

April 15, 2008

# ENVIRONMENTAL Science & Technology

<http://pubs.acs.org/est>



## **GREENHOUSE GAS** **Mitigation** *and* **Utilization**

Regulating the Geological  
Sequestration of CO<sub>2</sub>

PUBLISHED BY  
THE AMERICAN  
CHEMICAL SOCIETY

## SPECIAL FOCUS: GREENHOUSE GAS MITIGATION AND UTILIZATION

2723

### An Investigation of Synthetic Fuel Production via Chemical Looping

Frank Zeman\* and Marco Castaldi

Fuel synthesis with carbon dioxide using chemical looping for gas conditioning in order to incorporate all carbon molecules in the product is investigated.

■ 2728

### Carbon Dioxide Capture from Atmospheric Air Using Sodium Hydroxide Spray

Joshuah K. Stolaroff, David W. Keith, and Gregory V. Lowry\*

Energy requirements and cost of CO<sub>2</sub> capture from atmospheric air using a spray-based contractor are determined from a prototype system and theory.

2736

### Development of Regenerable MgO-Based Sorbent Promoted with K<sub>2</sub>CO<sub>3</sub> for CO<sub>2</sub> Capture at Low Temperatures

Soo Chool Lee, Ho Jin Chae, Soo Jae Lee, Bo Yun Choi, Chang Keun Yi, Joong Beom Lee, Chong Kul Ryu, and Jae Chang Kim\*

The roles of water and MgO in MgO-based dry sorbents with K<sub>2</sub>CO<sub>3</sub> for CO<sub>2</sub> capture at low temperature are discussed.

■ 2742

### Reservoir Engineering To Accelerate the Dissolution of CO<sub>2</sub> Stored in Aquifers

Yuri Leonenko and David W. Keith\*

Pumping brines within an aquifer can accelerate the dissolution of stored CO<sub>2</sub> providing a low-cost method for reducing the risk of leakage.

■ 2748

### Magnesium Hydroxide Extracted from a Magnesium-Rich Mineral for CO<sub>2</sub> Sequestration in a Gas-Solid System

Pao-Chung Lin, Cheng-Wei Huang, Ching-Ta Hsiao, and Hsisheng Teng\*

Mg(OH)<sub>2</sub> is efficiently extracted from serpentine and absorbs CO<sub>2</sub> gas by forming a monolayer of carbonates on the crystal domain boundary.

■ 2753

### Formation of Carbon Dioxide Hydrate in Soil and Soil Mineral Suspensions with Electrolytes

Rheo B. Lamorena and Woojin Lee\*

The effects of soil and soil mineral surfaces and electrolytes on the formation of CO<sub>2</sub> hydrate are shown.

■ 2760

### Sequestration of Dissolved CO<sub>2</sub> in the Oriskany Formation

Robert M. Dilmore\*, Douglas E. Allen, J. Richard McCarthy Jones, Sheila W. Hedges, and Yee Soong

A revised methodology for estimation of brine formation CO<sub>2</sub> capacity is presented, incorporating an experimentally verified equation of state with relevant geospatial data.

## POLICY ANALYSIS

■ 2767

### Air Quality Impacts from Prescribed Forest Fires under Different Management Practices

Di Tian\*, Yuhang Wang, Michelle Bergin, Yongtao Hu, Yongqiang Liu, and Armistead G. Russell

Potential prescribed burning management practices are examined from an air quality impact point of view during March 2002.

■ 2773

### ISO 14001 as an Environmental Capacity Building Tool — Variations among Nations

Dorit Kerret

Differences in implementing ambiguous requirements of ISO 14001 for information and communication are discussed as findings reported from Japan and the United States are compared with survey results from Israel.

## CHARACTERIZATION OF NATURAL AND AFFECTED ENVIRONMENTS

■ 2780

### Characterization of Methyl Mercury in Dental Wastewater and Correlation with Sulfate-Reducing Bacterial DNA

Xiuhong Zhao, Karl J. Rockne\*, James L. Drummond, Ryan K. Hurley, Christopher W. Shade, and Robert J. M. Hudson

Methyl mercury levels from 2 to 270 nM correlate with DNA from sulfate-reducing bacteria in dental wastewater.

■ 2787

### Origin of Nitrogen in Reforested Lignite-Rich Mine Soils Revealed by Stable Isotope Analysis

Abad Chabbi, Mathieu Sebilo, Cornelia Rumpel\*, Wolfgang Schaaf, and André Mariotti

The quantification of plant and lignite derived nitrogen in mineral soil and soil solution by the use of <sup>15</sup>N isotopes is reported.

