THE 237th ACS NATIONAL MEETING & EXPOSITION

Salt Lake City, UT

March 22-26, 2009

GEOC DIVISION NEWSLETTER

IN THIS ISSUE:

MESSAGE FROM THE PROGRAM CHAIR

Doug Kent, U. S. Geological Survey, Menlo Park, CA, USA

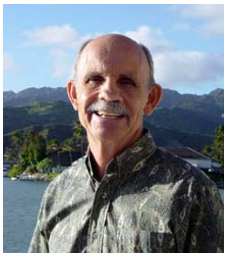
Thanks to the work of a dedicated set of symposium organizers, the Geochemistry Division will host an exciting program with over 200 presentations at the 237th ACS National Meeting, Salt Lake City, UT, March 22-26, 2009. Symposia will begin Sunday morning and end Thursday afternoon. The Geochemistry Division Medal will be awarded to Dr. Fred T. Mackenize in a special plenary symposium, which will be held Monday afternoon. In addition to the award symposium, there will be symposia to celebrate the careers of two of our distinguished colleagues: Dr. Frank Millero and Dr. James Leckie. All of the oral sessions will be held in the Hilton Hotel. Poster sessions (including the Sci-Mix) will be in the Salt Palace Convention Center, Hall 5.

Geochemical Division Social, Monday, 5:00-7:00 PM, Trofi North, Hilton Hotel.
Enjoy free food and drink with colleagues, friends, even a few enemies. After the awards symposium and before the Sci-Mix.

Sci-Mix Poster Session, Monday evening 8-10 PM, Salt Palace Convention Center.
The Sci-Mix will feature several Geochemistry Division Posters, along with posters from all other ACS divisions. The event follows the Geochemistry Division Social.

Geochemical Division Poster Session: Tuesday evening, 5-7 PM, Salt Palace Convention Center. *Don't miss the Division's stimulating poster session, which features more than 30 presentations from all of the symposia.*

Fifth Geochemistry Division Medal to be awarded to Dr. Fred T. Mackenzie



There will be a special, plenary symposium in honor of Dr. Mackenzie on Monday afternoon with presentations by Abe Lehrman, Eric DeCarlo, John Morse, and Fred Mackenzie. Frank Millero and George Luther will preside. The medal will be presented by American Chemical Society president elect Joseph Francisco. The title of Dr. Mackenzie's presentation: "500 million years of ocean-atmosphere-sediment evolution". The Geochemistry Division social will follow directly after the symposium. (more about Dr. Mackenzie under events and announcements)

Metal and Metalloid Speciation and Adsorption in Honor of James O. Leckie.

Jim Davis, Kim Hayes and several other former students of Dr. James O. Leckie have put together a special symposium in his honor. The symposium will run from Sunday morning through Wednesday afternoon and will feature presentations on characterization, modeling, and engineering applications related to chemical reactions at the mineral-water interface and other topics addressed during Dr. Leckie's distinguished career as a professor in the Civil Engineering Department at Stanford University.

Speciation and Kinetics in Natural Waters in Honor of Frank J. Millero

Virender Sharma has organized a special symposium in honor of Dr. Frank Millero, RSMAS, University of Miami. Among many other honors during the course of his distinguished career, Dr. Millero received the Geochemistry Division Medal in 2001. He is a former Chair of the GEOC Division and co-chaired the selection committee for this year's division award. The symposium will run all day Thursday and, as the title suggests, will focus on aquatic speciation and kinetics.

