Aquatic Chemistry: Symposium in honor of Professor Alan T. Stone
Interfaces of Organic, Inorganic & Surface Chemistry in Natural & Engineered Systems

B. Deng, T. J. Strathmann, D. Vasudevan, Organizers
C. Huang, Organizer, Presiding

8:30 Introductory Remarks.

8:35 . Puzzling redox behavior of arsenic in sulfidic waters. G.R. Helz


10:00 . Surface reactivity of biogenic manganese oxides. O. Duckworth

10:25 Intermission.

10:40 . Changing the manganese paradigm: Soluble manganese(III) is ubiquitous in natural waters and sedimentary pore waters. G.W. Luther, V.E. Oldham, B.M. Tebo, M.R. Jones, A. Mucci, B. Sundby


11:25 . Manganese and iron oxides in mixtures with other metal oxides: Interaction mechanisms and redox reactivity. H.J. Zhang, S. Taujale, J. Huang, K. Rasamani

11:45 . Transformation of benzimidazole anthelmintic agents from reactions with manganese oxide. S. Liou, S. Wu, W. Chen
Nanotechnology for Sustainable Agriculture & Food Systems

Cosponsored by AGRO and CEI
P. Demokritou, J. C. White, Organizers
G. Lowry, N. B. Saleh, Organizers, Presiding

8:15 Introductory Remarks.


8:50 . Engineered Water Nanostructures (EWNS): A chemical free, nanotechnology based antimicrobial platform for inactivation of foodborne microorganisms across the farm-to-fork continuum. P. Demokritou, G. Pyrgiotakis


9:40 . Nanoscale micronutrients suppress plant disease and increase crop yield. J.C. White, W. Elmer

10:05 Intermission.

10:20 . Applications of cerium oxide nanoparticles for plant salt stress enhancement in agriculture. X. Ma, L. Rossi

10:45 . Impact of metal and metal oxide nanoparticle speciation and solubility on their bioavailability to terrestrial and aquatic plants. G. Lowry, J. Stegemeier, X. Gao, E. Spielman-Sun, S. Rodrigues

11:10 . Advanced nanomaterials for catalytic dephosphorylation and phosphorus recovery. M. Manto, C. Wang

11:35 . Starch stabilized silver nanoparticles, synthesis and their adsorption-desorption pattern for dichlorvos insecticide. N.E. Ihegwuagu, R. Sha’Ato, T. Tor-Anyiin, L. Nnamonu, B. Sone, O. Omojola, M. Maaza

Formation & Transformation of Atmospheric Aerosols: Air Pollution to Climate Change: Symposium in honor of Professor Renyi Zhang

Atmospheric Nucleation & SOA Formation

V. K. Sharma, Y. Wang, Organizers
M. Hu, A. Khalizov, Organizers, Presiding

8:15 Introductory Remarks.

8:45 . Inferring the stoichiometry and energetics of critical cluster formation from laboratory nucleation measurements. R. McGraw

9:05 . Impact of temperature dependence on the contribution of organics to new particle formation in the atmosphere. F. Yu


10:10 Intermission.

10:25 . Role of sub-2 nm particles in new particle formation. S. Lee


Section D

Innovative Materials & Technologies for Environmental Sustainability

Approaches for Sustainable Metal Recovery & Removal

Cosponsored by CEI
J. C. Crittenden, Q. Li, W. Zhang, Organizers, Presiding

8:30 Introductory Remarks.

8:35 . Characterization of coal mining by-products for recovery of rare earth elements. A.P. Walsh, E.J. Granite, T. Bank, B. Howard


9:15 . Stoichiometric hardness removal without use of brine or mineral acid as regenerant: A novel approach to sustainable softening. J. Li, A. SenGupta

9:35 . Interaction of Ferritin with phosphate and arsenate in relation to formation of ultra-small nanoparticles at loading with Fe. T. Hiemstra, W. Zhao

9:55 Intermission.

10:15 . Synergistic oxidation and removal of arsenite from groundwater using an energy-efficient advanced electrocoagulation. Y. Si, G. Li, C. Feng, F. Zhang


11:55 Concluding Remarks.

**Section E**

**Poly- & Perfluoroalkyl Substances: Environmental Behavior & Pollution Control**

D. Chiang, E. R. McKenzie, D. Woodward, *Organizers*
Q. Huang, L. S. Lee, *Organizers, Presiding*

8:00 Introductory Remarks.

8:10 . Water quality and co-contaminant effects on PFAA sorption and transport through saturated porous media. **E.R. McKenzie, R.L. Siegrist, J.E. McCray, C.P. Higgins**

8:35 . How does hydro-oleophobicity of perfluorocarbon chain affect interfacial behavior and mechanism of perfluorooctane sulfonate in oil-water mixture?. **P. Meng, S. Deng**

9:00 . PFOA transport into deep marine water—is the abyss a permanent sink?. **L.J. Thibodeaux**

9:25 . Development of a conceptual site model for PFAS fate and transport incorporating PFAA precursors. J. Burdick, E. Houtz, **I. Ross**

9:50 Intermission.

10:10 . PFAS best practices for sampling and analysis and future considerations. **M. Aucoin**


11:00 . Targeted improvements of analytical method for poly- and perfluoroalkyl substances in water, soil and sediment at PFAS-contaminated sites. **D. Chiang**

11:25 . Field deployable PFASs sensors for on-site assessments. **L. Chen, J. Thompson, M. Rossi**
Impacts of Energy Systems on Water Treatment

P. Mouser, D. L. Plata, Organizers
K. D. Good, J. M. Vanbriesen, Organizers, Presiding

8:30 Introductory Remarks.

8:45 Bromide, chloride, and associated brine constituents in waters from coal-bearing rocks in Pennsylvania. C.A. Cravotta

9:10 Modeling bromide concentration contributions from coal-fired power plants in southwestern Pennsylvania. K.D. Good, J.M. Vanbriesen

9:35 Effect of bromide discharges on source water bromide levels and disinfection by-product formation in North Carolina. D. Knappe, A. Greune, V. Edeback

10:00 Five-year review of water quality monitoring of Beaver Run Reservoir in Westmoreland County, PA. N.R. Mc Elroy, B. Okey, J. Richburg

10:25 Intermission.

10:40 Assessing the risk associated with increasing bromide in drinking water sources in the Monongahela River, Pennsylvania. Y. Wang, J.M. Vanbriesen

11:05 Electrochemical selective bromide removal from energy wastewater. M. Sun, G. Lowry, K.B. Gregory


11:55 Concluding Remarks.

Section G

Advances in Understanding PPCP Fate in Wastewater Collection & Treatment Systems

L. A. Rodenburg, Organizer
N. Fahrenfeld, Organizer, Presiding

8:30 Enhanced urinary excretion of N-nitrosodimethylamine following ranitidine consumption. T. Zeng, W. Mitch

8:50 Identification and measurement of morphine in wastewater by SPE and LC-MS and determination of the morphine structure in solution by NMR and RDC. F. Mahmoudi, W. Carroll

9:10 Antimicrobial chemicals are prevalent and problematic in dust as well as in wastewater treatment. E.M. Hartmann, R. Hickey, T. Hsu, C. Betancourt Román, J. Chen, R. Schwager, J. Kline, G. Brown, R.U. Halden, C. Huttenhower, J. Green

9:35 Factors controlling antibiotics levels in biosolids. B. Blackburne, N. Fahrenfeld, L.A. Rodenburg

10:15 Intermission.


11:10 . Impact of wastewater treatment plants on microplastics in freshwater water. S. Estahbanati, N. Fahrenfeld


Section H

Advances in Innovative Designs & Process Cost Estimation Techniques for Advanced Water Purification Technologies

Y. G. Adewuyi, E. Sahle-Demessie, Organizers, Presiding

8:15 Introductory Remarks.


8:45 . Plasma-based water treatment: Targeted application and guidelines for process scale-up. S. Mededovic, C. Bellona, T.M. Holsen, G. Stratton, F. Dai


9:35 . Charge and size selective ion sieving through Ti3C2T x MXene membranes. C. Ren, K.B. Hatzell, M.H. Alhabeib, Z. Ling, K.A. Mahmoud, Y. Gogotsi

10:00 Intermission.

10:15 . MOFs-embedded thin film composite membranes for reverse osmosis applications. M. Kadhom, W. Hu, B. Deng

10:40 . Organic fouling in membrane capacitive deionization systems. L. Southworth, R.D. Cusick

11:05 . Biodesalination of brackish water and sea water using halophytic algae. E. Sahle-Demessie, A. Aly Hassan, T. Richardson

Geochemistry of the Subsurface: CO2 Sequestration, Unconventional Oil & Gas Extraction, Geothermal Reservoirs & Radioactive Waste Disposal / Clay, MD Simulation & Electronic Structure. Sponsored by GEOC, Cosponsored by ENVR

Good Laboratory Practices for the Agrochemical Professional. Sponsored by AGRO, Cosponsored by ANYL and ENVR

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Degradation of Materials for Energy & Fuel Production. Sponsored by ENFL, Cosponsored by ENVR and MPPG

Innovative Chemistry & Materials for Electroenergy Production & Storage / Solid-State Batteries. Sponsored by ENFL, Cosponsored by ENVR and MPPG

Solar Fuels: Power to the People. Sponsored by ENFL, Cosponsored by ENVR and MPPG

Biomass. Sponsored by ENFL, Cosponsored by CATL, ENVR and MPPG

SUNDAY AFTERNOON

Aquatic Chemistry: Symposium in honor of Professor Alan T. Stone

Interfaces of Organic, Inorganic & Surface Chemistry in Natural & Engineered Systems

B. Deng, C. Huang, T. J. Strathmann, Organizers
D. Vasudevan, Organizer, Presiding

1:30 Introductory Remarks.

1:35. Effects of Mn(II) on the oxidative dissolution of U(IV)- and Cr(III)-containing solid. D. Giammar, Z. Wang, C. Pan
2:00. Oxalate in soils, plants and water: Role in controlling trace metal solubility. M.B. Mc Bride

2:25. Iron oxides in reactive systems. R. Penn


3:10 Intermission.

3:30. Role of coordination chemistry in mercury transformation. L. Liang


4:20. Reductive dissolution of iron (oxyhydr)oxide by 2,6-dimethoxy-1,4-hydroquinone and the generation of hydroxyl radicals. L. Krumina, G. Lyngsie, A. Tunlid, P. Persson

4:40. Interactions and oxidative reactivity in binary mixtures of goethite and γ-Al₂O₃ or soluble Al ions. K. Rasamani, S. Taujale, L. Baratta, H.J. Zhang

Section B

Next Generation Techniques for Prevention & Precise Growth of Biofilms at the Interface of Nanomaterials & Electrochemistry

S. Aggarwal, A. Badireddy, V. Gadhamshetty, Organizers, Presiding

1:30 Introductory Remarks.

1:35. Biofilm formation and control in water distribution systems. Y. Seo

1:55. Effects of surface topography and low-frequency electric fields on bioadhesion. R. Badireddy

2:15. Impact of nitrifying biofilms on disinfection byproduct formation within distribution system storage facilities. T. Zeng, W. Mitch

2:35. Investigating approaches to mitigate biofilms in drinking water distribution systems. S. Aggarwal


3:15 Intermission.


3:50. Influence of multi-species biofilm formation on corrosion of cast iron. F. Batmanghelich, L. Li, Y. Seo

4:10. Polymeric membranes modified with bioinspired polydopamine and silver nanoparticles for water purification applications. M. Fleming, K. Chen
4:30 . Correlation between electrochemical impedance and biofilm growth rate in the microbial capacitive deionization cell used for flowback water treatment. **N. Shrestha, G. Chilkoor, V. Gadhamshetty**

4:50 . Biofilms in a simulated drinking water systems- impact of disinfection and pipe material on biofilm abundance and microbial community. **S. Aggarwal, Y. Jeon, C.K. Gomez-Smith, T. LaPara, R.M. Hozalski**

5:10 Concluding Remarks.

**Section C**

Formation & Transformation of Atmospheric Aerosols: Air Pollution to Climate Change: Symposium in honor of Professor Renyi Zhang

Aerosol-Cloud-Climate Interactions

M. Hu, A. Khalizov, V. K. Sharma, Organizers
Y. Wang, Organizer, Presiding
J. Fan, Presiding

1:30 . How and how much air pollution has contributed to climate changes in China?. **Z. Li**

1:55 . Climate response to anthropogenic aerosol forcing. **C. Wang**

2:20 . Dominant snow-forming processes in warm and cold mixed-phase orographic clouds: Effects of cloud condensation nuclei and ice nuclei. **J. Fan, L. Leung, D. Rosenfeld, P.J. DeMott**

2:45 . Secondary inorganic aerosols in China: Contributions from emissions, chemistry, and meteorology. **Y. Wang**


3:30 Intermission.

3:45 . How fast do we pollute pristine marine air that flows onshore?. **D. Rosenfeld**

4:10 . Aerosol-cloud-interaction conundrum and buffering mechanisms. **Y. Liu**


5:00 . Aerosol-cloud-climate interactions from a modeling perspective. **Y. Wang**
Innovative Materials & Technologies for Environmental Sustainability

Approaches for Sustainable Metal Recovery & Removal

Cosponsored by CEI
J. C. Crittenden, Q. Li, W. Zhang, Organizers, Presiding
A. Badireddy, Presiding

1:30 Introductory Remarks.

1:35. Synergistic effect of metal combinations in ferrite nanoparticles for arsenate and arsenite removal. X. Wei, N. Cady, A. Mosier

1:55. Adsorption of lead ions from aqueous phase on mesoporous silica with P-containing pendant groups. C. Gunathilake, M.S. Kadanapitiye, S. Huang, M. Jaroniec

2:15. Development of biosorption process using sewage sludge for treating acid mine drainage. N. Kim, J. Seo, D. Park

2:35. Synthesis, characterization, and heavy metal metal binding properties of new sugar-based glycolipid surfactants. S.M. Fathi, R.M. Maier, J.E. Pemberton


3:15 Intermission.


3:55. Recovery of lithium and cobalt from spent rechargeable batteries by fungal bioleaching. A. Lobos, J.A. Cunningham, V.J. Harwood

4:15. Efficient uranium extraction from oceans: an economical approach towards up-keeping nuclear reactors in the future. A.C. Dassanayake, C. Gunathilake, S. Brown, S. Dai, M. Jaroniec

4:35. XAFS investigation of how amidoxime functionalized adsorbents bind uranium for extraction from seawater. C.W. Abney

4:55 Concluding Remarks.
Poly- & Perfluoroalkyl Substances: Environmental Behavior & Pollution Control

Q. Huang, E. R. McKenzie, D. Woodward, Organizers
D. Chiang, L. S. Lee, Organizers, Presiding

1:30 Introductory Remarks.

1:35 Environmental pollution and water quality criteria perfluorinated chemicals in China. Z. Liu, X. Wang

2:00 PFAS in surface water and fish tissue from the Delaware River. R. MacGillivary

2:25 Branched ultra short chain Fluorosurfactants- A new class of surface active material combining outstanding eco toxicological behavior with superior technical performance. R. Friedrich

2:50 RNA-seq analysis reveals the hepatotoxicity mechanism of perfluoroalkyl alternatives HFPO2 and HFPO4 exposure in mice. J. Dai

3:15 Intermission.