■ 2793

### Organic Matter and Modeling Redox Reactions during River Bank Filtration in an Alluvial Aquifer of the Lot River, France

Monika A. M. Kedziorek\*, Stephane Geoffriau, and Alain C. M. Bourg

Dissolved organic matter infiltrated from a river into a well field in an alluvial aquifer is not sufficient to explain the redox-controlled water chemistry.

■ 2799

### Airborne Bacterial Spore Counts by Terbium-enhanced Luminescence Detection: Pitfalls and Real Values

Qingyang Li, Purnendu K. Dasgupta\*, and Henry K. Temkin

Dipicolinic acid-induced luminescence of terbium(III) can be successfully used to measure background spore counts as long as the collected aerosol is first washed to remove chelating organic ligands.

■ 2805

### Fate of Pharmaceutical and Trace Organic Compounds in Three Septic System Plumes, Ontario, Canada

Cherilyn Carrara, Carol J. Ptacek\*, William D. Robertson, David W. Blowes, Michael C. Moncur, Ed Sverko, and Sean Backus

Measurements at septic system tile fields indicate that pharmaceutical compounds may be mobile and more persistent under suboxic to reducing conditions.

■ 2812

### Interannual Variations in PM<sub>2.5</sub> due to Wildfires in the Western United States

Dan Jaffe\*, William Hafner, Duli Chand, Anthony Westerling, and Dominick Spracklen

The impacts of wildfires on regional PM<sub>2.5</sub> concentrations in the Western U.S. are quantified, finding up to 3.1 ug/m<sup>3</sup> in some years.

## ENVIRONMENTAL PROCESSES

### ■ 2819

#### **Copper Dynamics and Impact on Microbial Communities in Soils of Variable Organic Status**

David P. H. Lejon, Jean M. F. Martins, Jean Lévêque, Lorenzo Spadini, Noémie Pascault, David Landry, Marie-Jeanne Milloux, Virginie Nowak, Rémi Chaussod, and Lionel Ranjard\*

This multidisciplinary study highlights the possible link between copper distribution and dynamics in soils varying by their soil organic status and impact on indigenous microbial communities.

### 2826

#### **Funneling of Flow into Grain-to-grain Contacts Drives Colloid–Colloid Aggregation in the Presence of an Energy Barrier**

Meiping Tong, Huilian Ma, and William P. Johnson\*

Granular media filter ripening at low overall surface coverage occurs due to funneling of flow into grain-to-grain contacts, which drives aggregation of colloids in these zones.

### ■ 2833

#### **Solid- and Solution-Phase Organics Dictate Copper Distribution and Speciation in Multicomponent Systems Containing Ferrihydrite, Organic Matter, and Montmorillonite**

Nadia Martínez-Villegas\* and Carmen Enid Martínez\*

Competition among dissolved organic carbon, iron oxides, organic matter, and clays for Cu retention demonstrate iron oxides are poor competitors.

### ■ 2839

#### **Real-Time X-ray Absorption Spectroscopy of Uranium, Iron, and Manganese in Contaminated Sediments During Bioreduction**

Tetsu K. Tokunaga,\* Jiamin Wan, Yongman Kim, Steve R. Sutton, Matthew Newville, Antonio Lanzirotti, and William Rao

Real-time oxidation state measurements of U, Mn, and Fe in sediments during bioreduction support the hypothesis that U(IV) was reoxidized by Fe(III) under reducing conditions.

### 2845

#### **Pathways for the Anaerobic Microbial Debromination of Polybrominated Diphenyl Ethers**

Kristin R. Robrock, Peter Korytár, and Lisa Alvarez-Cohen\*

Debromination pathways for seven environmentally relevant PBDE congeners by three different dehalogenating cultures are discussed.

### ■ 2853

#### **Impact of Natural Organic Matter on the Physicochemical Properties of Aqueous C<sub>60</sub> Nanoparticles**

Bin Xie, Zhihua Xu, Wenhua Guo, and Qilin Li\*

Natural organic matter causes disaggregation of aqueous C<sub>60</sub> fullerene nanoparticles formed by solvent exchange methods.

