

Geochemistry Division Symposia

256th American Chemical Society National Meeting & Exposition

August 19 – 23, 2018 Boston, MA

Submit your abstract now, abstract submission will close March 26th , 2017

- **Interfacial Chemistry under Nano-scale Confinement**
- **Visualizing Heavy Element Contamination in the Environment at the Nanoscale**
- **Surface chemistry and properties of nanoscale materials**
- **Molecular Understanding of the Structure and Reactivity of Mineral-Water Interfaces**
- **Mechanistic understanding of mineral growth and dissolution**
- **Microbial, chemical processes and advanced nanotechnology for contaminated site remediation**
- **General Geochemistry**

+ 3 student travel awards (3 awarded for Fall meetings)



CALL FOR PAPERS

Interfacial Chemistry under Nano-scale Confinement

256th American Chemical Society National Meeting & Exposition

Boston, Massachusetts, August 19-23, 2018

Co-sponsored by Division of Colloid and Surface Chemistry, and Division of Environmental Chemistry

Abstract submission deadline: March 26th, 2018

Nano-scale confinement has significant effects on interfacial chemistry of natural and engineered systems. In geochemistry, nano-scale confined domains (e.g., nanopores) are prevalent in geologic media, such as shale, coal, kerogen, and other compacted fine-grained materials. Minerals themselves can contain nanoporous domains, including clay mineral interlayers or cages in zeolites. Many fundamental physico-chemical properties of fluids, including density, surface tension and viscosity, are altered under nano-scale confinement, which affects the properties of dissolved chemical species and subsequent reaction pathways and products. Thus, interfacial chemistry under nano-scale confinement becomes a new frontier for geoscience. In addition, an advanced understanding of chemistry under nano-scale confinement can benefit the development of novel materials for energy storage and environmental and biomedical applications. At this exciting time, to share and understand findings from the community, we invite contributions on mineral-fluid interfacial chemistry, solute transport in nanopores, nano-scale confinement effects on electron transfer, and coupled chemical-mechanical effects arising from interfacial chemistry under nano-scale confinement at fracture tips.

We welcome experimental, modeling, and field investigations, spanning scales from molecular to field, as well as studies highlighting recent advances in computational and experimental techniques that provide new ways to interrogate nano-scale phenomena.

Please submit your abstracts using the ACS Meeting Abstracts Programming System (MAPS) at <https://maps.acs.org>. General information about the conference can be found at <https://callforpapers.acs.org/boston2018/GEOC>

Any other inquiries should be directed to the symposium organizers:

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**Visualizing Heavy Element Contamination in the
Environment at the Nanoscale**

256th ACS National Meeting & Exposition
Boston, August 19-23, 2018

Abstract submission deadline: March 26th, 2018

Recent advances in microscopy and spectroscopy both in terms of spatial resolution, sensitivity, and the ability to perform in-situ chemistry experiments, present enormous opportunities to the study of heavy metal contaminants, including lead, uranium, and radionuclides in the environment. Developments in in-situ monitoring of interfacial chemical processes, oxidation state changes, as well as advances in 3D tomographic imaging, offer the potential to illuminate new process schemes that could dramatically improve predictions and clean-up strategies.

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

- Heavy element sorption
- New methods for visualizing
- Computational tools
- Radionuclide transport and modeling
- Alteration of heavy element bearing phases

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General information about the conference can be found at

www.acs.org/meetings

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Surface Chemistry and Properties of Materials at the Nanoscale

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Abstract submission deadline: March 26th, 2018

The characteristics of a material's surface are important in determining what kinds of chemical and physical processes will occur there and how. At the nanoscale, the surface areas of solid materials increase dramatically, and the surface is chemically more active due to unsaturated bonding. Nano-scale materials expose more side and corner positions, and are inclined to generate more defects when compared with bulk materials of the same type. These features have already created wide applications for nanomaterials in research and industry, such as gas adsorption/separation, trace sample enrichment, photonic analysis, catalysis, tissue engineering, etc. In recent years, developing controllable synthesis of materials with various compositions, well-controlled size, finely tuned facet exposure, and high or low defect density has been one of the most important routes to discover novel materials. In addition, the rapid development of material preparation techniques and applications pose great challenges to scientists to rationalize their design and observation. Progress in this regard will require a combination of efforts to apply multi-spectrum, thermodynamic and computational simulation techniques. A better and more solid understanding of the chemistry and physics of material surfaces at the nanoscale will benefit the development and rational design of novel materials for energy, environmental and biomedical applications. At this exciting time, in order to share progress from within the community, we invite contributions regarding chemical processes on the mineral surface with regard to size, morphology and modification effects on surface properties at the nanoscale. We welcome both experimental and computational investigations, spanning the range from mechanisms to applications.