3:30 Mechanistic insights into the adsorption of perfluoroalkyl substances on activated carbon. D.J. Van Hoomissen, S. Vyas


4:45 Electrochemical degradation of PFOA and PFOS by porous Ti4O7 anode in batch and filtration modes. H. Lin, J. Niu, S. Liang, Q. Luo, Q. Huang

5:10 Experimental and theoretical insights into the photochemical decomposition of environmentally persistent perfluorocarboxylic acids. R. Qu, J. Liu, C. Li, L. Wang, Z. Wang

Impacts of Energy Systems on Water Treatment

K. D. Good, J. M. Vanbriesen, Organizers
P. Mouser, D. L. Plata, Organizers, Presiding

1:30 What goes in must come out: Organic compounds in oil sands, their extraction products, and environmental implications. B. Drollette, D. Gentner, D.L. Plata

2:00 Non-target screening for polar to semi-polar organic compounds in hydraulic fracturing fluids. M. Nell, D. Helbling

3:00. Hydraulic fracturing fluid reactivity: organic transformations in the shale rock parameter space. 
A.J. Sumner, D.L. Plata

3:25 Intermission.

N.R. Warner, W.D. Burgos, P. Drohan, T.J. Geeza, L.E. Castillo Meza

4:05. Reactive propping agent to immobilize heavy metals and radionulides in the subsurface during hydraulic fracturing. V. Prigiobbe, Z. Ye

4:30. Removal of boron from hydraulic fracturing flowback water by aluminum and iron electrocoagulation prior to discharge. S. Chellam

4:55. Arsenic species in anoxic incubations of Marcellus shale. A. Keimowitz

5:20 Concluding Remarks.

Section G

Advances in Understanding PPCP Fate in Wastewater Collection & Treatment Systems

N. Fahrenfeld, L. A. Rodenburg, Organizers, Presiding


1:50. Role of nitrifying bacteria in fate of triclosan. E. Lauchnor, K. Bodle


2:30 Intermission.

2:45. Reaction kinetics and transformation products for ozonation of the oxybenzone, octinoxate, and octocrylene UV-filters. L.M. Blaney, Z. Hopkins


3:30. Ozonation of antibiotics in water with a high bromide (Br⁻) content. O. Heegun, Y. Jung, M. Kwon, J. Kang

3:50. Degradation of atrazine by UV/chlorine: Efficiency, influencing factors, and products. X. Kong, J. Jiang, J. Ma

4:10 Intermission.

4:45. Phototransformation of meperidine and methadone in aqueous environment. **Y. Lin**, M. Hsieh, A.Y. Lin


**Section H**

**Advancing Teaching & Learning in Environmental Chemistry Courses: Innovative Tools & Techniques**

Financially supported by AEESP
N. Dai, A. Shah, J. Sivey, *Organizers, Presiding*

1:30 Introductory Remarks.

1:35. Environmental success stories: Teaching a positive-message non-science’s majors course in environmental chemistry. **F.M. Dunnivant**

1:55. Inquiry-based learning in environmental chemistry throughout a liberal arts college chemistry curriculum. **A. Graham**


2:35 Intermission.

2:50. Integration of environmental principles in chemical engineering design. **L. Soh**

3:10. Enhancing learning of analytical chemistry techniques for environmental applications at the graduate level: Course design, optimization, and challenges. **A. Shah**

3:30. Exploration in environmental chemistry laboratory. **J. Zhang**

3:50 Intermission.

4:05. Liquid chromatography simulator software as a discovery-based learning tool for environmental and instrumental analysis courses. **J. Sivey**

4:25. Incorporating modeling software and overarching problems to promote students learning in aquatic chemistry. **W. Xu**

4:45. Free educational software, videos, and etextbooks for environmental chemistry. **F.M. Dunnivant**

5:05 Concluding Remarks.

**Advances in Residues Analysis of Bee Relevant Matrices: Analytical Methods & Sampling Techniques.** Sponsored by AGRO, Cosponsored by AGFD and ENVR
MONDAY MORNING

Aquatic Chemistry: Symposium in honor of Professor Alan T. Stone

Interfaces of Organic, Inorganic & Surface Chemistry in Natural & Engineered Systems

B. Deng, C. Huang, D. Vasudevan, Organizers
T. J. Strathmann, Organizer, Presiding

8:00 Introductory Remarks.

8:20 . Aquatic chemistry in practice. J. Hering

8:45 . Direct ring cleavage of aromatic compounds during oxidative water treatment. C. Prasse, J. Van Buren, D.L. Sedlak

9:35. From electrochemical reduction of oxyanions to photoelectrochemical degradation of hazardous organic compounds in dilute aqueous solutions and beyond. C. Huang, H. Liu, S. Park

10:00 Intermission.


10:40. Permanganate oxidations: Organic intermediates, products and ambient chemistry effects. X. Xia, A.T. Stone

11:00. Application of ferrate oxidation for eliminating pharmaceuticals in source-separated human urine. C. Luo, V.K. Sharma, C. Huang

11:20. Kinetics and mechanisms of Cr(VI) formation via the oxidation of Cr(III) solid phases by chlorine in drinking water. H. Liu

11:40. Chemical structure impacts on surface enhanced Raman spectroscopic detection of environmental pollutants. P.J. Vikesland, H. Wei

Chemistry of Environmental Sorptive & Oxidative Processes: Symposium in honor of Joseph J. Pignatello

A. MacKay, M. Sander, D. Zhao, Organizers
F. Xiao, B. Xing, Organizers, Presiding

8:00 Introductory Remarks.

8:15. Transport and sorption of persistent organic pollutants on suspended particles in rivers. P. Grathwohl

8:45. Adsorption and reactions of organic compounds on pyrogenic carbonaceous surfaces: So, what else is new?. J.J. Pignatello


9:45 Intermission.

10:00. Entropy driven sorption and intraparticle diffusion for hydrophobic organic compounds: An underlying process commonality. A. Sengupta

10:30. Comparison of lead removal by different adsorbents. X. Meng, Q. Shi, A. Terracciano, Y. Zhao, C. Wei, J. Ge, H. Su

11:00. Interactions of atrazine and lamotrigine with carbon nanotubes: Effects of co-introduction of DOM and solution conditions. B. Chefetz, M. Engel

**Section C**

**Formation & Transformation of Atmospheric Aerosols: Air Pollution to Climate Change:**

**Symposium in honor of Professor Renyi Zhang**

**Composition & Properties of Atmospheric Particles**

M. Hu, V. K. Sharma, Y. Wang, *Organizers*
A. Khalizov, *Organizer, Presiding*
S. Brooks, *Presiding*

8:00 . Mass Spectrometry of Atmospheric Aerosol: 1 nanometer to 1 micron. **D.R. Worsnop**


9:50 Intermission.

10:05 . Broadening our conceptual model of organic compounds in atmospheric aerosol: Viscous liquids catalyze ice nucleation. **S. Brooks**

10:30 . Nanospectroscopic and nanomechanical studies on individual aerosols of urban pollution. L. Wang, Y. Li, **X. Xu**


11:30 . Charge transfer complexes in ambient light-absorbing particulate matter (brown carbon). S. Phillips, **G.D. Smith**
Innovative Materials & Technologies for Environmental Sustainability

Approaches for Water Disinfection & Removal of Emerging Contaminants

Cosponsored by CEI
J. C. Crittenden, Q. Li, W. Zhang, Organizers, Presiding
M. Li, Presiding

8:30 Introductory Remarks.

8:35. Engineering electrochemical oxidation processes for the removal of emerging contaminants. X. Meng, R. Xie, Y. Chen, J.C. Crittenden

8:55. Electro-oxidation of tetracycline by a Magnéli phase Ti$_4$O$_7$ anode. S. Liang, H. Lin, Q. Huang


9:35. Reevaluation of ferrate(VI) decomposition in water with natural organic matters (NOMs). Y. Deng, C. Jung

10:00 Intermission.

10:15. Composite of hydrophilic polyurethane foams enriched with PAC to enhance adsorption capacity and control rate of contaminants from aqueous solutions. N. Massalha, A. Brenner, C. Sheindorf, Y. Haimov, I. Sabbah

10:35. Flexible, switchable aerogel composites as reusable sorbents for oil capture and recovery. O. Karatum, D.L. Plata


11:15. Renewable enzyme biocatalysis for water reuse: cell surface display fungal laccases for degradation of persistent micropollutants. Y. Chen, M. Kumar, N. Wei

11:35. High-level quantum calculations of sulfate radical generation for remediation of contaminated groundwater. B.M. Wong, H. Liu, E. Garcia

11:55 Concluding Remarks.

Section E

Poly- & Perfluoroalkyl Substances: Environmental Behavior & Pollution Control

D. Chiang, Q. Huang, L. S. Lee, Organizers
E. R. McKenzie, D. Woodward, Organizers, Presiding

8:00 Introductory Remarks.


8:55 . Degradation of perfluoroalkyl acids by enzyme catalyzed oxidative humification reactions. Q. Luo, Q. Huang

9:20 . Fate of the perfluoroalkyl substances and their precursors in pilot- and full-scale direct potable reuse facilities. C. Glover, E. Dickenson

9:45 Intermission.

10:00 . Complete defluorination of perfluorinated compounds by hydrated electrons generated from 3-indole-acetic-acid in organomodified montmorillonite. C. Gu

10:25 . Decomposition of perfluoroctanoic acid by hydrated electrons in the presence of different organomontmorillonite and indole derivatives. H. Tian, C. Gu


11:15 . Decomposition of perfluorinated carboxylic acids with four different acids: Reaction kinetics, pathways and mechanisms. J. Liu, R. Qu, Z. Wang

Section F

Advances & Challenges in Food-Energy-Water Nexus

Cosponsored by AGRO and CEI
S. Ahuja, S. Chae, D. D. Dionysiou, Y. Lin, Organizers
I. Chowdhury, Organizer, Presiding

8:00 Introductory Remarks.

8:05 . Managing challenges of the food-energy-water nexus. S. Ahuja


8:55 . Integrated energy-water planning in the eastern interconnection. K. Quinter, V.C. Tidwell, E. Carraway, D. Ladner

9:20 . Food, energy water nexus, complicated by global climate and the need for new technology. J.W. Finley

9:45 Intermission.

10:00 . Multi-objective optimization model for minimizing cost and environmental impact in shale gas water and wastewater management. T.V. Bartholomew, M.S. Mauter

10:50. Unexpected ion-exchange reactivity of nanometric scheelite: Applications in food, energy, and water sectors. **A.W. Apblett**, C.K. Perkins

11:15. Impact of cerium oxide nanoparticles on plant water use efficiency at different environmental conditions. **X. Ma**

11:40 Concluding Remarks.

Section G

**Understanding Nanomaterial Behavior: Breakthroughs & Challenges**

A. Orlov, Organizer  
N. Savage, Organizer, Presiding

9:00. Nanotechnology environmental, health, and safety challenges: A National Nanotechnology Coordination Office perspective. **L. Friedersdorf**

9:20. Nanotechnology environmental, health, and safety challenges, research, and opportunities panel. **N. Savage**

9:40. Nanotechnology health implications research consortium. **S. Nadadur**

10:00. Nanotechnology environmental, health, and safety challenges, research, and opportunities federal panel: NIST perspective. **D. Kaiser**

10:20. Nanotechnology environmental federal panel: NIOSH perspective. **C.L. Geraci**

10:40 Intermission.

10:50 Panel Discussion.

11:50 Concluding Remarks.

Section H

**Synthetic Biology & Genetically Modified Organisms**

**Evolution or Revolution? Policy Challenges & Opportunities in the Biotechnology Golden Age**

Cosponsored by AGFD, AGRO, CEI and COMSCI

C. W. Avery, Organizer  
S. H. DeLuca, Organizer, Presiding

8:00 Introductory Remarks.
8:05. Caterpillar cross tolerance/resistance to *Bacillus thuringiensis*: Don’t forget our history. **R.M. Roe**, A. Dhammi, J. Zhu, D. Reisig, R.W. Kurtz

8:25. Pros and cons of the first 20 years of GMO cotton production. **K. Edmisten**

8:45. Local vs. global population editing: A novel and responsible approach to gene drive. C. Noble, A. Chavez, J. Schulak, J. Olejarz, A. Smidler, G. Church, M. Nowak, **K. Esvelt**

9:05. Starting a dialog about GMOs with non-majors through three editions of Chemistry in Context. **J.P. Ellis**


9:45 Intermission.

10:15. Engineering biology for the U.S. bioeconomy. **M. Maxon**

10:35. First things first: What is a GMO?. **A. Massey**

10:55. Legal and regulatory implications of genetic engineering for the chemical community. **L.L. Bergeson**

11:15. Genetically engineered governance: Why international governance systems need their DNA engineered to keep pace with genomic technologies. **T. Kuiken**

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**Geochemistry of the Subsurface: CO2 Sequestration, Unconventional Oil & Gas Extraction, Geothermal Reservoirs & Radioactive Waste Disposal / Water Film & General Shale.** Sponsored by GEOC, Cosponsored by ENVR

**USA-China Symposium on Energy.** Sponsored by ENFL, Cosponsored by ENVR

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**Increasing the Value of Water Monitoring Data for Pesticide Fate & Effects Evaluations.** Sponsored by AGRO, Cosponsored by ENVR and TOXI

**Novel Analytical Methods for Analysis of Emerging Contaminants of Concern: Advances & Challenges.** Sponsored by AGRO, Cosponsored by ANYL and ENVR

**Neonicotinoid Insecticides: Use, Fate & Effects.** Sponsored by AGRO, Cosponsored by ENVR

**Solar Fuels: Power to the People.** Sponsored by ENFL, Cosponsored by ENVR and MPPG

**Glyphosate: Current Status & Future Prospects.** Sponsored by AGRO, Cosponsored by AGFD and ENVR
Novel Materials for Gas Separation, Storage & Utilization / Storage. Sponsored by ENFL, Cosponsored by ENVR and MPPG

Biomass. Sponsored by ENFL, Cosponsored by CATL, ENVR and MPPG

MONDAY AFTERNOON

Aquatic Chemistry: Symposium in honor of Professor Alan T. Stone

Interfaces of Organic, Inorganic & Surface Chemistry in Natural & Engineered Systems

C. Huang, T. J. Strathmann, D. Vasudevan, Organizers
B. Deng, Organizer, Presiding

1:30 Introductory Remarks.

1:35 Predicting environmental partitioning via quantum chemistry, Abraham parameters and pp-LFERs. D.M. Ditoro, Y. Liang, T. Torralba-Sanchez

2:00 Cheminformatics applications and physicochemical property calculators: A powerful combination for the encoding of process science. E.J. Weber, C.T. Stevens


3:15 Intermission.

3:30 Environmental fate data as inputs to modeling pesticide concentrations in ground and surface water. A.C. Barefoot

3:55 Metabolization and degradation kinetics of the urban-use pesticide fipronil by white rot fungi Trametes versicolo. J. Wolfand, G.H. LeFevre, R.G. Luthy


4:40 Revisiting molecular weight and polydispersity measurements by high-pressure size exclusion chromatography: Accounting for changes in analytical standards and isolation techniques. B. McAdams, G. Aiken, W. Arnold, Y. Chin
Chemistry of Environmental Sorptive & Oxidative Processes: Symposium in honor of Joseph J. Pignatello

A. MacKay, M. Sander, D. Zhao, Organizers
F. Xiao, B. Xing, Organizers, Presiding

1:30 . Evolution of environmental sorption processes into mainstream soil/sediment remediation. U. Ghosh

2:00 . Insights into nanoparticle interaction with cell surfaces from model systems. J.A. Pedersen

2:30 . Sorption mechanisms of organic contaminants by carbonaceous nanomaterials. X. Wang, X. Shen

3:00 Intermission.

3:15 . Pore effect on sorption of hydrophobic organic chemicals (HOCs) to synthetic porous materials. D. Zhu

3:45 . Green synthesis of graphene oxide hydrogels with superior mechanical properties and contaminant adsorption capacity. N. Yousefi, K. Wong, A. Angulo, N. Tufenkji

4:15 . Sorption of heavy metals on pyrogenic carbonaceous materials: Roles of carboxyl ligands. S.M. Uchimiya

4:45 . Removal of organic and inorganic contaminants by carbon-based sorbents. B. Gao

5:15 Concluding Remarks.