### ■ 2860

#### **Competitive Binding of Cd and Zn with the Phytochelatin (γ-Glu-Cys)<sub>4</sub>-Gly: Comparative Study by Mass Spectrometry, Voltammetry–Multivariate Curve Resolution, and Isothermal Titration Calorimetry**

Elena Chekmeneva, Rafel Prohens, José Manuel Díaz-Cruz, Cristina Ariño, and Miquel Esteban\*

Cd and Zn competitive complexation by the phytochelatin (γ-Glu-Cys)<sub>4</sub>-Gly is studied by employing mass spectrometry, voltammetry/multivariate curve resolution, and calorimetry.

### 2867

#### **Evidence for the Incorporation of Lead into Barite from Waste Rock Pile Materials**

Alexandra Courtin-Nomade,\* Marilyne Soubrand-Colin, Matthew A. Marcus, and Sirine C. Fakra

Micro-Raman and micro-scanning X-ray diffraction investigations show the incorporation of Pb<sup>2+</sup> into barite rather than into goethite.

### ■ 2873

#### **Aerobic Biotransformation and Fate of *N*-Ethyl Perfluorooctane Sulfonamidoethanol (*N*-EtFOSE) in Activated Sludge**

Kurt R. Rhoads, Elisabeth M.-L. Janssen, Richard G. Luthy, and Craig S. Criddle\*

A fate model using biotransformation rates determined for a perfluorinated surfactant in batch studies predicts most is stripped to the atmosphere during activated sludge treatment.

### ■ 2879

#### **The Rate of 2,2-Dichloropropane Transformation in Mineral Micropores: Implications of Sorptive Preservation for Fate and Transport of Organic Contaminants in the Subsurface**

Hefa Cheng and Martin Reinhard\*

Sorption in mineral micropores inhibits water-mediated transformation and can cause the preservation of anthropogenic organic contaminants in the subsurface under slow-flow conditions.

### 2886

#### **Quantification of Solute–Solute Interactions Using Negligible-Depletion Solid-Phase Microextraction: Measuring the Affinity of Estradiol to Bulk Organic Matter**

Peta A. Neale, Beate I. Escher, and Andrea I. Schäfer\*

The application of solid-phase microextraction to measure the partitioning of estradiol to different types of bulk organic matter at environmental concentrations is explored.

### 2893

#### **Coadsorption of Arsenic(III) and Arsenic(V) onto Hydrous Ferric Oxide: Effects on Abiotic Oxidation of Arsenic(III), Extraction Efficiency, and Model Accuracy**

Je-Hun Jang\* and Brian A. Dempsey

Coadsorption experiments of As(III) and As(V) reveal deficiencies in existing adsorption models and unanticipated effects on extraction and oxidation processes.

### ■ 2899

#### **Influence of Surface Oxides on the Adsorption of Naphthalene onto Multiwalled Carbon Nanotubes**

Hyun-Hee Cho, Billy A. Smith, Joshua D. Wnuk, D. Howard Fairbrother, and William P. Ball\*

The maximum sorption capacity of multiwalled carbon nanotubes toward naphthalene decreases linearly with increasing surface oxygen concentration, without affecting sorption heterogeneity.

### 2906

#### **Degradation of Cellulose under Alkaline Conditions: New Insights from a 12 Years Degradation Study**

Martin A. Glaus\* and Luc R. Van Loon

The uncertainty in the time needed for complete degradation of cellulose in an alkaline cementitious environment is significantly reduced by new experimental data.

■ 2912

**Cu and Zn Concentration Gradients Created by Dilution of pH Neutral Metal-Spiked Marine Sediment: A Comparison of Sediment Geochemistry with Direct Methods of Metal Addition**

Colin M. Hutchins,\* Peter R. Teasdale, Shing Yip Lee, and Stuart L. Simpson

Dilution of Cu- and Zn-spiked, pH-adjusted sediment produces concentration gradients with sediment partitioning (Cu, Zn, Fe, Mn), pH, and Eh typical of metal-contaminated natural marine sediments.

■ 2919

**Reduction of Lead Oxide (PbO<sub>2</sub>) by Iodide and Formation of Iodoform in the PbO<sub>2</sub>/I<sup>-</sup>/NOM System**

Yi-Pin Lin,\* Michael P. Washburn, and Richard L. Valentine\*

A novel disinfection byproduct formation pathway is shown to involve the oxidation of iodide by lead oxide which leads to the formation of iodoform in the presence of natural organic matter.

## ENVIRONMENTAL MODELING

■ 2925

**Ranking of Refrigerants**

Guillermo Restrepo, Monika Weckert, Rainer Brüggemann, Silke Gerstmann, and Hartmut Frank\*

The major alternative refrigerants are ranked based upon ozone depletion potential, global warming potential, and atmospheric lifetime using the partial-order approach of the Hasse diagram technique.