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

- Modeling
- Thermodynamics
- Mechanisms
- Applications
- Properties

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CALL FOR PAPERS

**Molecular Understanding of the Structure and
Reactivity of Environmental Interfaces**

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Boston, August 19-23, 2018

Abstract submission deadline: March 26th, 2018

Geochemical processes at mineral–water interfaces play a critical role in determining contaminant transport and nutrient availability in natural environments. Understanding these processes requires characterization of interfacial reactions at the molecular-scale. This session will highlight recent experimental and computation research on the structure and reactivity of geochemical interfaces covering from well-characterized single-crystal surfaces to complex environmental materials.

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

- Mineral surface structure and chemistry
- Surface mediated redox reactions
- Ion adsorption/desorption thermodynamics and kinetics
- Recent advances in computational and experimental design in interfacial chemistry

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

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CALL FOR PAPERS

Mechanistic understanding of mineral growth and dissolution

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Abstract submission deadline: March 26th, 2018

The growth and dissolution of minerals have far-reaching environmental impacts. For instance, these processes can affect the fate and transport of (harmful) metals as well as alter the chemical and isotopic composition of critical elements used as proxies to reconstruct past geochemical environments. This symposium will cover abiotic and biotic mechanisms controlling mineral growth and dissolution and their implications in understanding the biogeochemical cycling of elements and nutrients. Both experimental and modelling contributions are welcome.

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

- Nucleation and growth
- Reaction rates and energetics
- Atom/isotope exchange during recrystallization reactions
- Phase transformation and mineral replacement through dissolution/re-precipitation
- Crystal growth in confinement (droplet, microfluidic, etc.)
- Surface structure and reactivity control on growth/dissolution

Confirmed invited speakers (more to come):

Derk Joester, Northwestern University

Ling Li, Virginia Tech

F. Marc Michel, Virginia Tech

R. Lee Penn, University of Minnesota

H. Henry Teng, George Washington University

Adam Wallace, University of Delaware

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CALL FOR PAPERS

**Microbial, chemical processes and advanced nanotechnology
for contaminated site remediation**

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Boston, August 19-23, 2018

Abstract submission deadline: March 26th, 2018

Contamination of ecosystem with numerous organic and/or inorganic pollutants is a global issue that consumes considerable economic resources of industries and governments alike. Billions of dollars each year are spent for the remediation of contaminated sites in the United States alone. The fate of contaminants in the environment is highly influenced by complex microbial and chemical processes. The basic understanding of these complex interactions can provide us the knowledge to design and optimize the remediation strategies and therefore, improve science-based decision making for site management, priority-setting, and remedy selection. This session presents a forum to share recent advances in our understanding of the microbial and chemical processes affecting the fate, transport, and remediation of subsurface contaminants. The aim of this session is to collect the experimental, modeling and remedial contributions to understand microbial metabolism, chemical processes and pollutant transport in the natural systems, although we do not put a limit only to natural environment. New applications and approaches used to quantify and enhance remediation performance or develop closure strategies are appropriate. Particularly, contributions addressing the emerging applications of nanotechnology for environmental preservation for pollution prevention, contaminant treatment, and hazardous waste site cleanup in light of new discoveries are welcome.

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

- Understanding the microbial and chemical interactions with the inorganic and organic contaminants in environment, and their influential role in remediation
- *in-situ* and *ex-situ* remedial approaches for decontamination of metals and organic contaminants at the contaminated sites
- Advanced remedial approaches such as utilization of biochar in contaminant management in the environment, and their mechanisms of interactions.
- Application of these processes to develop remedial technologies for decontamination of inorganic and organic contaminants at the contaminated sites
- New advancements and improvements in nanoscale particles for the environmental applications
- Nanobased materials, such as nanoadsorbents, nanometals, nanomembranes, and photocatalysts for pollutant cleanup

Invited Speakers:

- Prof. Michael Komárek, Czech University of Life Sciences Prague, Czech Republic.

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