Formation & Transformation of Atmospheric Aerosols: Air Pollution to Climate Change: Symposium in honor of Professor Renyi Zhang

Gas-Phase & Gas-Particle Reactions

M. Hu, A. Khalizov, V. K. Sharma, Y. Wang, Organizers
C. Qiu, L. Wang, Presiding

1:30 . Determination of atmospheric amines and amides in urban Shanghai, China. L. Yao, M. Wang, L. Wang

1:50 . Heterogeneous reaction mechanism of gaseous HNO₃ with solid NaCl: a density functional theory study. F. Xu, N. Zhao, Q. Zhang, W. Wang

2:10 . Thermochemistry and kinetic modeling for OH addition to trifluoroethene. J.W. Bozzelli, S. Yomme

2:50 Intermission.

3:05. Particles in the marine atmosphere. P. Liss

3:30. Thermostability and hygroscopicity of monoethanolammonium carboxylates for evaluating environmental impacts of carbon dioxide sequestration by reversible chemical absorption. X. Zhang, J. Dawson, C. Qiu, A. Khalizov


4:10. Heterogeneous ozonolysis of trimethylamine on the typical model atmospheric particle. Y. Liu, Y. Ge, B. Chu, H. He

4:30. Formation, transformation, and impacts of atmospheric aerosols under polluted environments. R. Zhang

Section D

Innovative Materials & Technologies for Environmental Sustainability

Approaches for Water Disinfection & Removal of Emerging Contaminants

Cosponsored by CEI
J. C. Crittenden, Q. Li, W. Zhang, Organizers, Presiding

1:30 Introductory Remarks.

1:35. Multi-functional gel materials for malodor control. L. LUK, W. Han, K. YEUNG

1:55. Identification and quantification of free radicals generated by zerovalent bimetallic Fe/Al in water. H.L. Lien, C. Yu


2:35. Surface plasmonic photothermal water disinfection. S. Loeb, C. Li, J. Kim

2:55. Two approaches to achieve visible light upconversion for environmental application. J. Kim

3:20 Intermission.


4:15. Anion recovery from water by cross-linked cationic surfactant nanoparticles across ultrafiltration membranes. M. Chen, C.T. Jafvert

4:55. Comparison of energy efficiency and power density in pressure retarded osmosis and reverse electrodialysis. **N. Yip**, M. Elimelech

5:15 Concluding Remarks.

### Section E

**Poly- & Perfluoroalkyl Substances: Environmental Behavior & Pollution Control**

D. Chiang, Q. Huang, L. S. Lee, D. Woodward, *Organizers*
E. R. McKenzie, *Organizer, Presiding*

1:30 Introductory Remarks.

1:35. Destruction of PFOS in groundwater: a new *in situ* remediation technology for per / polyfluorinated alkyl substances. J. Hurst, T. Pancras, J. Burdick, E. Houtz, J. Mcdonough, **A. Mushtaque**, A. Horneman, **I. Ross**

2:00. Remediation of perfluoralkyl substances (PFAS) with OxyZone®, a multi-oxidant blend. **A. Moore**

2:25. *Ex situ* treatments of Aqueous Film-Forming Foam impacted water. **G.M. Birk**, D.F. Alden, R. Stuart


3:15 Intermission.

3:30. Evaluation of *ex situ* PFAS treatment technologies. **D. Chiang**


4:20. PFAS panel: What, when, and why to analyze and remediate PFASs. **D. Woodward**

5:20 Concluding Remarks.

### Section F

**Advances & Challenges in Food-Energy-Water Nexus**

Cosponsored by AGRO and CEI
S. Ahuja, I. Chowdhury, D. D. Dionysiou, Y. Lin, *Organizers*
S. Chae, *Organizer, Presiding*

1:30 Introductory Remarks.

2:00 . Advances and challenges in recycling of high strength organic waste and wastewater for clean water and energy. S. Chae


2:50 . Identifying data gaps in understanding feasibility of reuse of nanoparticles-containing wastewater in aquaculture. A. Kumar, P. Gurian, A. Anandan, D. Singh, B. Sundaram

3:15 Intermission.


3:55 . Trace element allocation across air pollution control devices in coal fired power plants. X. Sun, D. Gingerich, I. Azevedo, M.S. Mauter


4:45 Concluding Remarks.

Section G

Developing International Policies for Nanoparticles in the Environment

R. Luque, S. O. Obare, Organizers, Presiding

1:30 Introductory Remarks.

1:35 . Chemical speciation of anthropogenic nanoparticles. S.O. Obare

2:00 . Nanomagnetism in the environment: A review. P.A. Augusto, T. Castelo-Grande, A.M. Estevez, D. Barbosa


3:15 Intermission.

3:25 . Adsorption of cerium oxide nanoparticles on silica and kaolinite. X. Ma

4:15 . Benign by design nanomaterials from biomass and waste: Synthesis and applications. **R. Luque**


5:05 Concluding Remarks.

Section H

**Synthetic Biology & Genetically Modified Organisms**

**The Debate: What Role Should We Play in the Biotechnology Era?**

Cosponsored by AGFD, AGRO, CEI and COMSCI
S. H. DeLuca, Organizer
C. W. Avery, Organizer, Presiding


2:20 Concluding Remarks.

2:25 Intermission.

2:35 Opening Statements.

2:40 Panel Discussion: What roles should we play in the biotechnology era? S. Parthasarathy.

3:55 Concluding Remarks.

**Geochemistry of the Subsurface: CO2 Sequestration, Unconventional Oil & Gas Extraction, Geothermal Reservoirs & Radioactive Waste Disposal / Contamination & Waste.** Sponsored by GEOC, Cosponsored by ENVR

**USA-China Symposium on Energy.** Sponsored by ENFL, Cosponsored by ENVR

**Increasing the Value of Water Monitoring Data for Pesticide Fate & Effects Evaluations.** Sponsored by AGRO, Cosponsored by ENVR and TOXI

**Novel Nanomaterials / CO2 Conversion & Other Applications.** Sponsored by ENFL, Cosponsored by CATL and ENVR

**Novel Analytical Methods for Analysis of Emerging Contaminants of Concern: Advances & Challenges.** Sponsored by AGRO, Cosponsored by ANYL and ENVR
Innovative Chemistry & Materials for Electroenergy Production & Storage / Supercapacitors. Sponsored by ENFL, Cosponsored by ENVR and MPPG

Neonicotinoid Insecticides: Use, Fate & Effects. Sponsored by AGRO, Cosponsored by ENVR

2D Materials: Graphene & Beyond & their Device Applications. Sponsored by ENFL, Cosponsored by ENVR

Glyphosate: Current Status & Future Prospects. Sponsored by AGRO, Cosponsored by AGFD and ENVR

Undergraduate Research Posters / Environmental Chemistry. Sponsored by CHED, Cosponsored by ENVR and SOCED

Environmental Fate & Modeling of Agriculturally-Related Chemicals. Sponsored by AGRO, Cosponsored by ENVR

Novel Materials for Gas Separation, Storage & Utilization / Utilization. Sponsored by ENFL, Cosponsored by ENVR and MPPG

Pollinators: Agrichemicals, Behavior & Disease. Sponsored by AGRO, Cosponsored by AGFD, ENVR and TOXI

Biomass. Sponsored by ENFL, Cosponsored by CATL, ENVR and MPPG

Advances in Chemistry of Energy & Fuels. Sponsored by ENFL, Cosponsored by ENVR and MPPG

MONDAY EVENING

Section I

Sci-Mix

D. D. Dionysiou, Organizer

8:00 - 10:00

. Water quality and public health: Role of wastewater. T. Tongesayi, S. Tongesayi


. Interaction forces between microalgae cells and membrane surface based on XDLVO theory in algae harvesting using axial vibration membrane. F. Zhao, Y. Zhang, H. Chu, X. Zhou

. 1,4-Dioxane removal in flow-through water treatment system using combined ozone and ultrasound. M. Dietrich, R.C. Smith, G. Andalari, R.P. Suri
Modification of polysulfone (PSF) hollow fiber membrane (HFM) with zwitterionic or charged polymers for water purification. P. Wan, M. Bernards, B. Deng


Investigating the photochemical fate of triclosan as a function of water quality parameters. M. Petrie, G. Waligroski, A.M. Grannas

Environmental influences and fate of triclosan in a Southeastern Pennsylvania watershed: Sources in the East Branch of the Brandywine Creek. G. Waligroski, K. Hanley, A.M. Grannas, S. Goldsmith

Efficacy of multilevel antimicrobial coating in reducing vancomycin-resistant Enterococci in hospital ward. B. Zhong, H. Leung, J. Kwan, K. Yeung

Adsorption of pharmaceuticals in columns packed with palygorskite-montmorillonite clay particles. N.D. Danielson, T. Berhane, M.P. Krekeler, J. Levy

Suspect screening for organic micropollutants in wastewater influent and effluent in New York state. A. Pochodylo, D. Helbling

Isotope-dilution extraction and analysis of priority contaminants in BNR slurry. O. Quinones, B. Vanderford, E. Dickenson

Effect of a physical classroom demonstration on understanding of chemical equilibrium. K. Barrett


Use of metal chloride additives as Lewis Acids in the liquid phase reaction of furfural and furfuryl alcohol. S. Ogozaly, K. Marotta, L.A. Welch

Novel Diatom-Fe composites as catalyst for photodegradation of Rh-6G in aqueous media. M. Thakkar

Catalytic oxidation of vinyl chloride and CO over ruthenium oxides supported on heterostructured CoPO-MCF materials. C. Tian

Microbial leaching of iron from hematite into seawater mediated via Anthraquinone-2,7-disulfonate as a model of humic substance. A. Aneksampant, M. Fukushima

Electrochemistry of phenols, anilines, and related shuttle compounds. A.S. Pavitt, P.G. Tratnyek

Mechanism of Cr(VI) reduction by oxalic acid in the presence of Mn(II). F. Wang, B. Deng, C. Lin
DRIFTS, ATR and transmission FTIR sampling techniques for quantitative measurements on lignocellulose. **M. Gogna**, R.E. Goacher

Water at the ionic liquid vapor interface using ambient pressure X-ray photoelectron spectroscopy. **A. Broderick**, J.T. Newberg, Y. Khalifa

Fate and transport of common organic pollutants through water saturated cores of Berea sandstone. **S.P. Labrecque**, W. Blanford

Sorption of organic and inorganic pollutants on thermally treated sediments with high organic matter content. M. Wu, **D. Zhou**, F. Chen, B. Pan

Extracellular iron reduction by the Gram-positive fermenter *Clostridium beijerincki*. **J.K. Choi**, N. Yee

Enhanced dechlorination of highly chlorinated solvents in groundwater through amendment with hydroxypropyl-beta-cyclodextrin. **M.P. Pecoraro**, W. Blanford

Effect of surface treatment on GAC as an electron acceptor in microbial transformation reactions. **A.M. Redwan**, K. Millerick

Enhanced capacitive deionization performance using electrodes with polysaccharide binders. **M. Kim**, R.D. Cusick

Fouling resistant nanocomposite cation exchange membrane with enhanced salinity gradient power generation for reverse electrodialysis. **X. Tong**, B. Zhang, Y. Chen

Heterogeneous structure of 1-D mixed phase TiO$_2$ nanorod arrays with enhanced photocatalytic activity. **L. Kao**, L. Ya Hsuan

Template free synthesis of ZnO doped WO$_3$ and undoped WO$_3$ catalyst for photocatalysis of perfluorooctanoic acid. **S. Singh**, S. Lo, M. Chen

Mineralization of synthetic imidacloprid-containing wastewater by photo-activated peroxydisulfate oxidation technology. **Y. Liao**, Y. Shih, Y. Huang

Green synthesis of multifunctional mesoporous composites from display panel glasses for selective adsorption of metal ions. **C. Tsai**, R. Doong, H. Hung

Response of marine boundary layer cloud properties to aerosol perturbations from the 19-month AMF-Azores campaign. **J. LIU**, Z. Li, M. CRIBB

Absorbing aerosol-induced changes in extratropical circulation in an atmospheric general circulation model. **Z. Shen**, Y. Ming

Role of wind shear at different vertical levels: Regulating aerosol impact. **Q. Chen**, J. Fan

Detection of discrete wildfire aerosol emission events as recorded in the Greenland ice sheet. **J. Kennedy**


. Physiologic and epigenetic alterations in offspring following prenatal exposure to particulate matter air pollution in two strains of mice. K. Rychlik, J.C. Pulczinski, M.L. Zamora, R. Zhang, N.M. Johnson

. Effects of atmospheric aerosols on climate and air quality in Eastern US using a source-oriented WRF/Chem model. H. Zhang, F. Han, H. Guo

. Occurrence of methylmercury in rice-base infant cereals and estimation of daily dietary intake of methylmercury for infants. W. Cui, G. Liu, Y. Cai


. Automated extraction and analysis of explosives in soil samples with supercritical fluids. W. Hedgepeth, K. Tanaka


. Determination of Arsenic (III) using gold nanoparticles-modified screen-printed carbon electrodes immobilized with acetylcholinesterase enzyme. D. Orefuwa, B. Workie, E. Sahle-Demessie, T. Li

. Potential concentrations of select trace metals from road salt corrosion. P. Pascucci

. Evaluation of multiple heavy metals and metalloids in glass beads used in retroreflective road markings. M.B. Rosen, L. Pokhrel, B. Dubey

. Use of $^{129}$I in monitoring nuclear releases to the sediments of Lake Ontario. U. Rao, M. Kruge, Y. Muramatsu, C. Blithe, M. Montemarano

. Leaching behavior of the boron and fluorine in fly ashes recovered from electrostatic precipitators of pulverized coal-fired plants. N. Tsubouchi, K. Shibuya, Y. Muto, Y. Ohtsuka

. Understanding fluorescence energy transfer for toxicant detection and environmental monitoring efforts. M. Verderame, D.J. DiScenza, N. Serio, M. Levine

. EPA online prediction physicochemical prediction platform to support environmental scientists. A.J. Williams, K. Mansouri, C. Grulke, J. Edwards, J. Smith, J. Foster, D. Lyons

. Tunable anion exchange to treat Marcellus flowback wastewater and recover barium using impaired acid mine drainage (AMD). J. Li, A. SenGupta

. Synthesis and application of a cross-linked cationic surfactant micelle for removing anions from water. M. Chen, C.T. Jafvert
. High throughput detection and identification of chemical excursions via GC-MS. **P. Kaur**, C.N. Stedwell, J.D. Debord

. Graphene-wrapped Bi$_2$O$_2$CO$_3$ core-shell structures with enhanced quantum efficiency profit from an ultrafast electron transfer process. **D. Li**, Y. Zhang


. Organic-nanomaterial-aggregate and dispersion of polyaromatic hydrocarbons in water. E. Sahle-Demessie, **C. Han**, A. Zhao, H. Greseke, Y. Oh, S. Chae


. Nanostructured phosphate sensors based on Co-Cu electrodes fabricated with a sacrificial glass fiber paper template. X. Wang, J. Church, **W.H. Lee**, H.J. Cho

. Quantitative structure-activity relationships of functionalized carbon nanotubes. **R. Lougee**, D. Fourches


. Nanoselenium sponge technology for mercury removal from water. **S. Ahmed**, J. Brockgreitens, A. Abbas

. Evaluation of cyclodextrin modified zeolites as sorbent for removal of common organic pollutants from water streams. **W. Blanford**, B. Sang, S. Mai

. Reduction of viable microorganisms and biofilm formation via modification of surfaces with a novel antimicrobial system. **V. Singh**, D. Jofat, G. O'Mullan, W. Blanford, R. Engel

. Photochemistry of dissolved black carbon released from biochar. **H. Fu**, X. Qu, D. Zhu

. Atrazine contamination in agricultural soils from the Yangtze River Delta of China and associated health risks. **J. Sun**, D. Tsang, L. Pan, L. Zhu, **X. Li**


. Helical nature of perflurochemicals and its implications. M.A. Pagenkopf, D.J. Van Hoomissen, **S. Vyas**

. Remediation of 1,2-dichloropropane in aqueous environments by reductive dehalogenation. **N. Lapeyrouse**, C.G. Lewis, T.E. Shaw, C.A. Clausen, C. Yestrebsky
. Novel method for the reductive dechlorination of 1,2-dichloropropane in aqueous environments. C.G. Lewis, N. Lapeyrouse, T.E. Shaw, C.A. Clausen, C. Yestrebsky

. Sono-electro-Fenton degradation of 4-chlorophenol in aqueous media. R. Nazari, L. Rajić, A. Alshawabkeh

. Environmental usage of poly(2-acrylamido-2-methyl-1-propanesulfonic acid sodium salt –co- 3-acrylamidopropyl-trimethyl ammonium chloride)- Lentinus tigrinus (Bull.) Fr. composite hydrogel. D. Alpaslan, T. Ersen, S. Kubilay, Y. Uzun, A. Savran, N. Aktas

**TUESDAY MORNING**

Section A

**Aquatic Chemistry: Symposium in honor of Professor Alan T. Stone**

**Interfaces of Organic, Inorganic & Surface Chemistry in Natural & Engineered Systems**

B. Deng, C. Huang, T. J. Strathmann, D. Vasudevan, *Organizers*

R. F. Carbonaro, *Presiding*

8:00 Introductory Remarks.