■ 2931

**Efficient Adsorption of Super Greenhouse Gas (Tetrafluoromethane) in Carbon Nanotubes**

Piotr Kowalczyk\* and Robert Holyst

Light membranes composed of single-walled carbon nanotubes (SWNTs) can serve as efficient nanoscale vessels for encapsulation of tetrafluoromethane at 300 K and operating external pressure of 1 bar.

2937

**Emission Factor for Antimony in Brake Abrasion Dusts as One of the Major Atmospheric Antimony Sources**

Akihiro Iijima,\* Keiichi Sato, Kiyoko Yano, Masahiko Kato, Kunihisa Kozawa, and Naoki Furuta

Emission factors from automotive brake pads are estimated to be 3.9 mg dusts/braking/car and 22 µg Sb/braking/car for fine airborne particulate matter (PM<sub>2.5</sub>).

■ 2943

**The Role of the Snowpack on the Fate of α-HCH in an Atmospheric Chemistry-Transport Model**

Kaj M. Hansen,\* Crispin J. Halsall, Jesper H. Christensen, Jørgen Brandt, Lise M. Frohn, Camilla Geels, and Carsten Ambelas Skjøth

Prediction of spring maximum events and improved correlation between modeled and observed α-HCH air concentrations obtained by inclusion of a snowpack module in the DEHM-POP model.

## ENVIRONMENTAL MEASUREMENTS METHODS

■ 2949

**X-ray Microtomography Determination of Air–Water Interfacial Area–Water Saturation Relationships in Sandy Porous Media**

Molly S. Costanza-Robinson,\* Katherine H. Harrold, and Ross M. Lieb-Lappen

Interfacial area–water saturation relationships are measured for nine sandy porous media using synchrotron X-ray microtomography and used to develop an empirical interfacial area model.

■ 2957

**Levoglucosan and Other Cellulose Markers in Pyrolysates of Miocene Lignites: Geochemical and Environmental Implications**

Daniele Fabbri, Leszek Marynowski,\* Monika J. Fabiańska, Michał Zatoń, and Bernd R.T. Simoneit

Levoglucosan and other anhydroglucoses produced by pyrolysis of some fossil lignites utilized as fuels in Poland are evaluated.

2964

**Evaluation of Two Current Approaches for the Measurement of Carbon Dioxide Diffusive Fluxes from Lentic Ecosystems**

Nicolas Soumis,\* René Canuel, and Marc Lucotte

A boundary layer equation and a custom static chamber are evaluated to define their accuracy and the factors responsible for biases.

■ 2970

**Field Testing a Flow-Through Sampler for Semivolatile Organic Compounds in Air**

Hang Xiao, Hayley Hung, Tom Harner, Ying D. Lei, and Frank Wania\*

A wind-driven air sampler suffers no break-through and yields reliable time-integrated concentrations of PCBs and PAHs over two week sampling periods.

2976

**Measurement of Drinking Water Contaminants by Solid Phase Microextraction Initially Quantified in Source Water Samples by the USGS**

Robert Stiles, III Yang, Robert Lee Lippincott, Eileen Murphy, and Brian Buckley\*

This paper describes the creation and application of a solid phase microextraction (SPME)-GC/MS method for analysis of compounds targeted in a previous USGS study.

2982

**Identification of Tylosin Photoreaction Products and Comparison of ELISA and HPLC Methods for Their Detection in Water**

Dingfei Hu, Bruce Fulton, Keri Henderson, and Joel Coats\*

Structures were determined for two photoproducts of the veterinary antibiotic tylosin, and the ELISA cross-reactivity is reported for those products and three other tylosin factors.

■ 2988

**Detection of Trace Triclocarban in Water Sample Using Solid-Phase Extraction–Liquid Chromatography with Stochastic Resonance Algorithm**

Shaofei Xie, Haishan Deng, Bingren Xiang,\* and Suyun Xiang

The algorithm is applied to the trace detection with a new index proposed to enhance both the signal-to-noise ratio and the peak shape.

## REMEDICATION AND CONTROL TECHNOLOGIES

■ 2992

**Secondary Effects of Catalytic Diesel Particulate Filters: Reduced Aryl Hydrocarbon Receptor-Mediated Activity of the Exhaust**

Daniela Wenger, Andreas C. Gerecke,\* Norbert V. Heeb, Markus Zennegg, Martin Kohler, Hanspeter Naegeli, and Renato Zenobi

A reporter gene assay is used to detect aryl hydrocarbon receptor agonists in diesel exhaust and to investigate effects of exhaust treatment by catalytic diesel particulate filters on agonist emissions.

