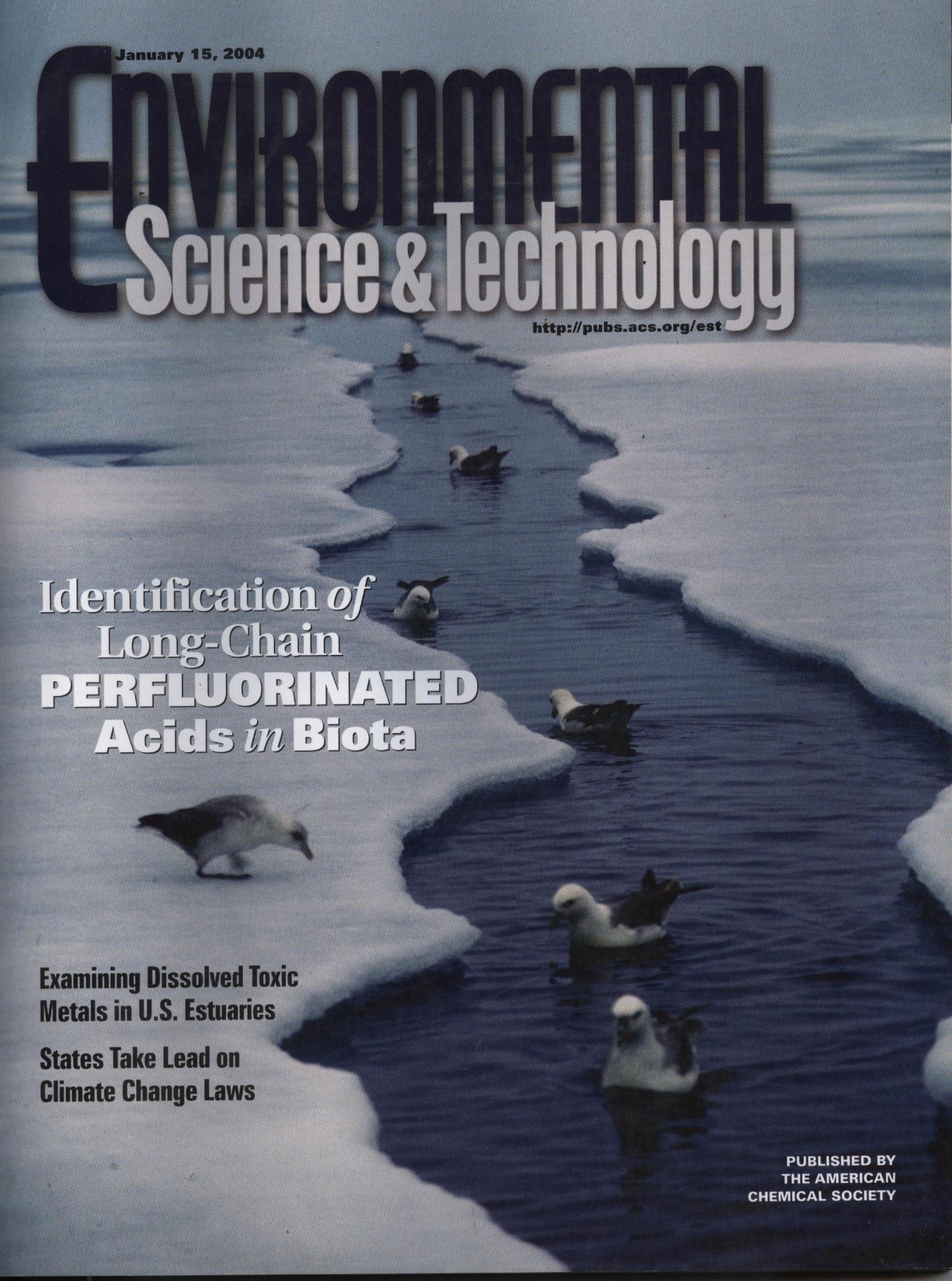


January 15, 2004

# ENVIRONMENTAL Science & Technology

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Identification of  
Long-Chain  
**PERFLUORINATED**  
Acids *in Biota*

Examining Dissolved Toxic  
Metals in U.S. Estuaries

States Take Lead on  
Climate Change Laws

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THE AMERICAN  
CHEMICAL SOCIETY

## Policy Analysis

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### Environmental Assessment of Used Oil Management Methods

Bob Boughton and Arpad Horvath

Rerefining and distilling used oil are environmentally preferable to the combustion of unprocessed used oil as fuel.

