

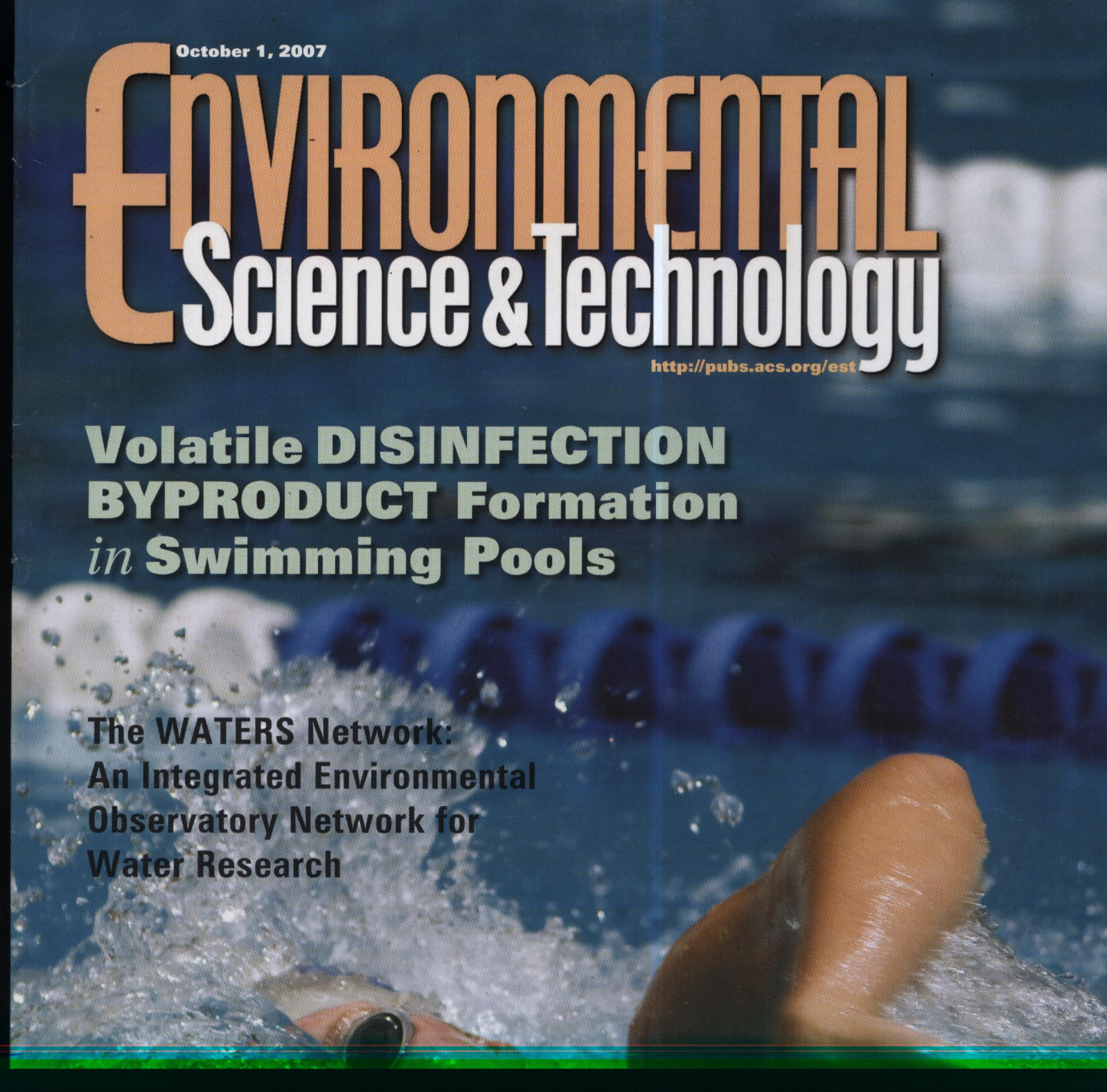
October 1, 2007

ENVIRONMENTAL Science & Technology

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

Volatile DISINFECTION BYPRODUCT Formation *in Swimming Pools*

**The WATERS Network:
An Integrated Environmental
Observatory Network for
Water Research**



News and Features

6633 Comment

Ethanol and water use

NEWS

6634 Swimming in chlorine byproducts

Volatile disinfection byproducts from organic nitrogen precursors add to the list of chemicals found in chlorinated swimming pools.