2999

#### **Sustained Removal of Uranium From Contaminated Groundwater Following Stimulation of Dissimilatory Metal Reduction**

A. Lucie N'Guessan,\* Helen A. Vronis, Charles T. Resch, Philip E. Long, and Derek R. Lovley

An unexpected phenomenon where long-term removal of uranium from groundwater is observed postbiostimulation is described, and a potential mechanism is suggested.

■ 3005

#### **Ferrate(VI) Oxidation of Weak-Acid Dissociable Cyanides**

Ria A. Yngard, Virender K. Sharma,\* Jan Filip, and Radek Zboril

The destruction of  $\text{Cd}(\text{CN})_4^{2-}$  and  $\text{Ni}(\text{CN})_4^{2-}$  in water and total cyanide in industrial effluent by ferrate(VI) in alkaline medium to relatively nontoxic products is presented.

■ 3011

#### **Electrolytic Methanogenic–Methanotrophic Coupling for Tetrachloroethylene Bioremediation: Proof of Concept**

Serge R. Guiot,\* Ruxandra Cimpoaia, Ramona Kuhn, and Aude Alaplantive

Coupling of methanogenic and methanotrophic catabolisms can be stimulated by water electrolysis and is feasible in a single-stage technology for complete degradation of tetrachloroethylene.

■ 3018

#### **Photocatalytic Removal of Pesticide Dichlorvos from Indoor Air: A Study of Reaction Parameters, Intermediates and Mineralization**

Mohamad Sleiman,\* Corinne Ferronato, and Jean-Marc Chovelon

Air treatment by photocatalysis and application to the removal of pesticides are studied.

■ 3025

#### **Stimulation Of Microbial Urea Hydrolysis In Groundwater To Enhance Calcite Precipitation**

Yoshiko Fujita,\* Joanna L. Taylor, Tina L. T. Gresham, Mark E. Delwiche, Frederick S. Colwell, Travis L. McLing, Lynn M. Petzke, and Robert W. Smith

Microbial urea hydrolysis and calcite precipitation *in situ* can be enhanced with nutrient addition, offering a potential new approach for groundwater contaminant remediation.

■ 3033

#### **Removal of Ammonia from Air on Molybdenum and Tungsten Oxide Modified Activated Carbons**

Camille Petit and Teresa J. Bandosz\*

Molybdenum and tungsten oxides distributed on the surface of activated carbon provide Lewis and/or Brønsted centers for interactions with ammonia molecule or ammonium ions.

■ 3040

#### **Palladium–Indium Catalyzed Reduction of *N*-Nitrosodimethylamine: Indium as a Promoter Metal**

Matthew G. Davie, Kaimin Shih, Federico A. Pacheco, James O. Leckie, and Martin Reinhard\*

Kinetic studies of NDMA reduction using bimetallic Pd–In catalysts and hydrogen gas provide mechanistic insight to develop the technology for drinking and groundwater treatment.

## **SUSTAINABILITY ENGINEERING AND GREEN CHEMISTRY**

■ 3047

#### **Combating Adverse Selection in Secondary PC Markets**

Stewart W. Hickey\* and Colin Fitzpatrick

The existence of adverse selection in Ireland's secondary personal computer market is demonstrated, and a solution for implementation of an economic theory to the remarketing of second-hand PC systems is detailed.

■ 3053

#### **Microbial Fuel Cells Generating Electricity from Rhizodeposits of Rice Plants**

Liesje De Schampelaire, Leen Van den Bossche, Hai Son Dang, Monica Höfte, Nico Boon, Korneel Rabaey, and Willy Verstraete\*

Light increases the electrical output of sediment microbial fuel cells through the presence of plants and their release of rhizodeposits.

3059

#### **Simultaneous Hydrogen Production and Electrochemical Oxidation of Organics Using Boron-Doped Diamond Electrodes**

Juyuan Jiang,\* Ming Chang, and Peng Pan

A boron-doped diamond electrode is used in electrochemical degradation of wastewater for organics oxidation and hydrogen production in a single unit.

