ACS Chemistry for Life®

ACS Technical Division
Geochemistry (GEOC)

Call for Abstracts for Fall 2024 National Meeting

Denver, CO, August 18–22, 2024
Abstract Submission Deadline: Monday, April 1, 2024

https://callforabstracts.acs.org/acsfall2024

Advances in Environmental Electro-Analytical Chemistry: A Symposium Honoring the Career of George Luther

Organizers: Yu-Ping Chin (University of Delaware, yochin@udel.edu), Martial Taillefert (Georgia Institute of Technology, mtaillef@eas.gatech.edu), Virender K. Sharma (Texas A&M School of Public Health, vsharma@tamu.edu), Brian Glazer (University of Hawaii at Manoa, glazer@hawaii.edu), Greg Druschel (Indiana University–Purdue University Indianapolis, gdrusche@iupui.edu), Andrew Wozniak (University of Delaware, awozniak@udel.edu)

Cosponsor: ENVR

This symposium will honor the numerous contributions and advances to aquatic and marine chemistry that George Luther has made over the course of his long career. Dr. Luther's innovative analytical strategies including voltammetry and other electrochemical methods has greatly advanced our understanding of environmental and geochemical processes ranging from metal-dissolved organic matter speciation to redox processes in stratified water columns, sediments, and hydrothermal vents. Abstracts related to topics Dr. Luther has studied throughout his career are welcomed. Topics that will be covered include (but are not limited to) metal-ligand interactions, redox processes in marine and freshwater pelagic and benthic systems, deep sea environments including hydrothermal vents, advances in the application and development of electrochemical analytical approaches and applying theoretical calculations to characterize electron-transfer reactions.

ACS Chemistry for Life®

ACS Technical Division
Geochemistry (GEOC)

Call for Abstracts for Fall 2024 National Meeting

Denver, CO, August 18–22, 2024
Abstract Submission Deadline: Monday, April 1, 2024

https://callforabstracts.acs.org/acsfall2024

Geochemistry and Environmental Chemistry at the Water–Energy Nexus

Organizers: Young-Shin Jun (Washington University in St. Louis, ysjun@wustl.edu), Taeyoung Kim (Clarkson University, tkim@clarkson.edu), Sang Soo Lee (Argonne National Laboratory, sslee@anl.gov), Tiezheng Tong (Colorado State University, Tiezheng.Tong@colostate.edu)

Cosponsor: I&EC, ENVR, ENFL, COMSCI, CEI

The strong interdependence of water and energy controls the sustainability of our environment. Geochemistry powerfully illuminates this intricate relationship, providing critical insights into the impacts of energy extraction, storage, and consumption on aquatic ecosystems. Such detailed knowledge also enables designing and maintaining energy-efficient and high-performance water treatment and distribution systems. This session will highlight joint studies of physical, (bio)chemical, and environmental processes in the application and management of the water-energy nexus, including but not limited to

- Aqueous and interfacial chemistry for energy extraction, production, and storage
- Brine management chemistry for energy and water production
- Chemistry that enables sustainable water treatment, distribution, and disposal
- Advanced characterizations and designs of interfacial structures of energy and water systems
- Recovery of nutrients, critical elements, and resources via adsorption, incorporation, and mineralization
- Chemistry for carbon management
- Chemistry that promotes treatments and upcycling of byproducts from water and energy systems

Presentations of new results from laboratory-scale experiments, theoretical and computational study, and development and application of advanced techniques are encouraged.

