus – Andrew C. Kerr (Cardiff University)

Flood basalt eruptions: gas fluxes and potential effects on global climate – Stephen Self (The Open University)

Large igneous provinces and mass extinctions – Paul Wignall (The University of Leeds)



Basalt mountains of the Blossville Coast, East Greenland, part of the Tertiary North Atlantic large igneous province.

Photo: Danish Lithosphere Project

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E-mail: info@excaliburmineral.com

BIOGEOSCIENCES.ORG LAUNCHES

An innovative new web site, www.biogeosciences.org, bridging the Earth and life sciences went online June 8, providing a single resource for all things related to biogeoscience. Biogeosciences.org is a natural home for biogeoscience discussions, resources, and promotion. The non-commercial web site, supported by a grant from the Biogeosciences Program of the National Science Foundation, draws from several partnered professional societies* and elsewhere to present an outstanding collection of biogeoscience resources for all levels of education and interest. The dynamic web site is expected to grow and change reflecting the trends in biogeoscience and usage needs. Basic biogeoscience links, background information, and program resources are available along with more detailed information on jobs, funding, and research opportunities. The new web site has comprehensive lists of degree and research programs, applicable journals and other publications, and a complete database of relevant conferences and meetings featuring special sections and associated symposia. A discussion forum allows for the rapid dissemination of ideas and opinions and addresses some of the most important issues facing biogeoscience today. Another interactive feature is an image gallery where pictures are exchanged freely for educational purposes. The growing collection of biogeoscientists is highlighted by interviews and information on what types of research biogeoscientists are presently working. Interviews with various program managers elicit the particulars of the funding process and provide insight into research funding decisions and important statistics.

Interested parties should contact Sarah Leibson, Biogeosciences.org Web Coordinator at web@biogeosciences.org, (303) 357-1095. Content-related suggestions or comments are warmly encouraged.

* American Geophysical Union, American Society of Limnology and Oceanography, European Geosciences Union, Ecological Society of America, Geochemical Society, Geological Society of America, Mineralogical Society of America, and the Soil Science Society of America