■ 3064

#### **Efficient Catalytic Decomposition of CO<sub>2</sub> to CO and O<sub>2</sub> over Pd/Mixed-Conducting Oxide Catalyst in an Oxygen-Permeable Membrane Reactor**

Wanqin Jin,\* Chun Zhang, Xianfeng Chang, Yiqun Fan, Weihong Xing, and Nanping Xu

An innovative catalytic process is proposed to decompose CO<sub>2</sub> in an oxygen-permeable membrane reactor packed with a mixed-conducting oxide supported noble metal catalyst.

■ 3069

#### **A Hybrid Life Cycle Inventory of Nano-Scale Semiconductor Manufacturing**

Nikhil Krishnan,\* Sarah Boyd, Ajay Somani, Sebastien Raoux, Daniel Clark, and David Dornfeld

A comprehensive data set and methodology for estimating and reducing resource consumption and emissions of a broad range of technologies involving nano- and microfabrication is presented.

## **ECOTOXICOLOGY AND HUMAN ENVIRONMENTAL HEALTH**

3076

#### **Comparison of Species Sensitivity Distributions Derived from Interspecies Correlation Models to Distributions used to Derive Water Quality Criteria**

Scott D. Dyer,\* Donald J. Versteeg, Scott E. Belanger, Joel G. Chaney, Sandy Raimondo, and Mace G. Barron

Interspecies correlation estimation models are recommended for generating species sensitivity distributions and hazard concentrations for chemicals with limited toxicity data.

■ 3084

#### **Life Cycle Assessment of Japanese High-Temperature Conductive Adhesives**

Anders S. G. Andrae,\* Norihiro Itsubo, Hiroshi Yamaguchi, and Atsushi Inaba

Life cycle assessment is used to estimate the potential environmental impacts of two high-temperature electrically conductive adhesives compared to a high-melting point lead-based solder paste.

### 3090

#### **Bioaccumulation of Radio-Labeled Carbon Nanotubes by *Eisenia foetida***

Elijah J. Petersen, Qingguo Huang, and Walter J. Weber, Jr.\*

CNT bioaccumulation factors nearly two orders of magnitude lower than those for pyrene are investigated.

### 3096

#### **Perfluorinated Compounds in Human Milk from Massachusetts, U.S.A.**

Lin Tao, Kurunthachalam Kannan,\* Chung M. Wong, Kathleen F. Arcaro, and John L. Butenhoff

Perfluorinated acids have been measured in human milk from Massachusetts, U.S.A.

### 3102

#### **Evidence for Bioavailable Copper—Dissolved Organic Matter Complexes and Transiently Increased Copper Bioavailability in Manure-Amended Soils as Determined by Bioluminescent Bacterial Biosensors**

Kristian K. Brandt,\* Peter E. Holm, and Ole Nybroe

Biosensor determination indicates increased Cu bioavailability in manure-amended soil.

### 3109

#### **Reproductive Success, Early Life Stage Development, and Survival of Westslope Cutthroat Trout (*Oncorhynchus clarki lewisii*) Exposed to Elevated Selenium in an Area of Active Coal Mining**

Barri-Lynn Rudolph, Lisak Andreller, and Christopher J. Kennedy\*

Reproductive success of cutthroat trout can be affected by exposure to Se; however, the threshold concentration appears to be above 20 ug/g Se in eggs.

## CORRESPONDENCE AND REBUTTAL

### 3115

#### **Comment on "Microbially Derived Inputs to Soil Organic Matter: Are Current Estimates Too Low?"**

Stephen J. Chapman

### 3116

#### **Response to Comment on "Microbially Derived Inputs to Soil Organic Matter: Are Current Estimates Too Low?"**

Andre Simpson\* and Myrna Simpson

## ADDITIONS AND CORRECTIONS

### 3117

#### **Using Biodynamic Models to Reconcile Differences between Laboratory Toxicity Tests and Field Biomonitoring with Aquatic Insects**

David B. Buchwalter,\* Daniel J. Cain, William H. Clements, and Samuel N. Luoma

### 3117

#### **Voltammetric Detection of Cr(VI) with Disposable Screen-Printed Electrode Modified with Gold Nanoparticles**

Guodong Liu, Ying-Ying Lin, Hong Wu, and Yuehe Lin\*

### 3118

#### **Mercury Concentrations in Salmonids from Western U.S. National Parks and Relationships with Age and Macrophage Aggregates**

Adam R. Schwindt,\* John W. Fournie, Dixon H. Landers, Carl B. Schreck, and Michael L. Kent

■ Supporting information is available free at <http://pubs.acs.org/est>.  
▶ This research is highlighted in the News and Features section.