GEOC DIVISION TECHNICAL PROGRAM

Douglas B. Kent, Program Chair

Salt Palace Convention Center, Hilton	***Sun***	***Mon***	***Tue***	***Wed***	***Thu***
Metal and Metalloid Speciation and Adsorption in Honor of James O. Leckie** (ENVR)	*D*	*A*	*D*	*D*	
Molecular Computational Geochemistry for Water-Rock Interactions	*D*	*A*			
Coprecipitation of Metals during Chemically and Biologically Induced Mineral Precipitation	*D*				
Redox Biogeochemistry of Phyllosilicate Minerals** (ENVR)		*A*			
Geochemistry Division Award Symposium in honor of Fred T. Mackenzie		*P*			
Sci-Mix		*E*			
Poster Session (all symposia)			*E*		
Multiscale Reactions Including Fe-oxides, Oxyhydroxides, and Hydroxides			*D*	*D*	
Geochemical Processes, Reactivity, and Applications of Manganese Oxides** (ENVR and INOR)					*D*
Speciation and Kinetics in Natural Waters in Honor of Frank J. Millero					*D*

Legend

***A** = AM; **P** = PM; **D** = AM/PM; **E** = EVE; **DE** = AM/PM/EVE; **PE** = PM/EVE;*
** Cosponsored symposium, primary organizer(s) shown in parentheses; ** Primary organizer, cosponsoring organizer(s) shown in parentheses; .‡ Indicates a cooperative cosponsorship.*

Brief Overview of the GEOC Division Symposium

Coprecipitation of Metals during Chemically & Biologically Induced Mineral Precipitation

Yoshiko Fujita and Andreas Kaepler, organizers

The oral portion of the symposium runs all day Sunday and will feature presentations on theoretical, laboratory, and field studies of metal, metalloid, and carbon dioxide sequestration owing to precipitation reactions.

Molecular Computational Geochemistry for Water-Rock Interactions

Barry Bickmore and Kevin Rosso, organizers

The oral portion of this symposium runs from Sunday morning through Monday morning. Presentations will describe a wide range of applications of molecular modeling to understanding aquatic geochemical processes.

Redox Biogeochemistry of Phyllosilicate Minerals

Evgenya Shelobolina and Eric Roden, organizers

The oral portion of this symposium will be on Monday morning. Presentations will address microbial redox reactions involving Fe-bearing phyllosilicate minerals, which are widespread in low-temperature sedimentary systems.

Multiscale Reactions Including Fe-oxides, Oxyhydroxides, and Hydroxides

Young-Shin Jun and Jim Kubicki, organizers

The oral portion of the symposium will run from Tuesday morning through Wednesday afternoon. Presentations will address a wide range of topics, including thermodynamics, nucleation and growth, structural characterization of bulk and surface structures, and interfacial electron transfer reactions relevant to a variety of geochemically important iron oxide and oxyhydroxide minerals.

Geochemical Processes, Reactivity, and Applications of Manganese Oxides

Mario Villalobos and John Bargar, organizers

The oral portion of the symposium will run all day Thursday. Presentations will address genesis, reactivity, and some exciting new technological applications of manganese oxides, which are perhaps nature's most important mineral-phase redox catalysts.

OUTGOING GEOC DIVISION CHAIR'S MESSAGE

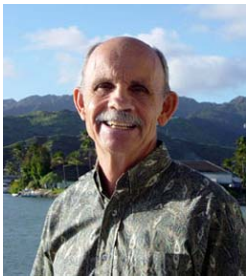
Tim Filley, Purdue University

I am looking forward to our gathering in Salt Lake City for the Spring 2009 meeting which will certainly be another excellently programmed event by our current Program Chair Doug Kent. Thank you Doug! In addition to sharing our science this year we come to honor one of our premier geochemists Fred Mackenzie with the Geochemistry Medal. Additionally, it is our great honor to be joined at our reception by the ACS President Elect Prof. Joe Francisco of Purdue University- an atmospheric chemist who works on numerous Earth Systems related issues. He will be presenting the Geochemistry Medal to Fred. I think we are all pleased to see a scientist who is prolific in the Earth Sciences as the next president.

The Geochemistry Division is able to consistently serve a broad geochemical scientific community because of the hard work of many dedicated volunteers in both elected and nonelected positions. I want to thank the Doug Kent for his hard work as Program Chair and welcome Lynn Katz in her new role in

that capacity. We have a new set of faces, as well as some returning "old" faces, in the executive committee after our 2009 elections. I want to welcome Jay Brandes, Skidaway Oceanographic Institution, as Program Chair Elect. Results of this last election place Ken Anderson and George Luther as continuing their roles and Councilor and Alternate Councilor. Thank you gentleman for your years of dedicated service. Newly elected to the position of Secretary is Lisa Stillings, U.S. Geological Survey, who takes over for the hardest working person of us all, Louise Criscenti. I want to thank all of those who ran for positions this year and encourage you to continue your involvement in the Division. Bios of each of our newly elected officers can be found in a later section of the Newsletter.