ACS Chemistry for Life®

ACS Technical Division
Geochemistry (GEOC)

Call for Abstracts for Fall 2024 National Meeting

Denver, CO, August 18–22, 2024
Abstract Submission Deadline: Monday, April 1, 2024

https://callforabstracts.acs.org/acsfall2024

Interfacial Geochemistry of Layered Minerals

Organizers: Tuan Ho (Sandia National Laboratories, taho@sandia.gov), Ke Yuan (Oak Ridge National Laboratory, yuank@ornl.gov), Jacquelyn Bracco (Queens College, CUNY, Jacquelyn.Bracco@qc.cuny.edu), Anastasia Ilgen (Sandia National Laboratories, agilgen@sandia.gov)

Cosponsor: ENVR, COLL

This symposium focuses on reactions and chemical species transport through the interlayers, at the basal surfaces or at edge site of clay minerals and other layered 2D geomaterials. The phenomena of interest include but not limited to intercalation of water, gases, ions, and organic molecules within the interlayer spaces, swelling/shrinking of layered materials, physical and chemical alterations of fluids confined within interlayers of 2D minerals, chemical transformations at the mineral-water interfaces, and stacking of layered materials. The symposium also focuses on the advancement in experimental and simulation techniques for understanding chemical phenomena in 2D minerals, including clay materials and other layered materials. This session seeks to highlight how recent advances in experimental and computational methods have shaped our current understanding of layered minerals and identify future advances that are needed to further develop this field.

ACS Chemistry for Life®

ACS Technical Division
Geochemistry (GEOC)

Call for Abstracts for Fall 2024 National Meeting

Denver, CO, August 18–22, 2024
Abstract Submission Deadline: Monday, April 1, 2024

https://callforabstracts.acs.org/acsfall2024

Mineral Crystallization, Aggregation, and Dissolution

Organizers: Xin Zhang (Pacific Northwest National Laboratory, Xin.zhang@pnnl.gov), Xiaofeng Guo (Washington State University, x.guo@wsu.edu)

Cosponsor: PHYS, ENVR

Mineral crystallization, aggregation, and dissolution represent crucial research domains spanning geochemistry, materials science, environmental engineering, and biomedicine. A comprehensive understanding of the mechanisms behind these processes is essential for designing and developing novel materials, as well as predicting and controlling mineral formation in both environmental and industrial contexts. For instance, unraveling the crystallization, aggregation, and dissolution of iron (oxyhydr)oxide minerals in natural environments is of enduring interest due to its impact on regulating global biogeochemical cycles of various elements such as C, O, N, and S. The fast-paced growth of this field brings forth a challenge — the need to establish a fundamental understanding of interactions among ions, molecules, complexes, clusters, and/or nanoparticles in a growth medium, and the resulting response dynamics. This session aims to address this challenge by highlighting contributions related to: 1) dynamic changes of nanomineral reactivity throughout nucleation, crystal growth, aggregation, and dissolution; 2) the influence of additives on mineral crystallization, aggregation, and dissolution; 3) computational modeling and simulation of mineral crystallization, aggregation, and dissolution; 4) in-situ observation of mineral crystallization, aggregation, and dissolution; 5) crystallization pathways in biomineralization; and 6) thermodynamic and kinetic parameters controlling mineral formation, alteration, and dissolution.

The objective of this session is to create a platform for interdisciplinary researchers from geology, chemistry, physics, biology, computational chemistry, and materials sciences to share their knowledge and approaches. This collaborative effort aims to enhance our understanding of mineral crystallization, aggregation, and dissolution, providing new insights into biogeochemical processes in nature and facilitating the design of novel functionalized materials.

The topics that would be covered in this session are, but are not limited to:

- Mineral nucleation and crystal growth
- Particle-based crystallization
- Self-assembly of nanominerals
- *in situ* observation of the mineral crystallization, aggregation, and dissolution
- Thermodynamic modeling and measurements in geochemistry
- Biomineralization
- Mineral dissolution
- Computational modeling and simulation on the mineral crystallization, aggregation, and dissolution

ACS Chemistry for Life®

ACS Technical Division
Geochemistry (GEOC)

Call for Abstracts for Fall 2024 National Meeting

Denver, CO, August 18–22, 2024
Abstract Submission Deadline: Monday, April 1, 2024

https://callforabstracts.acs.org/acsfall2024

Reactivity at the Mineral-Water Interface: Validation Through Modeling and Experiments at the Pore Scale