8:05 . Aquatic chemistry in engineered systems: The reactions of nano-silver during washing. B. Nowack

8:30 . Complexation of III/V ions to industrial nanoparticles used in chemical mechanical polishing (CMP) process. X. Bi, P.K. Westerhoff

8:50 . Transport of oxidized multi-walled carbon nanotubes through silica based porous media: Investigation of removal mechanisms and mathematical modeling. W.P. Ball

9:15 . Light-independent redox reactions of graphene oxide in water. C.T. Jafvert, Y. Zhao

9:40 Intermission.

9:55 . Adsorption of Ca^{2+} on graphene oxide and significant effect on its colloidal stability. A. Terracciano, J. Zhang, C. Christodoulatos, F. Wu, X. Meng

10:15 . Molecular framework for *Anastrepha* pheromone communication results from abiotic environmental hydrolysis of the lipophilic terpenoid, suspensolide. S.S. Walse


11:00 . Structure-reactivity relationships for cobalt-catalyzed defluorination of perfluorinated organic compounds in water. J. Liu, X. Xiao, Y. Fang, L. Ferguson, C.P. Higgins, C. Schaefer, T.J. Strathmann

Chemistry of Environmental Sorptive & Oxidative Processes: Symposium in honor of Joseph J. Pignatello

A. MacKay, M. Sander, B. Xing, Organizers
F. Xiao, D. Zhao, Organizers, Presiding

8:00 Introductory Remarks.

8:10. Advances in the field of advanced oxidation processes for the treatment of cyanotoxins, pharmaceuticals and other contaminants of emerging concern. D.D. Dionysiou


9:10. Activated permanganate: A new advanced oxidation process?. P.G. Tratnyek, X. Guan, S. Bo

9:40 Intermission.


10:25. Novel nanomaterials for environmental pollutant sensing, and destruction, and renewable energy production. Y. Chen

10:55. Oxidative formation of environmentally persistent free radicals under environmentally relevant conditions. U.G. Nwosu, R.L. Cook

11:25. Role of reactive species in degradation of emerging contaminants under UV/chlorine and UV/peracetic acid conditions. C. Huang, P. Sun, M. Cai

Formation & Transformation of Atmospheric Aerosols: Air Pollution to Climate Change: Symposium in honor of Professor Renyi Zhang

Atmospheric Observations & Health Impacts

M. Hu, A. Khalizov, V. K. Sharma, Y. Wang, Organizers
E. C. Fortner, M. Levy, Presiding

8:00. Influence of traffic on the black carbon concentration: Investigations in Leipzig, Germany, and La Paz, Bolivia. A. Wiedensohler

8:25. Space-based observations of the chemical lifetime and emission rate of NOx: Measuring the role of winds in non-linear chemistry. R.C. Cohen

9:10 . Reduction in local ozone levels in urban São Paulo due to a shift from ethanol to gasoline use. **F. Geiger**, A. Salvo

9:35 . Identifying sources of high PM$_{2.5}$ concentrations in the West Silver Valley of Idaho, USA. **R. Li**, R. Kotchenruther, R. Hardy

9:55 Intermission.

10:10 . Air pollutants and human health: What have we learned so far?. **M. Levy Zamora**, R. Zhang


11:30 . Health effects of fine particles (PM$_{2.5}$) in ambient air. **T. Zhu**, Y. Han

Section D

**Innovative Materials & Technologies for Environmental Sustainability**

**Approaches for Renewable Energy & Water Resources**

Cosponsored by CEI
J. C. Crittenden, Q. Li, W. Zhang, *Organizers, Presiding*

8:00 Introductory Remarks.


8:25 . Functional polymers from wood-based sustainable resources. **H. Liu**, **H. Chung**

8:45 . Polyethyleneimine impregnated nano-silica used for CO$_2$ capture from flue gas. **K. Li**, J. Jiang, **F. Yan**


9:25 Intermission.
9:40. Bio-oil recovery & CO₂ recycling by waste stream enhanced microalgal growth & low energy CO₂-assisted extraction. P. Champagne

10:05. Modeling energy loss in membrane capacitive deionization systems with a high resolution one-dimensional equivalent circuit. X. Shang, K.C. Smith, R.D. Cusick

10:25. Novel hybrid zirconium oxide nanoparticles for concurrent defluoridation and desalination: Field level demonstration. M.S. German, J. Li, A. Sengupta


11:45 Concluding Remarks.

Chemistry of Biomass Wastes Conversion to Energy & Chemicals

Cosponsored by ENFL
A. Abbas, S. Spatari, Organizers
M. Tu, M. Zhao, Organizers, Presiding

8:30. Hydrothermal carbonization (HTC) of organic fraction of municipal solid waste (OFMSW) pulp and anaerobically treated OFMSW digestate. M. Reza, K. Holtman, C. Coronella


10:10 Intermission.


11:05 . Repeated-batch fermentation of microalgal biomass for high yield bioethanol employing immobilized *Saccharomyces cerevisiae*. M. Eldalatony, S. Saha, S. Chang, B. Jeon


11:45 . Anaerobic digestion of renewable materials for biogas production: Experimental stage to the field. O.O. Adetule

Section F

Elements Old & New: Discoveries, Developments, Challenges & Environmental Implications

Cosponsored by CEI, HIST and NOM
T. C. Williamson, *Organizer*
M. A. Benvenuto, *Organizer, Presiding*

8:30 Introductory Remarks.

8:35 . Lost elements: The periodic table’s shadow side. M. Orna

9:05 . History of the element concept. R. Barth

9:25 . Experimenting with the elements. M.A. Thomson


10:05 . Noble gases and the periodic table: A study in mutual reinforcement. C.J. Giunta

10:25 Intermission.

10:35 . Next generation elements. L.H. Kolopajlo


11:15 . Element 118: Teaching a new element to new students. G. Nguyen, J. Pothoof, D. Archey, P. Venugopal, M.A. Benvenuto

11:35 . Periodic table from chemical compounds. G. Restrepo

Section G

Water Purification Systems

Cosponsored by CEI
S. Ahuja, *Organizer, Presiding*

8:00 Introductory Remarks.

8:05 . Solving problems of arsenic contamination of groundwater. S. Ahuja
8:30. Transforming the global arsenic crisis into an economic enterprise: Role of hybrid anion exchange nanotechnology (HAIX-nano). M.S. German, J. Li, A. SenGupta

8:55. Reactive ion exchange-assisted high removal capability for trace Cr(VI) removal. S. Sarkar, R. Verma, A. SenGupta


9:45 Intermission.

10:05. Bromine radical species reaction under advanced oxidation process condition. A. Lechner, S.P. Mezyk


11:20. Cactus goo removes different pollutants to clean water. N. Alcantar, A. Buttice, D. Fox, R.G. Toomey, D. Stebbins, T. Peng, F. Guo

Section H

Combined Biological-Chemical Reactions for Contaminant Transformation

Cosponsored by AGRO
E. J. Bouwer, K. T. Finneran, Organizers, Presiding

8:00 Introductory Remarks.

8:05. Mechanism and applications of black carbon-mediated microbial contaminant transformation. Y. Yu, J.M. Saquing, P.T. Imhoff, P. Chiu

8:25. Heavy metal remediation via biologically driven calcium carbonate precipitation. E. Lauchnor, N. Zambare, R. Gerlach

8:45. Microbial response to antimony contamination in severely antimony-contaminated environments and bioremediation thereof by an onsite field-scale bioreactor. W. Sun, V. Krumins, E. Xiao, Y. Dong, T. Xiao


9:25. Sustainable technologies for mine influenced water treatment in different water chemistry. S.R. Al-Abed, P. Pinto, J. McKernan

9:45 Intermission.

10:00. Biofilm covered activated carbon particles enhance bioremediation of polychlorinated biphenyl (PCBs) in sediment. B.V. Kjellerup, S.J. Edwards, A.L. Prieto
10:20. Transformation of carbon tetrachloride and chloroform by tetrachloroethylene and trichloroethene respiring anaerobic mixed cultures. K. Vickstrom, M.F. Azizian, L. Semprini


11:00. Electrically conductive particles supporting direct interspecies electron transfer in anaerobic microbial communities. Q. Cheng, C. Murray, D.F. Call

11:20. Microbial reductive dechlorination of selected PCB tracker pair congeners in the Hudson and Grasse River sediment microcosms without nutrients amendment. Y. Xu

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Chemistry, Safety & Technology of GMO Foods. Sponsored by AGFD, Cosponsored by AGRO, CEI†, COMSCI and ENVR‡

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Agrochemicals & Pollinators: Current Science & Risk Assessment Approaches. Sponsored by AGRO, Cosponsored by AGFD, ENVR and TOXI

Innovative Chemistry & Materials for Electroenergy Production & Storage / Flow Batteries & Non-Li Alkali Metal Batteries. Sponsored by ENFL, Cosponsored by ENVR and MPPG

2D Materials: Graphene & Beyond & their Device Applications. Sponsored by ENFL, Cosponsored by ENVR

Advances in Chemistry of Energy & Fuels / Catalysts & Nanoparticles in Energy Conversion. Sponsored by ENFL, Cosponsored by ENVR and MPPG

TUESDAY AFTERNOON

Aquatic Chemistry: Symposium in honor of Professor Alan T. Stone

Interfaces of Organic, Inorganic & Surface Chemistry in Natural & Engineered Systems

B. Deng, C. Huang, T. J. Strathmann, D. Vasudevan, Organizers
B. Novack, Presiding

1:30 Introductory Remarks.

1:35. TiO₂ facets determine arsenic adsorption and photo-oxidation. C. Jing, L. Yan
1:55 . Spectroscopic and DFT study on arsenic removal using lanthanum-impregnated activated alumina. Q. Shi, C. Jing, X. Meng


2:55 . Increased reductive dechlorination of chlorinated hydrocarbons in surface-mediated Fe(II) associated with goethite by adding low concentration of quinine moieties. R. Maithreepala, S. Haderlien

3:15 Intermission.


3:55 . Laccase-mimicking activity of manganese oxide nanomaterials for pollutant conversion. X. Wang, Z. Wang, Q. Huang

4:15 . Aquatic chemistry of cyanobacteria threats- assessment of the release of taste and odor compounds and toxins from cyanobacteria through drinking water treatment oxidants. C. Moldaenke, B. Santiago, A. Dahlhaus, S. Kuppers, P.L. Schorr

4:35 . Mechanisms and products of BPA oxidation by Mn(IV) oxide. M.A. Ginder-Vogel, S.J. Balgooyen, C.K. Remucal

4:55 . Phosphorus recovery from anaerobic digester effluents by using dolomite lime. J. Ge, Y. Song, X. Liu, X. Meng

5:15 Closing Remarks.

Section B

Chemistry of Environmental Sorptive & Oxidative Processes: Symposium in honor of Joseph J. Pignatello

A. MacKay, M. Sander, B. Xing, Organizers
F. Xiao, D. Zhao, Organizers, Presiding


2:00 . Degradation of organic contaminants by free radicals in biochars. B. Pan, J. Yang, M. Wu, X. Dong, J. Peng, B. Xing


3:00 Intermission.


4:15. Interactions of metallic species with thermally air-oxidized black carbon (char) in the presence of soil organic matter. F. Xiao, R. Hanson, N. Lindstrom

4:40. Heterogeneous Fenton reaction at circumneutral pH: Myths and facts. A. Pham

5:05. Photochemical processes in estuarine and coastal waters. K.M. Parker, W. Mitch

Section C

Nanotechnology for Environmental Solutions & Remediation

M. Cledon, K. D. Hristovski, Organizers
D. Barcelo, Organizer, Presiding

1:30. Nanotechnology for value-addition and decontamination. S. Brar

2:00. Antibacterial $\text{T}_{13}\text{C}_2\text{T}_X$ MXene nanosheets: Towards advanced wastewater treatment membranes. K. Rasool, M. Helal, A. Ali, C. Ren, Y. Gogotsi, K.A. Mahmoud


3:40 Intermission.


4:20. High fluoride removal capacity by hybrid anion exchanger dispersed with hydrated zirconium oxide nanoparticles synthesized through a novel route. S. Naskar, S. Sarkar

4:45. Simultaneous removal of fluoride and nitrate by ion exchange media impregnated with alumina nanoparticles. J. Markovski, K.D. Hristovski, P.K. Westerhoff


Section D
Applied Catalysis for Environmental Applications

A. Savara, S. Zhao, Organizers
A. Orlov, Organizer, Presiding

1:30 Introductory Remarks.


2:05 In situ XANES/EXAFS and DRIFTS studies on CO2 photoreduction with H2O by Cu/TiO2 photocatalyst. Y. Li, L. Liu, J. Miller

2:35 Silver-inserted zinc rhodium oxide and bismuth vanadium oxide for overall water-splitting under red light. H. Irie

3:05 Hot electrons generated from upconversion process in doped quantum dots for enhanced photocatalysis. D.H. Son

3:30 Intermission.


4:45 Triplet-triplet annihilation upconversion for semiconductor photocatalyst sensitization using sub-bandgap photons: Initial successes and applications in environmental remediation. A.L. Hagstrom, H. Kim, C. Li, J. Kim

5:05 Concluding Remarks.

Chemistry of Biomass Wastes Conversion to Energy & Chemicals

Cosponsored by ENFL
A. Abbas, M. Zhao, Organizers
S. Spatari, M. Tu, Organizers, Presiding

1:30 Alkaline thermal treatment of Biomass to produce high purity H2 with in-situ carbon capture. H. ZHOU, A.A. Park

1:50 Exploration of Na2ZrO3 as both CO2 acceptor and reforming catalyst for hydrogen production from biomass gasification. M.H. Memon, H. Zhuo, M. Zhao

2:10 Pseudo-component method to predict interaction features of biowaste and plastics. Y. Long, H. ZHOU, A. Meng, Q. Li, Y. Zhang

2:30 Pyrolysis characteristics of 18 kinds of biomass waste. Y. Long, A. Meng, H. ZHOU, L. Qin, Y. Zhang, Q. Li
2:50 Intermission.