EVENTS AND ANNOUNCEMENTS



Fifth Geochemistry Division Medal to be awarded to Dr. Fred T. Mackenzie.

Excerpt by Frank J. Millero, PhD, Professor of Marine and Physical Chemistry University of Miami, RSMAS
fmillero@rsmas.miami.edu

Fred T. Mackenzie will be awarded the ACS Geochemistry Division Medal at the 237th ACS National Meeting and Exposition, March 22-26, 2009 in Salt Lake City, UT. The biennial award is for his outstanding accomplishments in geochemistry. For the last ~45 years, Mackenzie has been a central figure in the study of elemental cycling at the Earth's surface, with a particular emphasis on the role of sediments across a vast range of timescales. His numerous contributions have been consistently insightful, stimulating, and excellent, so much so that one has a tendency to simply take those unusual qualities for granted. Mackenzie, together with his myriad students and other colleagues, has produced a unique and intriguing combination of detailed experimental and field studies, typically carried out and synthesized within grand conceptual themes of elemental cycling and evolution of the Earth's surface. The intellectual mix of his research efforts includes carbonates, aluminosilicates, major and minor element cycles, global biogeochemical cycling, sedimentary cycles over geologic time, and the study of recent anthropogenic effects on carbon / nutrient cycling and their implications for global society.

Mackenzie's earlier contributions with Garrels on the concept of rapid reverse weathering in the ocean was particularly compelling, but was largely discounted at that time by the general geochemical community based on findings from a few initial studies. Subsequent recognition and quantification of hydrothermal processes in the 70's placed low temperature reverse weathering concepts and their necessity for explaining elemental balances on a distant backburner. His work on marine sediments continued to indicate that rapid, low temperature reverse weathering was a viable concept, but little interest was generated. It has now become abundantly clear from studies in deltaic sediments and, in particular, tropical mobile mud belts, that authigenic clay formation occurs extremely rapidly (months, years) as disseminated minor components in these massive sedimentary systems. Studies of Ge and Si in deep sea sediments also demonstrated early diagenetic authigenic mineral sinks consistent with rapid clay formation. The reverse weathering hypothesis of Mackenzie and Garrels, at times a subject of some derision, has been largely vindicated as a significant component of low temperature elemental cycles.

In recent decades, Mackenzie has become interested in undergraduate education in the environmental sciences. Mackenzie is indeed a rare individual in academia: a thoroughly talented mentor who understands the link between research and pedagogy, and deserves high recognition for both his science and for the profound role he has played in his students, intellectual and professional development.

Brief Biography: *After receiving his PhD in 1962 from Lehigh University, Mackenzie served as Geochemist and Assistant Director of the Bermuda Biological Station for Research (BBSR, now the Bermuda Institute of Ocean Sciences), and joined the faculty of the Department of Geological Sciences of Northwestern University in 1965. Mackenzie served on the faculty at Northwestern until 1981 (including seven years as chair), and then left to join the University of Hawaii at Manoa, where he has remained until the present date. He is currently Professor of Oceanography and Geology & Geophysics in the School of Ocean and Earth Science (SOEST). During his career at Northwestern University and the University of Hawaii, Mackenzie has supervised more than 12 MS theses and 30 PhD dissertations; virtually all of these students have gone on to successful teaching and research careers in academia, government, and industry. He currently directs the research of two graduate students and three post-doctoral researchers, and his current projects include modeling of the Earth surface system through geologic time, biogeochemical cycling of carbon, nitrogen, and phosphorous in the coastal zone, the effects of rising CO_2 and temperature on shallow water ecosystems, kinetics and thermodynamics of mineral-solution reactions, and implications of global warming for the concept of sustainability for Hawaii and island nations in the Pacific.*