Organizers: Vitalii Starchenko (Oak Ridge National Laboratory, starchenkov@ornl.gov), Anna Herring (University of Tennessee-Knoxville, aherri18@utk.edu)

Cosponsor: ENVR, ENFL

Recent developments in experimental and modeling techniques have had a huge impact on geoscience research. High flux neutron and X-ray sources enable in-situ observations of nonequilibrium processes such as phase transformations on flat surfaces and in complex porous matrices. Large scale molecular simulations and highly resolved pore scale simulations give us an unprecedented ability to quantitatively test hypotheses regarding processes at the mineral-water interface. However, the connection between experiments and simulations remains an important challenge for geoscientists. In part, this is due to the large range scales associated with these processes and the heterogeneity of geomaterials.

This session focuses on how the data from experimental and modeling studies can be successfully utilized for testing hypothesis and validating theories. In particular, how experimental observations can validate modeling techniques, indicate novel unconsidered phenomena, and help to understand complex chemical mechanisms occurring on mineral surfaces. We are specifically interested in contributions that incorporate modeling or experiments at the pore scale. Studies that use molecular-scale-derived understanding of mineral and liquid solution properties to fill the knowledge gaps in pore-scale studies are also encouraged. We welcome submissions that combine characterization, experimental, data processing, and modeling methods to explain mineral reactivity in CO_2 storage and transformation, contaminant remediation, underground hydrogen storage, and other subsurface geochemical applications.

ACS Chemistry for Life®

ACS Technical Division
Geochemistry (GEOC)

Call for Abstracts for Fall 2024 National Meeting

Denver, CO, August 18–22, 2024
Abstract Submission Deadline: Monday, April 1, 2024

https://callforabstracts.acs.org/acsfall2024

The Role of Mineral-Water Interfaces in Carbon Mineralization and Critical Mineral Recovery

Organizers: Emily Nienhuis (Pacific Northwest National Laboratory, emily.nienhuis@pnnl.gov), Allie Nagurney (Pacific Northwest National Laboratory, allie.nagurney@pnnl.gov)

Cosponsor: ENVR

Carbon mineralization in reactive reservoirs (i.e. basalt, peridotite) is being explored for permanently sequestering CO_2 through mineralization. Commercial scale subsurface sequestration requires a Class VI well permit. Acquisitions of a Class VI permit requires reservoirs benchmarked and parameterized by field- and laboratory-derived data, enabling accurate predictions of the fate and transport of the injected CO_2. This data includes temperature- and pressure-dependent kinetics of mineral dissolution, secondary mineral crystallization, and secondary mineral identity. Subsurface injection and mineralization of CO_2 is additionally being explored as an aid in critical mineral release and recovery. This session is motivated by the need to assess the state of science in understanding the complex and key processes occurring at mineral-water interfaces within the applied context of carbon mineralization and critical mineral recovery. Contributions are invited that highlight the fundamental and applied geochemistry at the mineral-water interface as it relates to mineral dissolution, precipitation, carbon mineralization, and critical mineral recovery, as well as emerging experimental techniques to understand these processes. We encourage submissions that utilize bench scale experiments, molecular simulations, and reactive transport models.

ACS Chemistry for Life®

ACS Technical Division
Geochemistry (GEOC)

Call for Abstracts for Fall 2024 National Meeting

Denver, CO, August 18–22, 2024
Abstract Submission Deadline: Monday, April 1, 2024

https://callforabstracts.acs.org/acsfall2024

General Geochemistry

Organizer: Sang Soo Lee (Argonne National Laboratory, sslee@anl.gov)

Cosponsor: n/a

This session is open to any papers related to the broad field of geochemistry. We are especially looking for presentations in areas that broaden our division both in terms of the composition and diversity of the membership as well as the breadth of topics explored. In addition, we are seeking presentations that address teaching pedagogy and novel approaches to engaging students at all levels.