3:25. Design of co-gasification of dried sludge and woody biomass for synthesis gas production in a fixed bed downdraft gasifier using ASPEN PLUS. **V.S. Sikarwar, M. Zhao**

3:45. Exploiting the catalytic activity of clay minerals on in situ upgrading of pyrolysis biofuels with simultaneous production of heterogeneous adsorbents for water treatment. **G. Dou, J.L. Goldfarb**


4:25. Transformation of nitrogen and phosphorus during (hydro)thermal treatments of biosolids. **R. Huang, Y. Tang**

Section F: Elements Old & New: Discoveries, Developments, Challenges & Environmental Implications

Cosponsored by CEI, HIST and NOM
T. C. Williamson, Organizer
M. A. Benvenuto, Organizer, Presiding

1:30. Natural history of the periodic table of (available) elements. **B.J. McFarland**

2:00. Rare earth elements: Purification, sustainability and recycling. **E.J. Schelter, B. Cole, P. Carroll**

2:20. Analytical methodologies for arsenic, selenium and mercury: A historical perspective. **L.H. Kolopajlo**

2:40. It's all in the sludge: Elements that are always byproducts. **M.A. Benvenuto, G. Nguyen, J. Pothoof**

3:00. Mobility of naturally-occurring radioactive materials (NORM) in bit cuttings from unconventional drilling operations. **E. Eitrheim, A. Nelson, T. Forbes**

3:20 Intermission.

3:30. Where do metals come from? Using the context of portable electronics in general chemistry curricula. **B.D. Fahlman**


4:30. Palladium: The word, the element, and its place in society. **G.W. Ruger**

4:50 Concluding Remarks.
Water Purification Systems

Cosponsored by CEI
S. Ahuja, Organizer, Presiding


1:55. Rate constant determination for alkyl nitrates and oxidizing radicals utilized in advanced oxidative processes. S. Arciva, B. Daws, S.P. Mezyk, M.P. Schramm


2:45. Application of bromine (HOBr/OBr−) for saltwater disinfection. Y. Jung, Y. Jung, J. Kang

3:10 Intermission.

3:30. Selective silica separations from waste water using ion-exchange media. K. Sasan, P. Brady, T.M. Nenoff

3:55. Graphene oxide/magnesium(Hyd)oxide nanocomposites as superior sorbents for methylene blue removal from aqueous solutions. M. Heidarizad, S.S. Sengor


4:45. Determination of nitrate anion in waste water from nine selected areas of coastal Guyana via a spectrophotometric method. R.C. Jagessar

5:10 Concluding Remarks.

C. Ellen Gonter Graduate Student Awards

T. Anderson, Organizer, Presiding

1:30 Introductory Remarks.


2:00. Development of polymer-iron oxide hybrid nanofiber networks for metal sequestration in point-of-use water treatment applications. K. Greenstein, G. Parkin, D.M. Cwiertny

2:25. Seasonal and spatial variabilities in the water chemistry of prairie pothole wetlands influence the photoproduction of reactive intermediates. A.J. McCabe, W. Arnold
2:50  Chlorination revisited: Does Cl⁻ serve as a catalyst in the chlorination of phenols?  S. Lau, S. Abraham, A. Roberts

3:15 Intermission.

3:30  Halogen radicals as an unrecognized source of marine photo-oxidants in coastal waters.  K.M. Parker, W. Mitch


4:20  Sorption of dioctyl sodium sulfosuccinate to coastal Gulf of Mexico sediment.  B.S. Adewale, B.J. Brownawell

Experimental Studies of the Molecular Scale Processes at Environmental Interfaces / Interface Structure & Oxides.  Sponsored by GEOC, Cosponsored by ENVR

Green Chemistry Innovations & Opportunities in Industry for Young Professionals.  Sponsored by I&EC, Cosponsored by CATL, CEI, CHAS, ENFL, ENVR, ORGN, POLY, PROF and YCC

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2D Materials: Graphene & Beyond & their Device Applications.  Sponsored by ENFL, Cosponsored by ENVR

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Environmental Risk Assessment of Down-the-Drain Chemicals.  Sponsored by AGRO, Cosponsored by ENVR

Environmental Study Design: Current & Emerging Guidelines.  Sponsored by AGRO, Cosponsored by ENVR

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Increasing the Value of Water Monitoring Data for Pesticide Fate & Effects Evaluations. Sponsored by AGRO, Cosponsored by ENVR and TOXI

Advances in Chemistry of Energy & Fuels / Batteries. Sponsored by ENFL, Cosponsored by ENVR and MPPG

WEDNESDAY MORNING

Nanomaterials in the Environment & Biological Systems

Physicochemical & Biological Processes Affecting Their Transformation & Transport

W. H. Lee, P. Yi, Organizers
S. Joo, Organizer, Presiding

8:30. Detection and quantification of engineered nanoparticles from water and wastewater using modified silica microspheres. X. Wei, S. Brenner, M. Carpenter

8:55. Role of aspect ratio on gold nanomaterial transport through saturated porous media. D. Das, A. Hornstra, N. Burrows, C.J. Murphy, P.J. Vikesland, N.B. Saleh

9:20. Release of carbon nanotubes from polypropylene-carbon nanotube composites by solar-induced weathering. E. Sahle-Demessie, C. Han, A. Zhao, H. Grecsek

9:45. Development of model systems to explore potential mass transfer from nanotechnology-enabled plastics into foods and the environment. K. Pillai, P. Gray, A. Bajaj, R. Bleher, C. Tien, L. Sung, T.V. Duncan

10:10. Intermission.

10:25. Influence of surface functional groups on the degradation of graphene nanomaterials in the aquatic environment. I. Chowdhury, L.M. Guiney, M. Hersam


11:15. Investigating interfacial reactions of nano-ZnO particles with contaminants. S. Joo, S. Seo, M.R. Knecht, R. Lawrence, C. Su

11:40. Monitoring the mass distribution during silver nanoparticle transformations in simulated environmental media. J.M. Pettibone
Chemistry of Environmental Sorptive & Oxidative Processes: Symposium in honor of Joseph J. Pignatello

A. MacKay, M. Sander, B. Xing, D. Zhao, Organizers
F. Xiao, Organizer, Presiding

8:00 Introductory Remarks.

8:10 . Activated carbon-mediated alkaline hydrolysis of alkyl halides (methyl bromide). H. Hsieh, J.J. Pignatello

8:35 . Adsorption and desorption of organic compounds by humic acid-coated carbon nanotubes. W. Wu, B. Xing

9:00 . Nanoparticles of pyrogenic carbonaceous material: Characterization and interactions with engineered nanoparticles. P. Yi, J.J. Pignatello

9:25 . Regulation of morphological wrinkles and folds on activated graphene nanosheets for high-efficient removal of hydrophobic organic contaminants. J. Wang, B. Chen, B. Xing

9:50 Intermission.


10:30 . Cation-Pi interaction: An unnegligible interaction for ionizable compounds’ sorption on pyrogenic carbonaceous materials. Q. Zhao

10:55 . H/C atomic ratio as a mediate parameter between pyrolysis temperature, aromatic cluster and sorption ability of biochar to naphthalene and phenanthrene. X. Xiao, B. Chen

11:20 . As (V) removal by activated iron powder enhanced by amorphous iron oxides in simulated wastewater. L. Xu, Y. Huang

Section C

Nanotechnology for Environmental Solutions & Remediation

D. Barcelo, M. Cledon, Organizers
K. D. Hristovski, Organizer, Presiding

8:00 . Recyclable magnetic Co-ferrite nanoparticles for the removal of 2-phenylbenzimidazole-5-sulfonic acid (PBSA) in water. A. Al Anazi, W. Abdelraheem, C. Han, L. Sygellou, M. Arfanis, P. Falaras, D.D. Dionysiou

8:25 . Adsorption of phenanthrene by superfine powdered activated carbon and electrospun polystyrene nanofiber composites. O.G. Apul, N. Hoogesteijn, D. Ladner, P.K. Westerhoff

9:15. Methylation of hemoglobin to enhance flocculant performance. M. Essandoh, R.A. Garcia, G. Strahan

9:40 Intermission.

9:55. Nanoparticle-supported lipid bilayers as an in-situ remediation strategy for persistent organic contaminants in the soil environment. P. Garlapati, S.L. Wunder, B. Kim


10:45. Metabolic responses of Mytilus galloprovincialis to fullerene soot in microcosms exposure experiments. D. Barcelo, J. Sanchis, M. Farre


11:35. Nanoparticle effects on plants. T. Vanek, P. Landa

Section D

Applied Catalysis for Environmental Applications

A. Savara, S. Zhao, Organizers
A. Orlov, Organizer, Presiding

8:00 Introductory Remarks.

8:05. Mathematical modeling and simulation of a non-isothermal photocatalytic solar CPC reactor: Effect of the temperature on the kinetic of reaction rate. M. Mueses, F. Machuca-Martinez, M. Molano-Mendoza


8:45. Nano-sized ruthenium compound as a true catalyst for water oxidation in the reaction of ruthenium red and cerium (IV) ammonium nitrate. A. Shirazi Amin, M. Najafpour, B. Sarvi, S. Hosseini, B. Deljoo, A. El-Sawy, M. Aindow, S.L. Suib

9:05 Intermission.


10:25. Catalytic hydrodechlorination of triclosan using resin supported palladium. D. Zhao, B. Han, J. Wang, J. Li

11:20. Microbial synthesis of Pd/Fe₃O₄, Au/Fe₃O₄ and PdAu/Fe₃O₄ nanocomposites for catalytic reduction of nitroaromatic compounds. **T. Ya**

11:40 Concluding Remarks.

**Section E**

**Chemistry of Biomass Wastes Conversion to Energy & Chemicals**

Cosponsored by ENFL
A. Abbas, M. Tu, M. Zhao, *Organizers*
S. Spatari, *Organizer, Presiding*

8:30. Valorisation of biomass derivatives *via* cross metathesis to PET precursor compounds. **E. Saraci**, L. Wang, K.H. Theopold, R.F. Lobo


9:30. Co-adsorption behavior of perfluorochemicals(PFCs) and hexavalent chromium anions on aminated wheat straw. **T. Zhao**, X. Yao

9:50 Intermission.


11:05. Improvement of the treatment effectiveness of heavy metals with energy sunflower plants with calcium peroxide and phytohormones. **T. Yeh**

Microbial & Molecular Tools to Determine the Fate & Biotransformation of Emerging Contaminants

Cosponsored by AGRO
U. Tezel, Organizer
B. Z. Haznedaroglu, S. G. Pavlostathis, Organizers, Presiding

8:00 Introductory Remarks.

8:05. Combining high throughput omics tools with targeted DNA, RNA and protein quantification techniques to model respiration rates of specific organohalide contaminants by *Dehalococcoides* strains. **R. Richardson**, G.L. Heavner, C. Mansfeldt, A. Rowe, J.J. Werner

8:50. Biomarkers for validating 1,4-dioxane biodegradation in contaminated groundwater. **P. Gedalanga**, S. Zhang, Y. Miao, S. Mahendra

9:15. Catabolic biomarkers for sensitive and fast quantification of 1,4-dioxane biodegradation activities at impacted aquifers. **M. LI**, Y. Liu, Y. He, Y. Yang, J. Mathieu, P.J. Alvarez

9:40 Intermission.

10:00. Understanding the metabolism of 4-OH-2',5'-dichlorobiphenyl by the model plant *Arabidopsis thaliana* using whole-genome expression microarrays. **B. Van Aken**, S. Subramanian


Disinfection By-Products: What Have We Learned about Dissolved Organic Matter Precursors?

Financially supported by AEESP
L. M. Blaney, O. Keen, J. A. Korak, Organizers
A. T. Chow, M. Gonsior, H. Liu, Organizers, Presiding

8:00 Introductory Remarks.


9:00 . Enhanced aromatic carbon loading, DBP formation potential, and hydrologic variability following beetle-induced tree mortality. **B. Brouillard**, E. Dickenson, K. Mikkelson, J. Sharp

9:25 . Microbial diversity and DBP formation potential of biofilms harvested from different pipe materials. **H. Tung**, G. Wang

9:50 Intermission.


11:00 . Predicting trihalomethane formation using classification trees. **L. Strahs**, M.J. Small, J. Wilson, J.M. Vanbriesen


**Recent Advances in Remediation Strategies & Technologies for the Cleanup of Hazardous Waste Sites**

E. R. McKenzie, **Organizer**
A. Pham, **Organizer, Presiding**

8:00 Introductory Remarks.

8:10 . Major characteristics and challenges of treatment of high pH, high Si groundwater at a contaminated site in western Washington. **G. Korshin**, M.M. Benjamin


9:50 Intermission.


11:25. Fouling mechanism and control strategies during microfiltration of inorganic colloids. R. Malaisamy, R. Rollock, Y. Fennell, K.L. Jones

Experimental Studies of the Molecular Scale Processes at Environmental Interfaces

Redox. Sponsored by GEOC, Cosponsored by ENVR

USA-China Symposium on Energy. Sponsored by ENFL, Cosponsored by ENVR

Chemistry, Safety & Technology of GMO Foods. Sponsored by AGFD, Cosponsored by AGRO, CEI¹, COMSCI and ENVR²

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2D Materials: Graphene & Beyond & their Device Applications. Sponsored by ENFL, Cosponsored by ENVR

Advances in Chemistry of Energy & Fuels / Batteries, CO2 Capture, Pyrolysis Modeling & Others. Sponsored by ENFL, Cosponsored by ENVR and MPPG
WEDNESDAY AFTERNOON

Nanomaterials in the Environment & Biological Systems

Physicochemical & Biological Processes Affecting Their Transformation & Transport

S. Joo, P. Yi, Organizers
W. H. Lee, Organizer, Presiding

1:30 . Comparative toxicity effects of carboxylated carbon nanotubes to fresh water and marine algae. **M. Thakkar**


2:20 . Uptake, distribution, and effects of nano alumina in terrestrial plants at the cellular and macro-scale levels. **J. Mui, K. Hayes, B. Kim**


3:10 Intermission.


3:50 . Activated sludge microbial community response to variations in gold nanoparticle morphology and surface coating. **J. Metch, P.J. Vikesland, C.J. Murphy, N. Burrows, A. Pruden**

4:15 . Impacts of silver nanoparticle transformations on *Pseudomonas Aeruginosa GFP* biofilm. **T. ADEGBOYE, K.L. Jones, P. Ymele-leki, M. Ramamoorthy, Y. Fennell**

4:40 . Electrochemical micro/nano-sensor for *in situ* monitoring of nutrients and chemical compounds in engineered and natural aquatic systems. **W.H. Lee, X. Ma, J. Church**

Chemistry of Environmental Sorptive & Oxidative Processes: Symposium in honor of Joseph J. Pignatello

A. MacKay, M. Sander, B. Xing, D. Zhao, Organizers
F. Xiao, Organizer, Presiding


2:20. Laccase-catalyzed degradation of sulfadimethoxine in the presence of natural mediators. **S. Liang**, Q. Luo, Q. Huang

2:45. Enhanced aerobic diclofenac removal with sulfide modified nanoscale zero valent iron (S-nZVI) as substitute of nanoscale sero valent iron (nZVI) in nZVI/O₂ system. **Y. Su**, X. Zhou, Y. Zhang

3:10 Intermission.