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### Will Lake Michigan Lake Trout Meet the Great Lakes Strategy 2002 PCB Reduction Goal?

Craig A. Stow, E. Conrad Lamon, Song S. Qian, and Candy S. Schrank

Bayesian model averaging and dynamic linear models are used to predict the probability of a 25% reduction in PCBs from 2002 to 2007 in Lake Michigan trout.

## Characterization of Natural and Affected Environments

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### Changes in the Regional Emissions of Greenhouse Gases and Ozone-Depleting Compounds

M. Aslam K. Khalil and Reinhold A. Rasmussen

GLOBE project measurements taken between January 1996 and January 1998 indicate that ozone-depleting compounds are decreasing from some regions, but greenhouse gases are not.

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### Synthetic Musk Fragrances in Lake Michigan

Aaron M. Peck and Keri C. Hornbuckle

Concentrations of synthetic musk fragrances in Lake Michigan are measured and predicted as a function of wastewater effluent discharge and atmospheric exchange.

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### Identification of Long-Chain Perfluorinated Acids in Biota from the Canadian Arctic

Jonathan W. Martin, Maria M. Smithwick, Birgit M. Braune, Paul F. Hoekstra, Derek C. G. Muir, and Scott A. Mabury

Detection, confirmation, and quantification of long-chain ( $C_{10}$ - $C_{15}$ ) perfluorinated carboxylic acids in Arctic wildlife are performed using liquid chromatography tandem mass spectrometry.

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### Characterization of Airborne and Bulk Particulate from Iron and Steel Manufacturing Facilities

Steven D. Machermer

Graphite flakes and graphite flakes with spherical iron oxide particles are unique characteristics for identifying particle emissions from iron and steel manufacturing.

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### Occurrence of Methyl Triclosan, a Transformation Product of the Bactericide Triclosan, in Fish from Various Lakes in Switzerland

Marianne E. Balmer, Thomas Poiger, Christian Droz, Kathrin Romanin, Per-Anders Bergqvist, Markus D. Müller, and Hans-Rudolf Buser

Methyl triclosan was found to be a suitable chemical marker for lipophilic wastewater-derived contaminants in fish, and its bioconcentration factor was estimated.

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### Recent Changes in Platinum Group Element Concentrations and Osmium Isotopic Composition in Sediments from an Urban Lake

Sebastien Rauch, Harold F. Hemond, and Bernhard Peucker-Ehrenbrink

Chronological records of platinum group element concentrations in sediments from an urban lake demonstrate environmental contamination by automobile catalyts.

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### PCDDs, PCDFs, and Coplanar PCBs in Albatross from the North Pacific and Southern Oceans: Levels, Patterns, and Toxicological Implications

Shinsuke Tanabe, Mafumi Watanabe, Tu Binh Minh, Tatsuya Kunisue, Shigeyuki Nakanishi, Hitoshi Ono, and Hiroyuki Tanaka

Differences in levels and accumulation patterns of PCDD/Fs and dioxin-like PCBs in albatross from the North Pacific and Southern Oceans are extensively investigated.

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### Causes of Variability in Pesticide and PCB Concentrations in Air near the Great Lakes

Stephanie S. Buehler, Ilora Basu, and Ronald A. Hites

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### Comparison of Personal, Indoor, and Outdoor Exposures to Hazardous Air Pollutants in Three Urban Communities

Ken Sexton, John L. Adgate, Gurumurthy Ramachandran, Gregory C. Pratt, Steven J. Mongin, Thomas H. Stock, and Maria T. Morandi

Researchers report data on concurrent measurements of outdoor, indoor, and personal exposures to 15 individual VOCs over three seasons in three urban neighborhoods.

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### Hydrocarbons in Lake Washington Sediments. A 25-Year Retrospective in an Urban Lake

Stuart G. Wakeham, James Forrest, Caroline A. Masiello, Yves Gélinas, Clark R. Alexander, and Peter R. Leavitt

Recently deposited sediments show dramatic declines in AHCS and PAHs while carbon isotope data point to a shift in pollutant sources from fossil fuel toward erosion.

## Environmental Processes

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### Slow Desorption Mechanisms of Volatile Organic Chemical Mixtures in Soil and Sediment Micropores

Jun Li and Charles J. Werth

Natural and model solid results show many similarities and indicate the importance of hydrophobic micropores in the slow desorption process associated with natural solids.