Fred has received a large number of research and teaching awards during his career. His research awards include the Francqui International Medal of Science from the Universit_e Libre de Bruxelles, a Wissenschaftskolleg Fellowship from the Advanced Studies Institute in Berlin, Citation for Outstanding Accomplishments in the Field of Atmospheric Chemistry from The Electrochemical Society, the M. W. Haas Medal from the Department of Geology at the University of Kansas, the First Michael T. Halbouty Chair and Medal from Texas A&M University, the 2003 Distinguished Research Scientist Award from the Hawaii Academy of Science, the 1995 Hawaii Scientist of the Year Award from Achievement Rewards for College Scientists (ARCS), the Society for Sedimentary Geology 2005 Francis J. Pettijohn Medal Award for Excellence in Sedimentology, the 2006 Claire C. Patterson Medal Award in Environmental Geo-chemistry of the Geochemical Society, the current William Deering Visiting Chair in the Department of Geological Sciences from Northwestern University, and the Regents' Medal for Excellence in Research from the University of Hawaii. In 2007, he received the Vernadsky Medal from the International Association of Geochemistry (IAGC).

Mackenzie has authored or co-authored more than 230 scholarly publications and has written or edited fifteen books/volumes. His many other papers in Science, Nature and other first rank journals in our field are a testament to the value placed on Mackenzie's contributions by the scientific community.

Volunteers Needed to Judge Student Posters at the Spring 2009 Meeting In SLC: *The Geochemistry Division will award several undergraduate students participating in the undergraduate student poster session will be given awards. We need a cadre of volunteers to comb through the posters to find some high-quality posters with a geochemical component. Winners receive a one-year membership in the Division, a certificate, and a check for $25. Please contact Doug Kent (dbkent@usgs.gov) for more information.*

Interested in Planning Symposia for Future ACS Meetings?

Future ACS meetings

Fall 2009: August 16-20, 2009; Washington, D.C.

Spring 2010: March 21-25, 2010, San Francisco, California

Fall 2010: August 22-26, 2010, Boston, Massachusetts

Spring 2011: March 27-31, 2011, Anaheim, California

Fall 2011: August 28 - September 1, 2011, Denver, Colorado

Have an idea for a symposium you would like to see at a future American Chemical Society meeting? Please let us know! Whether just starting your career or a seasoned veteran in your field, here is your opportunity (as Matt Ginder-Vogel put it) to organize the symposium you always wanted to attend! The division provides both flexibility and some financial support. Below are the contact information for program chairs for the next four meetings (after SLC):

Fall 2009 and Spring 2010

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Fall 2010 and Spring 2011

Jay Brandes
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Please feel free to contact any of us, including the recent program chairs, if you would to kick around ideas or ask questions. The two most recent program chairs are:

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THE 238th ACS NATIONAL MEETING, GEOCHEMISTRY DIVISION

Washington, DC
August 16-20, 2009

Call for Papers 

The Geochemistry Division has organized the following topical oral symposia, consisting of both invited and contributed papers, and also topical and general poster sessions. ***Abstract submission deadline has been extended to March 30, 2009.*** *For those interested, please submit abstracts to the appropriate symposium at* http://oasys.acs.org/oasys.htm.

The Impact of NOM on the Biogeochemistry of Emerging Contaminants. *The fate of emerging organic contaminants e.g., pharmaceuticals, personal care products, fire retardants, etc. in aquatic environments is not well understood, but it has become increasingly evident that natural organic matter (NOM) plays an important role. For example NOM is known to facilitate the transformation of many organic compounds in photochemical reactions by acting as photosensitizers and as electron shuttles in reduction processes. Conversely, NOM may also retard the degradation of these contaminants by screening out UV radiation in the water column and shielding them form reactive substances. This symposium will highlight research that examines the role of NOM in mediating or retarding the transformation of emerging contaminants. We seek talks and posters on how NOM affects photochemical reactions, redox processes, and biotransformations in both natural and engineered systems. For more information: Yu-Ping Chin,* The Ohio State University*, yo@geology.ohio-state.edu*