4:40. Selective catalytic reduction of NO with NH₃ over MoFe/Beta catalysts: Effect of Mo loading. **J. Liu**, J. Liu, Z. Zhao

5:05. Quantum chemical investigations on oxidation pathways of PPCPs by singlet state oxygen and ozone. **S. Zhang**

**Section C**

**Nanotechnology for Environmental Solutions & Remediation**

D. Barcelo, K. D. Hristovski, *Organizers*
M. Cledon, *Organizer, Presiding*


2:45. Size effects of graphene nanosheets on the adsorption capability of three-dimensional graphene-based macrostructures. **Y. Shen**, B. Chen

3:10 Intermission.

3:30. From coal fly ash to ordered mesoporous nano-silica: A novel twice-carbonation strategy. **F. Yan**, J. Jiang, M. Zhao, Y. Xu

4:20. Reprogrammable multiplexed visual detection of mercury and silver ions with picomolar sensitivity. M. Rana, M. Balcioglu, M.V. Yigit

4:45. Microplasma-assisted rapid synthesis of luminescence nitrogen-doped carbon dots for uranium detection. Z. Wang, Y. Lu, J. Chen

Section D

Applied Catalysis for Environmental Applications

A. Orlov, A. Savara, S. Zhao, Organizers
S. Zhao, Presiding


1:55. Sodium carbonate optimized dual functional material for CO₂ adsorption and catalytic conversion to methane. S. Wang, R.J. Farrauto, D. Eida

2:20. Application of Pt@CeO₂ core/shell structures for low temperature oxidation of CO and CH₄. S.P. Phivilay, K. Takanabe, P. Fornasiero

2:45. Pt-Based nanotube structures without carbon supports for fuel cell catalysts. S. Kim, S. Park

3:10 Intermission.


3:50. Waste reduction in a continuous bulk polymerization process with chemistry that matters. D. Li, G. Flowers

4:15. Solar photocatalytic degradation of emergent contaminants in a pilot-scale CPC reactor. J.A. Colina-Marquez, M.A. Mueses

4:40. Chitosan/hydroxyapatite/Fe₃O₄ magnetic composite for metal-complex dye AY220 removal: Recyclable metal-promoted fenton-like degradation. L. Wu, K. Xu, X. Hou

5:05 Concluding Remarks.

Section E

Creating & Exploiting Salinity Gradients

C. Gorski, B. E. Logan, M. S. Mauter, Organizers, Presiding

1:30 Introductory Remarks.

1:40. Salinity gradient energy with PRO, RED, and CapMix: Prospects, progress, and challenges. N. Yip


2:50. Net energy output of salinity gradient power generation with pressure-retarded osmosis: What configurations are feasible?. **A. Straub**, A. Deshmukh, M. Elimelech


3:30. Intermission.

3:50. Specific ion effects in charged polymer membranes. **Y. Ji**, G.M. Geise


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**Microbial & Molecular Tools to Determine the Fate & Biotransformation of Emerging Contaminants**

Cosponsored by AGRO

B. Z. Haznedaroglu, S. G. Pavlostathis, *Organizers*

U. Tezel, *Organizer, Presiding*


2:15. Biotransformation and inhibitory effect of furanic and phenolic compounds in the anode of a microbial electrolysis cell (MEC). X. Zeng, M.A. Collins, A. Borole, **S.G. Pavlostathis**

2:40. Microbial transformation of tetracycline and sulfonamide antibiotics. **X. Li**, Y. Leng, R. Levine, Y. Zhang, J. Bao, D.D. Snow, L. Durso

3:05. Intermission.

3:50. Effects of residual antibiotics in groundwater on survival and pathogenicity of *Salmonella*. B.Z. Haznedaroğlu, S.L. Walker

4:15 Concluding Remarks.

Section G

**Disinfection By-Products: What Have We Learned about Dissolved Organic Matter Precursors?**

Financially supported by AEESP
A. T. Chow, M. Gonsior, H. Liu, *Organizers*
L. M. Blaney, O. Keen, J. A. Korak, *Organizers, Presiding*

1:30 Introductory Remarks.


2:00. Ternary model to quantitate the speciation of chlorine, bromine and iodine containing trihalomethanes. **G. Korshin**, M. Yan


2:50. Rational modifications of quaternary ammonium polymer coagulants to Mitigate *N*-nitrosamine formation. **T. Zeng**, W. Mitch

3:15 Intermission.


4:00. Use of an online LED UV fluorescence sensor for high time resolution DOM monitoring and predicting DBPs formation potential during water treatment. **W. Li**, M. Cao, M. Dodd, A. Li, G. Korshin


4:50. Structure-property relationships between fulvic and humic acid sorbates and activated carbon sorbent. **M.J. Wells**, M.Y. Abouleish

5:15 Concluding Remarks.

Section H

**Recent Advances in Remediation Strategies & Technologies for the Cleanup of Hazardous Waste Sites**

A. Pham, *Organizer*
E. R. McKenzie, *Organizer, Presiding*

2:10  Kinetics and efficiency of contaminant oxidation by heat-activated persulfate: Implications for in situ remediation by EK-TAP technology. A. Pham, N. Zrinyi, M. Kondakow

2:30  Cometabolism of 1,4-dioxane and chlorinated solvent mixtures by *Rhodococcus rhodochrous* grown on isobutane. S. Thankitkul, S. Rich, M. Azizian, M. Hyman, L. Semprini

2:50  Headspace GC/PID for on-site screening of soil and water at hazardous waste sites. J.N. Driscoll, J.L. Maclachlan

3:10  Oxidative remediation of per- and polyfluoroalkyl substances. T. Bruton, D. Sedlak

3:30  Intermission.

3:50  Perfluoroalkyl acid (PFAA) transport in saturated porous media as affected by chemical oxidants and trichloroethylene (TCE). E.R. McKenzie, R.L. Siegrist, J.E. McCray, C.P. Higgins

4:10  Intramolecular transformations in fluorochemicals probed by chemical computations. D.J. Van Hoomissen, S. Vyas

4:30  Development of a novel time-release mechanism for water treatment polymer to promote sorption of perfluoroalkyl substances in groundwater environments. M. McCarty, M.F. Simcik, W. Arnold

4:50  New green remediation technology Ultrasound-assisted supercritical extraction applied to soil remediation. T. Castelo-Grande, P.A. Augusto, A.M. Estevez, D. Barbosa

5:10  Concluding remark.

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Computational Chemistry & Toxicology in Chemical Discovery & Assessment (QSARs). Sponsored by AGRO, Cosponsored by COMP, ENVR and TOXI

Innovative Chemistry & Materials for Electroenergy Production & Storage / Li-Ion & Li-O2 Batteries. Sponsored by ENFL, Cosponsored by ENVR and MPPG
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Advances in Chemistry of Energy & Fuels / Production, Refinery & Storage of Fuel Compounds. Sponsored by ENFL, Cosponsored by ENVR and MPPG

WEDNESDAY EVENING

Section I

Advances & Challenges in Food-Energy-Water Nexus

Cosponsored by AGRO and CEI
S. Ahuja, S. Chae, I. Chowdhury, D. D. Dionysiou, Y. Lin, Organizers

6:00 - 8:00

. Interaction forces between microalgae cells and membrane surface based on XDLVO theory in algae harvesting using axial vibration membrane. F. Zhao, Y. Zhang, H. Chu, X. Zhou


. Water quality and public health: Role of wastewater. T. Tongesayi, S. Tongesayi


Section I

Advances in Innovative Designs & Process Cost Estimation Techniques for Advanced Water Purification Technologies

Y. G. Adewuyi, E. Sahle-Demessie, Organizers

6:00 - 8:00

. Modification of polysulfone (PSF) hollow fiber membrane (HFM) with zwitterionic or charged polymers for water purification. P. WAN, M. Bernards, B. Deng

. 1,4-Dioxane removal in flow-through water treatment system using combined ozone and ultrasound. M. Dietrich, R.C. Smith, G. Andalari, R.P. Suri
Advances in Understanding Antibiotics, Antibiotic Resistance Genes & Antibiotic-Resistant Bacteria in Engineered & Natural Environments

Cosponsored by AGRO
K. Chu, C. Huang, J. McLain, Organizers

6:00 - 8:00

. Photocatalysis of triclosan and triclocarban by tetrapod zinc oxide and nitrogen-doped reduced graphene oxide. M. Hwangbo, B.S. Abada, Y. Shao, K. Chu


. Photolytic fate of poultry antibiotics in agricultural wastewater. K. Mangalgiri, L.M. Blaney

. Identification of fluoroquinolone antibiotics and resistant bacteria in Indian sewage treatment plants. J. K, P. Sihag, P. Jaroliya, P. Mandal, S. Sarkar


Advances in Understanding PPCP Fate in Wastewater Collection & Treatment Systems

N. Fahrenfeld, L. A. Rodenburg, Organizers

6:00 - 8:00


. Adsorption of pharmaceuticals in columns packed with palygorskite-montmorillonite clay particles. N.D. Danielson, T. Berhane, M.P. Krekeler, J. Levy

. Isotope-dilution extraction and analysis of priority contaminants in BNR slurry. O. Quinones, B. Vanderford, E. Dickenson
Advancing Teaching & Learning in Environmental Chemistry Courses: Innovative Tools & Techniques

Financially supported by AEESP
N. Dai, A. Shah, J. Sivey, Organizers

6:00 - 8:00

. Effect of a physical classroom demonstration on understanding of chemical equilibrium. K. Barrett

Applied Catalysis for Environmental Applications

A. Orlov, A. Savara, S. Zhao, Organizers

6:00 - 8:00

. Hybrid inorganic–organic composites of layered double hydroxides with g-C3N4 for high-efficiency removal of organic pollutants. L. Mohapatra, K. Parida


. Novel Diatom-Fe composites as catalyst for photodegradation of Rh-6G in aqueous media. M. Thakkar

. Use of metal chloride additives as Lewis Acids in the liquid phase reaction of furfural and furfuryl alcohol. S. Ogozaly, K. Marotta, L.A. Welch

. Scaling-up solar CPC photocatalytic reactors for phenol removal. J.A. Colina-Marquez, M.A. Mueses

. Degradation of methyl orange using active carbon/Fe as a heterogeneous Fenton-like catalyst. J. Liang, J. Zhang, J. Li, W. Zhang


. Transfer hydrogenation on supported palladium catalysts for reduction of aqueous contaminants. P.G. Tratnyek, B. Zhang, G. O'brien Johnson, K. Meduri, J. Jiao, C. Xu

. Ozonation of dimethyl phthalate by Fe-NiO2 in the water. J. Zhang, G. Zhang

. Commercial micro-sized ZnO catalytic ozonation for p-chloronitrobenzene degradation in water: Efficiency and reaction mechanism. X. Zhenzhen, Y. Ben, Z. Chen
Degradation of lindane and hexachlorobenzene in supercritical carbon dioxide using palladium nanoparticles stabilized in microcellular high-density polyethylene. **K. Chiu**, P. Wu

Catalytic oxidation of vinyl chloride and CO over ruthenium oxides supported on heterostructured CoPO-MCF materials. **C. Tian**

Catalytic ozonation of phenolic wastewater by ceramic supported metal oxide catalysts. **S. Lee**, L. Chang, S. Chen, K. Yu

Phytochemical approach to substitute toxic chemicals in nanotechnology. **B. Kumar**, K. Smita, L.H. Cumbal


Novel SCRPF path with the three-dimensional ordered macroporous Ce$_{0.9-x}$Zr$_x$Fe$_{0.1}$O$_2$ catalysts for the simultaneous removal of PM and NOx from diesel engines. **Y. Cheng**, J. Liu, Z. Zhao

*Section I*

**Aquatic Chemistry: Symposium in honor of Professor Alan T. Stone**

**Interfaces of Organic, Inorganic & Surface Chemistry in Natural & Engineered Systems**

B. Deng, C. Huang, T. J. Strathmann, D. Vasudevan, *Organizers*

6:00 - 8:00

Mechanism of Cr(VI) reduction by oxalic acid in the presence of Mn(II). **F. Wang**, B. Deng, C. Lin

Removal of methyl orange from aqueous solution using HJ clay-supported nanoscale zero-valent iron. **Y. Zhao**, X. Li, Q. Shi, J. Ge, B. Xi, B. Gong, R. Li

Electrochemistry of phenols, anilines, and related shuttle compounds. **A.S. Pavitt**, P.G. Tratnyek

Microbial leaching of iron from hematite into seawater mediated via Anthraquinone-2,7-disulfonate as a model of humic substance. **A. Aneksampant**, M. Fukushima

Biodegradation of diazinon using a freshwater microalga *Chlorella vulgaris*. M.B. Kurade, **J. Xiong**, B. Jeon

Reductive dechlorination of TCE and PCE by magnetite: Is it relevant?. **J.D. Culpepper**, M. Scherer, D. Latta

Sediments as an active source of contamination to Onondaga Lake in Syracuse, New York. **A. Ingham**, J.P. Hassett

Biodegradation of carbamazepine using freshwater microalgae *Chlamydomonas mexicana* and *Scenedesmus obliquus* and the determination of its metabolic fate. **J. Xiong**, B. Jeon

Effect of pH on the physicochemical properties of δ-MnO$_2$ in the dark and in the light. **F. Marafatto**, A. Schwartzberg, B. Gilbert, J. Pena

**Chemistry of Biomass Wastes Conversion to Energy & Chemicals**

Cosponsored by ENFL
C. Huang, J. McLain, M. Tu, M. Zhao, *Organizers*

**6:00 - 8:00**

- Efficient hydrogen production from pyrolysis of waste beech wood by applying multi-functional Ni/Co-CaO/SiO₂ powder in TG-MS system. **X. Cui**, X. Zhao, M. Zhao

- Study on qualitative characterization of bio-liquid from food wastes at various reaction conditions. **S. Park**, S. Lee, S. Bae

- DRIFTS, ATR and transmission FTIR sampling techniques for quantitative measurements on lignocellulose. **M. Gogna**, R.E. Goacher

- Isolation of lignin from biomass using biobased flocculants with a co-flocculant and a flocculant aid. **D.J. Piazza**, R.A. Garcia, J.H. Lora

**Chemistry of Environmental Sorptive & Oxidative Processes: Symposium in honor of Joseph J. Pignatello**

A. MacKay, M. Sander, F. Xiao, B. Xing, D. Zhao, *Organizers*

**6:00 - 8:00**

- Adsorption of nitroaromatic compounds from aqueous solution by surface silylated MCM-41. **Q. Qin**, Y. Xu, J. Ma

- Water at the ionic liquid vapor interface using ambient pressure X-ray photoelectron spectroscopy. **A. Broderick**, J.T. Newberg, Y. Khalifa


- Sonolytic and sonocatalytic decomposition of salicylic acid by high frequency ultrasound. **B. Savun**, A. Ziylan Yavas, **N.H. Ince**

- Fate and transport of common organic pollutants through water saturated cores of Berea sandstone. **S.P. Labrecque**, W. Blanford
Influence of chemical oxidation on adsorption properties of carbonaceous materials with different structures: porous structure vs. dispersible structure. H. Zhang, D. Zhang, X. Dong, J. Peng, S. Ghosh, B. Pan

Adsorption of 2-naphthalene sulfonic acid on a novel bifunctional weakly basic anion exchanger from aqueous solution. Y. Sun

Effect of frequency and specific power on sonochemical decolorization of azo-dye. A. Ziylan Yavas, Z. Eren, N.H. Ince


Section I

Combined Biological-Chemical Reactions for Contaminant Transformation

Cosponsored by AGRO
E. J. Bouwer, K. T. Finneran, Organizers

6:00 - 8:00

Enhanced dechlorinization of highly chlorinated solvents in groundwater through amendment with hydroxypropyl-beta-cyclodextrin. M.P. Pecoraro, W. Blanford

Effect of surface treatment on GAC as an electron acceptor in microbial transformation reactions. A.M. Redwan, K. Millerick

Extracellular iron reduction by the Gram-positive fermenter Clostridium beijerincki. J.K. Choi, N. Yee