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### Understanding the Differences in Cd and Zn Bioaccumulation and Subcellular Storage among Different Populations of Marine Clams

Dalin Shi and Wen-Xiong Wang

There is a close relationship between the cadmium dietary assimilation, Cd tissue concentration, and Cd fraction associated with the metallothionein-like protein in marine clams from contaminated and clean sites.

■ Supporting Information is available free of charge via the Internet at <http://pubs.acs.org>.

► This issue contains a news story about this research.

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### Can Degradation Products Be Used as Documentation for Natural Attenuation of Phenoxy Acids in Groundwater?

Lotte A. Reitzel, Nina Tuxen, Anna Ledin, and Poul L. Bjerg

Phenoxy acid metabolites are impurities in herbicides; however, impurity/parent herbicide ratios can be useful indicators of in situ degradation.

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### In Situ Bioreduction of Technetium and Uranium in a Nitrate-Contaminated Aquifer

J. D. Istok, J. M. Senko, L. R. Krumholz, D. Watson, M. A. Bogle, A. Peacock, Y.-J. Chang, and D. C. White

The ability to stimulate indigenous microbial communities to reduce U(VI) and Tc(VII) in a nitrate-contaminated aquifer is demonstrated by in situ testing.

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### Modeling Tetracycline Antibiotic Sorption to Clays

Raquel A. Figueroa, Allison Leonard, and Allison A. MacKay

Tetracycline antibiotics sorb to clays by cation exchange and zwitterionic surface complexation mechanisms with little effect of substituents within this compound class.

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### Factors Affecting the Distribution of the Rate of Carbon Uptake by Forests in South Korea

Sung-Deuk Choi and Yoon-Seok Chang

Forest age class is the most important factor affecting carbon uptake by forests in Korea.

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### Characterization of Sorption Mechanisms of VOCs with Organobentonites Using a LSER Approach

Senlin Tian, Lizhong Zhu, and Yao Shi

The LSER approach coupled with IGC is used to characterize the sorption mechanisms of VOCs with organobentonites.

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### Metal Ion Sorption and Desorption on Zeolitized Tuffs from the Nevada Test Site

Wooyong Um and Charalambos Papelis

This paper discusses the mobility of two metal ions (Sr, Pb), based on their different sorption and desorption behavior, as a function of geochemical conditions.

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### Structure Effect on the Interaction of Phenylurea Herbicides with Model Biomembrane as an Environmental Mobility Parameter

Vito Librando, Stefano Forte, and Maria G. Sarpietro

The differential scanning calorimetry technique reveals that the interaction between model membranes and phenylurea derivative herbicides is correlated with their structure and physicochemical properties. This correlation demonstrates their ability to be absorbed by biomembranes.

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### Photoinduced Oxidation of Hg<sup>0</sup>(aq) in the Waters from the St. Lawrence Estuary

Janick D. Lalonde, Marc Amyot, Jord Orvoine, François M. M. Morel, Jean-Christian Auclair, and Parisa A. Ariya

Elemental mercury photooxidation in saline waters is mainly driven by UV-A radiation and involves intermediate photoproduct oxidant(s), possibly including OH radicals.

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### Emission, Fate, and Effects of Soluble Silicates (Waterglass) in the Aquatic Environment

Hengo P. van Dokkum, Jan H. J. Hulskotte, Kees J. M. Kramer, and Joël Wilmot

Anthropogenic emissions of silica to the aquatic environment caused by the use of the HPVC waterglass are estimated and compared to natural fluxes, and the ecological impacts are assessed.

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### Phenylpyrazole Insecticide Fipronil Induces Male Infertility in the Estuarine Meiobenthic Crustacean *Amphiascus tenuiremis*

Tawnya L. Cary, G. Thomas Chandler, David C. Volz, Spencer S. Walse, and John L. Ferry

The phenylpyrazole insecticide fipronil has negative male-specific impacts on meiobenthic copepod reproduction.

## Environmental Modeling

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### Correlation Equation for Predicting Single-Collector Efficiency in Physicochemical Filtration in Saturated Porous Media

Nathalie Tufenkji and Menachem Elimelech

A new correlation equation for physicochemical colloid filtration in saturated porous media enables accurate predictions of the single-collector contact efficiency.

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### Accumulation and Toxicity of Cadmium in the Aquatic Oligochaete *Tubifex tubifex*: A Kinetic Modeling Approach

Erik Steen Redeker and Ronny Blust

Accumulation and toxicity of cadmium in *Tubifex tubifex* are discussed.

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### Multilinear Model for Spatial Pattern Analysis of the Measurement of Haze and Visual Effects Project

Wanna Chueinta, Philip K. Hopke, and Pentti Paatero

Researchers analyze a three-way data array with a four-product-term model that includes wind patterns.