Availability and Mobility of Metals in Sediments. *This session is focused on relating the bulk solid concentrations of metals in contaminated sediments to the risks they pose. Metals in insoluble forms are largely immobile and have been found to pose little risk to benthic and higher organisms. Dynamic processes that might destabilize unavailable forms of metals include ingestion and processing of sediments by benthic deposit feeders, diurnal or other variations in salinity, redox and pH coupled with hyporheic zone transport, and erosion and resuspension of the surficial sediments. Acid volatile sulfides and solid phase organic matter have been used to indicate the presence of metals in unavailable forms. Papers examining the relationship between these and other indicators of metal availability and mobility are sought. Papers on the measurement, interpretation or modeling of dynamic processes and their influence on metal availability and mobility are also sought. For more information: Danny Reible,* The University of Texas at Austin, *reible@mail.utexas.edu*

Biogeochemical Processes of Mercury in Natural and Contaminated Environments. *This symposium jointly organized with the Division of Environmental Chemistry, seeks further understanding of both molecular- and field-scale biogeochemical processes that control the transformation, transport, and bioavailability of mercury (Hg) in soil and aquatic environments.*

Emphasis will be placed on Hg redox reactions, speciation, biological or abiotic methylation and demethylation processes influenced by interactions of mercury with aqueous compounds, natural dissolved and particulate organic matter (DOM and POM), biota, colloidal materials, and sunlight. We invite papers related to 1) molecular- to field-scale understanding of the biogeochemical processes influencing Hg speciation and bioaccumulation, 2) interactions of Hg with DOM/POM and sediments, 3) biological processes and genetic basis of Hg methylation and demethylation, 4) photochemical and catalyzed redox reactions, 5) Hg transport, global and industrial point-source related cycling and models, and 6) innovative remedial concepts at contaminated sites. We hope that the symposium serves as a forum for presentation and discussion of advances in broad scientific fields on mercury-related research and environmental remediation with a focus on molecular- to field-scale understanding at contaminated sites. Cosponsored by Division of Environmental Chemistry. For more information: Scott Brooks and Baohua Gu, Oak Ridge National Laboratory, *brookssc@ornl.gov or gub1@ornl.gov,* Hong Zhang, Tennesee Tech. Univ., *hzhang@tntech.edu or E. Erin Mack,* Dupont Corporate Remediation, *elizabeth-erin.mack@usa.dupont.com.*

Astrochemistry: Chemistry of Planets, Interstellar Dust and Beyond. *Astrochemistry, an interdisciplinary field that covers both astronomy and chemistry, is the study of abundance and reaction of chemical elements and molecules in Solar System and interstellar medium, and their interactions with radiation. Some of the molecules detected in space, such as hydrogen, carbon monoxide, ammonia and water are also present on Earth, while others do not exist on our planet. Formaldehyde is the first polyatomic molecule detected in space. Recent advances in instrumentation and development of more sensitive techniques allowed scientists to search for more complex, carbon-rich molecules and investigate the mechanisms for their formation. The goal is to achieve a full understanding of molecular evolution and to shed light on a long debated puzzle, that is whether the precursor molecules required for the origin of life formed in space and have been delivered to Earth via comets, meteorites and interplanetary dust particles, or evolved on our planet. The symposium aims to bring together scientists from the fields of astronomy, chemistry and physics, who have been investigating the occurrence, formation and structure of molecules in Solar System and interstellar medium to present and discuss their fascinating results. For more information: Gozen Ertem, Space Science Division NASA, gozen1ertem@gmail.com.*

General Geochemistry (Oral and Posters). *For more information: Lynn Katz, University of Texas, lynnkatz@mail.utexas.edu*

Geochemistry Division to Cosponsor Undergraduate Student Poster Session

Beginning at the Fall 2009 meeting in Washington DC, the Geochemistry Division will cosponsor the undergraduate student poster session with the Division of Chemical Education. Please encourage your undergraduate research students to submit a poster and participate in this session. Enter abstracts through the Division of Chemical Education (CHED) portal in ***OASYS****.*

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