Analysis of polychlorinated biphenyls in effluent discharged from a wastewater treatment plant during dry and wet weather periods. B.V. Kjellerup, R. Jing, E. Wilson, S. Fusi, A. Chan

Section I

Creating & Exploiting Salinity Gradients

C. Gorski, B. E. Logan, M. S. Mauter, Organizers

6:00 - 8:00

Enhanced capacitive deionization performance using electrodes with polysaccharide binders. M. Kim, R.D. Cusick

Fouling resistant nanocomposite cation exchange membrane with enhanced salinity gradient power generation for reverse electrodialysis. X. Tong, B. Zhang, Y. Chen
Section I

Crystal Defects on Surface Reactivity & Heterogeneous Photocatalysis

D. D. Dionysiou, R. Doong, C. Huang, H. L. Ong, Organizers

6:00 - 8:00


. Development of novel copper removal technology by fluidized-bed homogeneous crystallization(FBHC). **C. Huang**, Y. Shih, Y. Huang

. Green synthesis of multifunctional mesoporous composites from display panel glasses for selective adsorption of metal ions. **C. Tsai**, R. Doong, H. Hung


. Phosphate recovery by fluidized-bed homogeneous granulation process. **Y. Huang**, P. Caddara, F. Ballesteros, M. Lu

. Impaired water desalination using resin wafer electrodeionization: Breakthrough in energy-efficient water reclamation. **P. Tseng**, S. Pan, Y.J. Lin, C. Hsieh, P. Chiang

. 3D nanoscale imaging and photocatalytic disinfection mechanism of *E. coli* (gram-negative) and *S. aureus* (gram-positive) with modified N-doped and N-Tourmaline-doped TiO₂ composites under visible light radiation. J. Tzeng, C. Weng, Y. Huang, **Y. Lin**

. Improvement of electrochemical performance of lithium iron phosphate coated with carbon sources using rheological phase method. **C. Hsieh**, C. Chang


. Hydrothermal synthesizing Ce-doped TiO₂ photocatalysts for degradation 2-cholorphenol under visible light irradiation. J. Lin, K. Sopajaree, A. Gongglom, **M. Lu**

. Preparation, characterization and application of a Ti/SnO₂-Sb/PbO₂ electrode exemplified by the anodic degradation of reactive black 5. **S. Li**, Y. Huang, Y. Shih


. Effect of calcination temperature on structural and magnetic properties of photocatalytic TiO₂/CoFe₂O₄ nanocomposites. C. Dong, C. Chen, **C. Hung**
Preparation of β-PbO₂-coated graphite electrode for electro-oxidation of ammonia. Y. Shih, Y. Huang

Photo-electrochemical treatment of organic pollutants in the electro-fenton process. T. Chen, C. CHOU, S. Yen

Template free synthesis of ZnO doped WO₃ and undoped WO₃ catalyst for photocatalysis of perfluorooctanoic acid. S. Singh, S. Lo, M. Chen

Study on new method of TiO₂ nanorod arrays preparation and photocatalytic performance. G. Wang, Y. Shih, Y. Su

Developing International Policies for Nanoparticles in the Environment

Financially supported by IUPAC
R. Luque, S. O. Obare, Organizers

Section I

6:00 - 8:00

Effects of metal ions on the antimicrobial properties of silver nanoparticles. C. Bonner

Influence of agricultural pesticides on nanoparticle stability. N. Dissanayake, K.M. Current, S.O. Obare

Oxidation of thiaoanizoles by ZnO-Fe₃O₄-Au hybrid composite under visible light. T. Pandiyan, A. Itztani Cervantes, C. Huerta Aguilar

Environmental usage of poly(2-acrylamido-2-methyl-1-propanesulfonic acid sodium salt –co- 3-acrylamidopropil-trimethyl ammonium chloride)- Lentinus tigrinus (Bull.) Fr. composite hydrogel. D. Alpaslan, T. Ersen, S. Kubilay, Y. Uzun, A. Savran, N. Aktas

Optimization with response surface methodology of toluidine blue biosorption conditions from aqueous solutions by Polyporus squamosus (Huds.) Fr. and Lentinus tigrinus (Bull.) Fr. fungi as biosorbent. D. Alpaslan, T. Ersen, S. Kubilay, Y. Uzun, A. Kul, N. Aktas

Section I

Formation & Transformation of Atmospheric Aerosols: Air Pollution to Climate Change:
Symposium in honor of Professor Renyi Zhang

M. Hu, A. Khalizov, V. K. Sharma, Y. Wang, Organizers

Section I

6:00 - 8:00

High levels of secondary aerosols exacerbating haze in Beijing during the autumn. T. Feng, G. Li, J. Cao, W. Zhou, N. Bei

Contributions of secondary aerosols to the heavy haze formation during wintertime in China. X. Long, G. Li, X. Tie, J. Cao

Seasonal Variations of nitrate formation mechanisms in Shanghai. Y. Tao, X. Ye


. Using single-particle scattering depolarization signal to measure ice nuclei with a continuous flow diffusion chamber. **J. Zenker**, S. Brooks


. Development of an electrostatic collection-desorption electrospray ionization mass spectrometry for chemical analysis of ambient aerosols. **A. Khalizov**, Q. Zhang, D. Lazar

. Investigation of aerosol-cloud interaction at different altitude over the plateau. **X. Chou**

. Contributions of regional transport to the summertime air quality in Beijing. **J. Wu**, G. Li

. Characteristics of cloud systems over the Tibetan Plateau and East China during boreal summer. **J. Chen**, X. Wu, Y. Yin, H. Xiao

. Global climate models intercomparison of anthropogenic aerosols effects on regional climate over north Pacific. **J. Hu**, R. Zhang, B. Pan, Y. Lin, Y. Wang, Y. Ming

. Absorbing aerosol-induced changes in extratropical circulation in an atmospheric general circulation model. **Z. Shen**, Y. Ming

. Evaluation of NASA GISS Post-CMIP5 single column model simulated cloud and precipitation using the ARM SGP observations. **L. Zhang**, X. Dong, A. Kennedy, B. Xi, Z. Li

. Response of marine boundary layer cloud properties to aerosol perturbations from the 19-month AMF-Azores campaign. **J. LIU**, Z. Li, M. CRIBB

. Detection of discrete wildfire aerosol emission events as recorded in the Greenland ice sheet. **J. Kennedy**

. Anthropogenic influence on decadal aerosol trends and aerosol-cloud interactions over the western North Atlantic Ocean. **A. Jongeward**, Z. Li


. Role of wind shear at different vertical levels: Regulating aerosol impact. Q. Chen, J. Fan

. Effects of atmospheric aerosols on climate and air quality in Eastern US using a source-oriented WRF/Chem model. H. Zhang, F. Han, H. Guo

. Physiologic and epigenetic alterations in offspring following prenatal exposure to particulate matter air pollution in two strains of mice. K. Rychlik, J.C. Pulczinski, M.L. Zamora, R. Zhang, N.M. Johnson

. Validation of novel biomarkers of traffic-related ambient air pollution exposure in a susceptible south Texas population. J.C. Pulczinski, K. Rychlik, T. Ramani, T. McDonald, G. Carrillo-Zuniga, K. KOEHLER, J. Zietsman, N.M. Johnson

Section I

General Posters
D. D. Dionysiou, Organizer

6:00 - 8:00

. Potential concentrations of select trace metals from road salt corrosion. P. Pascucci

. Efforts towards understanding the natural occurrence of silver nanoparticles in the environment: How close are we?. N.F. Adegboyega, A.D. Olaitan, M. Brantley, T. Solouki, W.C. Hockaday, V.K. Sharma

. Applying differential ion-mobility spectrometry to improve LC-MS/MS analysis of emerging organic contaminants. C. Hao

. Biological transformations and toxicity of PCBs in wastewater treatment. B.V. Kjellerup, C. Draghi, S.J. Edwards, N.A. Andrade, R. Jing

. TiO\textsubscript{2} modified with WO\textsubscript{3} applied to waste of Colombian gold mining. A. Arce-Sarria, C.L. Caicedo-Rosero, F. Machuca-Martinez, J.A. Colina-Marquez

. Fabrication of magnetic nanoparticles from red mud for arsenic removal. Z. Katircioglu, S. Dursun, M. Yavuz

. Organic matter-manipulated colloid transport in porous media: A review. X. Yang

. Review of health and environmental hazards of tetrahydrofuran. O. Ogunsola

. Recent accidents in the universities laboratories: Root causes, lessons learn and prevention. E.A. Dada, K. Olanrewaju, O. Anyaegbu, E. Mogbo

. Best practices to improve laboratory safety: Implementing the CSI concepts. A. Nandedkar

. Fundamental chemistry of hydraulic fracturing fluids. O.I. Ogunsola

. Lab and field worker emergency alert and location system proposal. K. Brown, P.B. Shaw, R. Voorhees, A.R. Brandes, S. Glover, J. Snawder, M. Breitenstein

. Evaluation of multiple heavy metals and metalloids in glass beads used in retroreflective road markings. M.B. Rosen, L. Pokhrel, B. Dubey

. EPA online prediction physicochemical prediction platform to support environmental scientists. A.J. Williams, K. Mansouri, C. Grulke, J. Edwards, J. Smith, J. Foster, D. Lyons

. Degradation mechanisms of Microcystin-LR during UV photolysis and UV/H2O2 reactions: By-products and pathways. K. Zoh, B. Moon, T. Kim, M. Kim

. Use of $^{129}$I in monitoring nuclear releases to the sediments of Lake Ontario. U. Rao, M. Kruge, Y. Muramatsu, C. Blithe, M. Montemarano


. Characterization of physicochemical and toxicological properties of ceria nanoparticles. M. Baalousha


. Automated extraction and analysis of explosives in soil samples with supercritical fluids. W. Hedgepeth, K. Tanaka

. Application of solvent extraction for lithium recovery from diluted shale gas produced water. E. Jang, E. Chung, Y. Jang


. Understanding fluorescence energy transfer for toxicant detection and environmental monitoring efforts. **M. Verderame**, D.J. DiScenza, N. Serio, M. Levine


. Comparison of mercury in water analysis using cold vapor AA and gold preconcentration/PID. **J.N. Driscoll, J.L. Maclachlan**

. Low temperature catalyst for VOC abatement. **Q. Wang**, H. Chen, **L. Luk**, W. Han, K. Yeung


. Determination of Arsenic (III) using gold nanoparticles-modified screen-printed carbon electrodes immobilized with acetylcholinesterase enzyme. **D. Orefuwa**, B. Workie, E. Sahle-Demessie, T. Li

. Concentrations and toxic equivalence of polychlorinated dioxins/furans and coplanar PCBs in fillet samples of fish at nearshore locations in Lake Ontario. **J.J. Pagano**, T.M. Holsen, A.J. Garner

. Role of singlet oxygen in electrochemical disinfection of water contaminated with *E.coli*. **N. Barashkov**, T. Sakhno, V. Krykunova, I. Irgibaeva

. Leaching behavior of the boron and fluorine in fly ashes recovered from electrostatic precipitators of pulverized coal-fired plants. **N. Tsubouchi**, K. Shibuya, Y. Muto, Y. Ohtsuka

. TEPA-Loaded Stellate Mesoporous Silica Nanoparticles (Stellate MSN) for CO₂ Capture. **D. Radu**, N. Pizzi, C. Lai

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**Impacts of Energy Systems on Water Treatment**


**6:00 - 8:00**

. Tunable anion exchange to treat Marcellus flowback wastewater and recover barium using impaired acid mine drainage (AMD). **J. Li**, A. SenGupta


Section I
Innovative Materials & Technologies for Environmental Sustainability

Cosponsored by CEI
J. C. Crittenden, Q. Li, W. Zhang, Organizers

6:00 - 8:00

. Graphene-wrapped Bi$_2$O$_2$CO$_3$ core-shell structures with enhanced quantum efficiency profit from an ultrafast electron transfer process. D. Li, Y. Zhang


. Synthesis and application of a cross-linked cationic surfactant micelle for removing anions from water. M. Chen, C.T. Jafvert

. High throughput detection and identification of chemical excursions via GC-MS. P. Kaur, C.N. Stedwell, J.D. Debord


Nanomaterials in the Environment & Biological Systems

Physicochemical & Biological Processes Affecting Their Transformation & Transport

S. Joo, W. H. Lee, P. Yi, Organizers

6:00 - 8:00


. Organic-nanomaterial-aggregate and dispersion of polyaromatic hydrocarbons in water. E. Sahle-Demessie, C. Han, A. Zhao, H. Grecsek, Y. Oh, S. Chae

. Aggregation, dissolution, and sedimentation of ZnO nanoparticles in water. C. Yeh, Y. Peng, C. Hsiung, Y. Lin, Y. Shih

Insight on the CdSe/ZnS quantum dot dissolution. P. Paydary, P. Larese-Casanova

Quantitative structure-activity relationships of functionalized carbon nanotubes. R. Lougee, D. Fourches

Modulation of the physiological and biochemical effects of copper nanoparticles in kidney beans (Phaseolus vulgaris) treated with kinetin. S. Apodaca, J.R. Peralta-Videa, J.L. Gardea-Torresdey

Influence of nanoparticles of pyrogenic carbonaceous material on the colloidal stability of cerium oxide nanoparticles. P. Yi, J.J. Pignatello

Response of anaerobic granular sludge to single-wall carbon nanotube exposure. L. Li, Z. Tong

Effect of continuous AgNP addition on surface characteristics of activated sludges. A. Geyik, F. CECEN

Changes in the production of protein-EPS in an activated sludge receiving AgNP. A. Geyik, F. CECEN

Investigation of environmental quality improvement from application of natural gas. Y. Zhang, R. Li, C. Wang, Z. Gu

Section I

Nanotechnology for Environmental Solutions & Remediation

D. Barcelo, M. Cledon, K. D. Hristovski, Organizers

6:00 - 8:00

Chemical-free removal of aqueous zinc by underwater plasma discharge. Y.H. Lee, A.N. Saqib

Nanoselenium sponge technology for mercury removal from water. S. Ahmed, J. Brockgreitens, A. Abbas

Evaluation of cyclodextrin modified zeolites as sorbent for removal of common organic rollutants from water streams. W. Blanford, B. Sang, S. Mai

Goethite/silica nanocomposite effective at adsorption of arsenic (V) from aqueous solutions. R. Attinti, D. Sarkar, K. Barrett, R. Datta

Cr(VI) removal by membrane-based zerovalent metallic nanoparticles in wastewater. L. Chang, S. Lee, K. Yu, S. Chen

Determination of COD using SWCNT/TiO$_2$/GCE electrodes. C.J. Chin, Y. Lu

Flow of lipid vesicles and nanoparticles through microfluidic channels. P. Garlapati, E.S. Sani, Y. Tang, M. Kiani, B. Kim, S.L. Wunder
Nanotechnology for Sustainable Agriculture & Food Systems

Cosponsored by AGRO and CEI
P. Demokritou, G. Lowry, N. B. Saleh, J. C. White, Organizers

6:00 - 8:00

. Kinetic studies of ceria nanocrystals for catalytic dephosphorylation. M. Manto, C. Wang

Next Generation Techniques for Prevention & Precise Growth of Biofilms at the Interface of Nanomaterials & Electrochemistry

S. Aggarwal, A. Badireddy, V. Gadhamshetty, Organizers

6:00 - 8:00

. Influence of supporting materials on biofilm formation and subsequent cyanotoxin degradation. Y. Jeon, Y. Seo

. Reduction of viable microorganisms and biofilm formation via modification of surfaces with a novel antimicrobial system. V. Singh, D. Jofat, G. O'Mullan, W. Blanford, R. Engel