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### Global Source Attribution for Mercury Deposition in the United States

Christian Seigneur, Krish Vijayaraghavan, Kristen Lohman, Prakash Karamchandani, and Courtney Scott

A global source attribution for the atmospheric deposition of mercury in the United States is performed using a multiscale modeling system.

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### Geographic Sensitivity of Fine Particle Mass to Emissions of SO<sub>2</sub> and NO<sub>x</sub>

Stephen F. Mueller, Elizabeth M. Bailey, and Jimmie J. Kelsoe

An atmospheric chemistry model simulates, for the year 2010, fine particle sensitivities to SO<sub>2</sub> and NO<sub>x</sub> emissions in selected regions of the eastern United States.

## Environmental Measurements Methods

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### Validated Measurements of the Uranium Isotopic Signature in Human Urine Samples Using Magnetic Sector-Field Inductively Coupled Plasma Mass Spectrometry

Ivan Trešl, Günther De Wannemacker, Christophe R. Quérel, Ivan Petrov, Frank Vanhaecke, Luc Moens, and Philip D. P. Taylor

An analytical procedure is developed and validated for the determination of the n(<sup>235</sup>U)/n(<sup>238</sup>U) ratio in human urine samples containing ultralow levels of uranium.

587

### **In Situ Measurements of Cu in an Estuarine Environment Using a Portable Spectrophotometric Analysis System**

Michael R. Callahan, Eric A. Kaltenbacher, and Robert H. Byrne

The technological advances of a newly developed portable in situ spectrophotometric device are highlighted through in situ observations of copper, an important marine pollutant.

## **Remediation and Control Technologies**

594

### **Investigation of the Wetting Behavior of Coal Tar in Three-Phase Systems and Its Modification by Poloxamine Block Copolymeric Surfactants**

Jingfeng Dong, Babur Chowdhry, and Stephen Leharne

At surfactant concentrations below the critical micelle concentration, the work of adhesion can be reduced sufficiently to ensure removal of coal tar from quartz and sand.

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### **Identification of Dynamic Leaching Kinetics of Stabilized, Water-Soluble Wastes**

Tingzong Guo, Pradyot S. Deshpande, and Kelly A. Rusch

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### **Hydrogen and Carbon Isotope Fractionation during Anaerobic Biodegradation of Aromatic Hydrocarbons—A Field Study**

Alfred Steinbach, Richard Seifert, Eva Annweiler, and Walter Michaelis

Carbon and hydrogen stable isotope signatures are a suitable tool to monitor the transformation of selected aromatic hydrocarbons, even in a complex contaminated aquifer.

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### **Combined Application of Stable Carbon Isotope Analysis and Specific Metabolite Determination for Assessing In Situ Degradation of Aromatic Hydrocarbons in a Tar Oil-Contaminated Aquifer**

Christian Griebler, Michael Safinowski, Andrea Vieth, Hans H. Richnow, and Rainer U. Meckenstock

The combination of the analysis of stable carbon isotope fractionation and signature metabolites provides conclusive evidence of in situ bioremediation of aromatic hydrocarbons.

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### **Combined Bioaugmentation and Biostimulation to Clean Up Soil Contaminated with High Concentrations of Atrazine**

Elisabete Silva, Arsênio M. Fialho, Isabel Sá-Correia, Richard G. Burns, and Liz J. Shaw

Mineralization of high concentrations of atrazine by *Pseudomonas* sp. ADP in soil is carbon limited and can be optimized by biostimulation with organic acids.

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### **Electrochemical Hydrodehalogenation of 2,4-Dibromophenol in Paraffin Oil Using a Solid Polymer Electrolyte Reactor**

H. Cheng, K. Scott, and P. A. Christensen

2,4-Dibromophenol is electrochemically hydrodehalogenated in paraffin oil using a solid polymer electrolyte reactor with palladized cathodes.

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### **Mobilizing Particles in a Saturated Zone during Air Sparging**

Yih-Jin Tsai and Da-Feng Lin

By measuring soil resistivity before and after air injection, researchers demonstrate that the soil particles mobilize during air sparging.

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### **Methylmercury Formation in a Wetland Mesocosm Amended with Sulfate**

S. M. Harmon, J. K. King, J. B. Gladden, G. T. Chandler, and L. A. Newnan

The effect of sulfate amendment to a constructed wetland is evaluated with respect to mercury methylation.

■ Supporting Information is available free of charge via the Internet at <http://pubs.acs.org>.