Occurrence, Behavior & Remediation of Mixed Organic Pollution in Soil & Sediment

Cosponsored by AGRO
X. Li, J. J. Pignatello, B. Xing, L. Zhu, Organizers

6:00 - 8:00

. Levels and distributions of organophosphorus pesticides in agricultural soils from the Yangtze River Delta of China. J. Sun, L. Pan, X. Li, L. Zhu

. Contamination and risk assessment of DDTs in agricultural soils from the Yangtze River Delta of China. J. Sun, L. Pan, X. Li, L. Zhu

. Atrazine contamination in agricultural soils from the Yangtze River Delta of China and associated health risks. J. Sun, D. Tsang, L. Pan, L. Zhu, X. Li


. Occurrence and distribution of pharmaceutical compounds in the vadose zone of a wastewater irrigated field in Northern China. L. Ma, G. Li

. Photochemistry of dissolved black carbon released from biochar. H. Fu, X. Qu, D. Zhu
Selective sorption removal of phenanthrene by resins from anionic and nonionic surfactant solutions. **K. Yang, Y. Zeng, C. Zhou**

**Poly- & Perfluoroalkyl Substances: Environmental Behavior & Pollution Control**

D. Chiang, Q. Huang, L. S. Lee, E. R. McKenzie, D. Woodward, *Organizers*

**6:00 - 8:00**

Thermochemical properties ($\Delta_f H^0(298)$, $S^0(298)$, $Cp(T)$) and bond dissociation energies for fluorinated methanols and fluorinated methyl hydroperoxides: $CH_3_xF_yOH$ and $CH_3_xF_yOOH$. **J.W. Bozzelli, H. Wang**

Helical nature of perfluorochemicals and its implications. **M.A. Pagenkopf, D.J. Van Hoomissen, S. Vyas**

**Recent Advances in Remediation Strategies & Technologies for the Cleanup of Hazardous Waste Sites**

E. R. McKenzie, A. Pham, *Organizers*

**6:00 - 8:00**

Novel method for the reductive dechlorination of 1,2-dichloropropane in aqueous environments. **C.G. Lewis, N. Lapeyrouse, T.E. Shaw, C.A. Clausen, C. Yestrebsky**

Cometabolic degradation of 1,4-dioxane by an ethane-oxidizing culture. **P.G. Koster Van Groos, P. Hatzinger, S. Streger, R. Rezes, C. Condee, C. Schaefer**

Remediation of 1,2-dichloropropane in aqueous environments by reductive dehalogenation. **N. Lapeyrouse, C.G. Lewis, T.E. Shaw, C.A. Clausen, C. Yestrebsky**

Rates of reduction for competing $^{99}$Tc and Cr removal by Fe(OH)$_2$ in Hanford waste streams. **W. Um, S. Saslow, D. Kim, M.J. Schweiger, A.A. Kruger**

Sono-electro-Fenton degradation of 4-chlorophenol in aqueous media. **R. Nazari, L. Rajić, A. Alshawabkeh**

Groundwater remediation by pump and treat at an organic contaminated site in Beijing. **Z. Qu, H. Wang, Z. Sang**

Oxidation of microcystin-LR by Fe(II)-tetrapolyphosphate in the presence of oxygen: Effect of calcium and magnesium ion. **M. Kim, H. Kim, C. Lee**
Water Purification Systems

Cosponsored by CEI
S. Ahuja, Organizer

6:00 - 8:00

. Preferential degradation of Nonyl Phenol on modified TiO₂ nanotubes. **Z. Fan**

. Tailoring surface imprinted polymeric particles for removing organic and inorganic toxins from aqueous bodies. **A. Mujahid**, S. Farheen, T. Hussain, H. Raza

Geochemistry of the Subsurface: CO₂ Sequestration, Unconventional Oil & Gas Extraction, Geothermal Reservoirs & Radioactive Waste Disposal. Sponsored by GEOC, Cosponsored by ENVR

THURSDAY MORNING

Nanomaterials in the Environment & Biological Systems

Physicochemical & Biological Processes Affecting Their Transformation & Transport

S. Joo, W. H. Lee, Organizers
P. Yi, Organizer, Presiding


8:25 . Adsorption of human serum albumin proteins on graphene oxide. **C. Yan**, X. Liu, K. Chen


9:15 . Integrated methodology for assessing the potential toxicity of engineered nanoparticles in embryonic zebrafish. E. Dumitrescu, X. Liu, D. Karunaratne, K. Wallace, **S. Andreescu**

9:40 Intermisison.


10:20 . Exposure of few layer graphene to *Limnodrilus hoffmeisteri* modifies the graphene and changes its bioaccumulation by other organisms. **L. Mao**
10:45. Correlation between nanoparticle attachment to model cell membranes and nanoparticle in vitro toxicity. X. Chang, W. Henderson, S. Martin, D.C. Bouchard


11:35. Effects of CeO2 and ZnO nanoparticles on the uptake of essential elements by corn (Zea mays) and cucumber (Cucumis sativus) plants. N. Zuverza, J. Trujillo-Reyes, J. Hong, L. Zhao, A.C. Barrios, J.R. Peralta-Videa, J.L. Gardea-Torresdey

Section B

Advances in Understanding Antibiotics, Antibiotic Resistance Genes & Antibiotic-Resistant Bacteria in Engineered & Natural Environments

Cosponsored by AGRO
K. Chu, C. Huang, J. McLain, Organizers, Presiding

8:30 Introductory Remarks.

8:35. Metagenomic survey of antibiotic resistance genes in four paired reclaimed and potable water distribution systems. E. Garner, J. McLain, M. Edwards, A. Pruden

8:55. Antibiotic-resistant bacteria and genes in drinking water. R. Destiani, M.R. Templeton


9:35. Fate, transport, and management of antibiotics and antibiotic resistance genes in the agroecosystem. X. Li, S. Bartelt-Hunt, D.D. Snow, J. Gilley


10:15. Changes in antibiotic resistance gene abundance during wastewater treatment processes. B.V. Kjellerup, J. Holt

10:35 Intermission.

10:50. Microbial control with polyvalent phages is significantly enhanced by competitive exclusion by pre-exposed phage-production hosts. P. Yu, J. Mathieu, Y. Yang, P.J. Alvarez


11:30. Estrogen-induced antibiotic resistance. O. Conroy-Ben


12:10 Concluding Remarks.
Crystal Defects on Surface Reactivity & Heterogeneous Photocatalysis

Financially supported by AEESP
D. D. Dionysiou, R. Doong, Organizers
C. Huang, H. L. Ong, Organizers, Presiding

8:00 Introductory Remarks.

8:05 . Point defects in compounds. F. Lu

8:40 . Investigating the surface reactions and mechanisms during the reduction of manganese and iron oxide and oxyhydroxide phases by sulfide. G.W. Luther


9:40 . Oxygen deficient titanium dioxide: A low cost material for water treatment. B.P. Chaplin, Y. Jing, S. Nayak

10:05 Intermission.


11:10 . Fabrication of α-MnO₂ nano-particle and nano-rod composite electrodes for capacitive deionization. Y. Chen, Y. Juang, C. Huang


Occurrence, Behavior & Remediation of Mixed Organic Pollution in Soil & Sediment

Cosponsored by AGRO
X. Li, B. Xing, L. Zhu, Organizers, Presiding

8:00 . Mitigation and remediation of organic contaminated soils. F. Li, C. Wang, J. Sun, L. Pan, L. Zhu

8:30 . Biodegradation of 1,4-dioxane in chlorinated solvent mixtures. S. Zhang, P. Gedalanga, S. Mahendra

8:50 . Black carbon facilitated dechlorination of DDT and its metabolites in the presence of sulfides. K. Ding, W. Xu

9:10 . Enhanced photodegradation of atrazine in the presence of montmorillonite clay and indole-3-acetic acid. C. Gu

9:50  . Adhesion of *Shewanella oneidensis* MR-1 to goethite and its impact on the transformation of enrofloxacin. **W. Yan**, C. Jing

10:10 Intermission.


10:40  . Comparison of thermal and microwave remediation for a Nigerian oil polluted soil and implications of phytoremediation for photosynthetic efficiency. **E.O. Nwaichi**, A. Ogunkeyede, **C.E. Snape**

11:00  . Impacts of polycyclic aromatic hydrocarbons (PAHs) emitted by coking industry base on cabbages from neighboring vegetable plots in Shanxi province, north of China. **G. Xiong**, Y. Zhang, Y. Duan, C. Cai, X. Wang, J. Li, S. Tao, **W. Liu**


**Section E**

**Bioanalytical Tools for Chemicals of Emerging Concern in the Environment**

Cosponsored by AGRO
R. Marfil-Vega, L. A. Weinrich, *Organizers, Presiding*

8:00 Introductory Remarks.

8:05  . Metachromatic interactions of a dye probe and compounds associated with membrane fouling. **X. Xie**, G. Korshin

8:25  . Detection of sartans, related compounds and TPs in real-world aqueous environmental samples using fragment ion search and HRMS. **D. Barcelo**, B. Zonja, M. Lopez de Alda

8:45  . Stable isotope probing for active acidophilic methanotrophs capable of degrading trichloroethylene. **Y. Shao**, P. Hatzinger, S. Streger, **K. Chu**

9:05 Intermission.


9:40  . Dioxin-like potencies and concentrations of AhR-active compounds in sediments of Meiliang Bay, Tai Lake, China determined by *in vitro* bioassay and instrumental analysis. **Y. Xu**

10:20 Intermission.


11:15. Determination of aqueous film forming foams (AFFFs) in the environment using multivariate statistical analysis of liquid chromatography high resolution mass spectrometry (LC/HRMS) data. **D. Stevens, L. Mullin, G. Cleland, A. Karmann**


11:55 Concluding Remarks.

**Environmental Risk Assessment of Down-the-Drain Chemicals.** Sponsored by AGRO, Cosponsored by ENVR

**Experimental Studies of the Molecular Scale Processes at Environmental Interfaces / Adsorption, Water Purification & Biomolecules.** Sponsored by GEOC, Cosponsored by ENVR

**Novel Nanomaterials / Various.** Sponsored by ENFL, Cosponsored by CATL and ENVR

**Subsurface Fate of Pesticides.** Sponsored by AGRO, Cosponsored by ENVR

**Heterogeneous Catalysis for Selective Oxidation & Reduction toward a Green Production / Selective Oxidation & Reduction.** Sponsored by ENFL, Cosponsored by CATL and ENVR

**Innovations in Human Health Exposure & Risk Assessment.** Sponsored by AGRO, Cosponsored by ENVR and TOXI

**Innovative Chemistry & Materials for Electroenergy Production & Storage / Electrocatalysis for Low-Temperature Fuel Cells & CO2 Reduction.** Sponsored by ENFL, Cosponsored by ENVR and MPPG

**2D Materials: Graphene & Beyond & their Device Applications.** Sponsored by ENFL, Cosponsored by ENVR
THURSDAY AFTERNOON

Nanomaterials in the Environment & Biological Systems

Physicochemical & Biological Processes Affecting Their Transformation & Transport

S. Joo, W. H. Lee, P. Yi, Organizers
J. M. Pettibone, N. B. Saleh, Presiding

1:15. Probe the existence of oxidation debris on the surface of graphene oxide nanosheet and its effect on adsorption capability. X. Chen, B. Chen

1:35. Photo-transformation of titanium dioxide- and zinc oxide-multiwalled carbon nanotube heterostructures in aqueous environment. I.V. Sabaraya, D. Das, N.B. Saleh

1:55. Aggregation kinetics of graphene quantum dots in aqueous solutions: Complex pH-dependence of mono-/di-valent electrolytes. Q. Li, B. Chen

2:15. Platinum group element release from nanomaterials in automobile catalytic converter emissions. D. Aruguete, M. Murayama

2:35. Intermission.

2:50. Molecular dynamics simulations of small nanoparticles aggregation (D < 5 nm) in aqueous solution. J. Lu, H. Liu, F. Cui

3:10. Theoretical predictions of stable LiCoO$_2$ (001) surface and phosphate anion adsorption at the oxide-water interfaces. X. Huang, C. Yang, M.N. Hang, R.J. Hamers, S.E. Mason


4:10. Electroanalytical methods in characterization of metal sulphide nanoparticles in water environment. I. Ciglenecki

Section B

Advances in Understanding Antibiotics, Antibiotic Resistance Genes & Antibiotic-Resistant Bacteria in Engineered & Natural Environments

Cosponsored by AGRO
K. Chu, C. Huang, J. McLain, Organizers, Presiding

1:15. Introductory Remarks.


3:00 Intermission.


3:55 . Structure-dependent reduction mechanisms of isoxazoles by aqueous FeII–tiron complex. **Y. Chen**

4:15 . Copper and silver vanquishing of hospital acquired “superbugs”: An economical solution to a major public health problem. **J.R. Ellis**

4:35 Concluding Remarks.

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**Section C**

**Crystal Defects on Surface Reactivity & Heterogeneous Photocatalysis**

Financially supported by AEESP
C. Huang, H. L. Ong, *Organizers*
D. D. Dionysiou, R. Doong, *Organizers, Presiding*

1:15 . Properties evaluation on biocomposites from palm kernel shell and polypropylene. **H.L. Ong**, G. Toh, W. Owi

1:40 . Heterogeneous structure of 1-D mixed phase TiO2 nanorod arrays with enhanced photocatalytic activity. **L. Kao**, L. Ya Hsuan


2:55 Intermission.

3:10  Forward osmosis-membrane distillation (FO-MD) hybrid process by utilizing poly(propylene oxide) as a biodegradable draw agent. S. Chen, S.S. Ray

3:35  Reduced graphene oxide based bimetallic Ni/Fe nanohybrids for rapid dechlorination of trichloroethylene. R.S. Sahu, D. Li, R. Doong

4:00  Recovery of phosphate from industrial wastewater by homogeneous ferrous phosphate crystallization. R. Priambodo, Y. Huang, Y. Shih

4:25  Sulfate radical-mediated degradation of sulfadiazine by CuFeO₂ rhombohedral crystal-catalyzed peroxymonosulfate: Synergistic effects and mechanisms. Y. Feng, K. Shih

4:50  In situ synthesis of g-C₃N₄ based nanocomposites with enhanced UV- and visible-light photocatalytic activities. Y. Hu

Section D

Occurrence, Behavior & Remediation of Mixed Organic Pollution in Soil & Sediment

Cosponsored by AGRO
B. Xing, L. Zhu, Organizers
X. Li, Organizer, Presiding


1:35  Molecular fractionation of dissolved organic matter induced by adsorption on soil minerals and soil inorganic components. J. Lv, S. Zhang, Z. Huang, L. Luo


2:15  Facilitated transport of phenanthrene and oxytetracycline by oxidized-multiwalled carbon nanotubes in soil columns. J. Fang, M. Wang, B. Shen, D. Lin

2:35  Adsorption, mobility, and bioaccessibility of PBDEs: Roles of heavy metals, natural organic matter, and fertilizers. X. Zhu, X. Yang, D. Tsang

2:55 Intermission.

3:05  Polychlorinated biphenyls in agricultural soils from the Yangtze River Delta of China: Contamination characteristics, combined ecological effects, and human health risks. J. Sun, L. Pan, D. Tsang, L. Zhu, X. Li


3:45  Phthalate ester contamination in facility agriculture and cumulative health risk assessment. J. Gao
4:05 Discussion.

Environmental Risk Assessment of Down-the-Drain Chemicals. Sponsored by AGRO, Cosponsored by ENVR

Environmental Study Design: Current & Emerging Guidelines. Sponsored by AGRO, Cosponsored by ENVR

Advances in Agrochemical Metabolism & Metabolomics. Sponsored by AGRO, Cosponsored by ANYL and ENVR