6635 High corn demand could harm U.S. waters

Scientists predict the biggest dead zone ever in the Gulf of Mexico and more problems for the Chesapeake Bay.

6635-6637 News Briefs

Children face health threats from chemicals • Seafood consumer guide • Removing organic contaminants in water • The future looks bleak for U.S. coastal waters

6636 The carbon footprint of transportation fuels

California researchers lay out a method for judging the cumulative energy and emission impacts of different fuels from production to their use in vehicles.

6637 Lead pipe replacement should go all the way

When it comes to reducing lead in tap water, partially replacing the lead service line may not be enough.

6639 Technology Solutions

Plastics from the bread basket

FEATURE

6642 The WATERS Network: An Integrated Environmental Observatory Network for Water Research

Jami L. Montgomery, et al.



Knowledge of the physical, chemical, and biological mechanisms controlling water quantity and quality is limited by lack of observations at the necessary spatial density and temporal frequency. To address this

Research

POLICY ANALYSIS

■ 6649

Material Availability and the Supply Chain: Risks, Effects, and Responses

Elisa Alonso, Jeremy Gregory, Frank Field, and Randolph Kirchain

An understanding of the business implications of the availability of raw materials can drive firms toward more sustainable material use.

■ 6657

State-Level Infrastructure and Economic Effects of Switchgrass Cofiring with Coal in Existing Power Plants for Carbon Mitigation

William R. Morrow, W. Michael Griffin, and H. Scott Matthews

A technique is presented for estimating the cost of switchgrass and coal cofiring in existing coal-fired power plants in Pennsylvania and Iowa; unique features for each state are highlighted.

CHARACTERIZATION OF NATURAL AND AFFECTED ENVIRONMENTS

■ 6663

Evidence of Debromination of Decabromodiphenyl Ether (BDE-209) in Biota from a Wastewater Receiving Stream

Mark J. La Guardia, Robert C. Hale, and Ellen Harvey

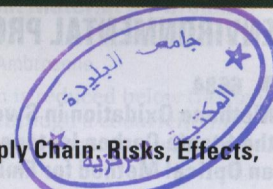
BDE-209 metabolic debromination products, previously detected in laboratory in vivo studies, are identified in wastewater-effluent-associated biota, indicating that BDE-209 debrominates under real-world scenarios.

■ 6671

Trends of Perfluorinated Alkyl Substances in Herring Gull Eggs from Two Coastal Colonies in Northern Norway: 1983-2003

Jonathan Verreault, Urs Berger, and Geir W. Gabrielsen

Concentrations of a broad range of perfluorinated surfactants are leveling off in eggs of herring gulls from northern Norway.



■ 6678

Evidence for the Existence of Organosulfates from β -Pinene Ozonolysis in Ambient Secondary Organic Aerosol

Yoshiteru Iinuma, Conny Müller, Torsten Berndt, Olaf Böge, Magda Claeys, and Hartmut Herrmann

The detection and formation mechanisms of organosulfates from the gas-phase ozonolysis of β -pinene under acidic conditions are discussed for both laboratory-generated and ambient particles.

ENVIRONMENTAL PROCESSES

■ 6684

Methane Oxidation in Swedish Landfills Quantified with the Stable Carbon Isotope Technique in Combination with an Optical Method for Emitted Methane

Gunnar Börjesson, Jerker Samuelsson, and Jeffrey Chanton

Methane oxidation in six landfill sites in Sweden shows that proper closure of landfills is important.

6691

Mercury Methylation by Planktonic and Biofilm Cultures of *Desulfovibrio desulfuricans*

Chu-Ching Lin and Jennifer A. Jay

The mercury methylation rate in SRB biofilms is enhanced relative to that in planktonic cultures, whereas the relative bioavailability of the major mercury species is unchanged.

■ 6698

Predicting Bioavailability and Accumulation of Organochlorine Pesticides by Japanese Medaka in the Presence of Humic Acid and Natural Organic Matter Using Passive Sampling Membranes

Runhui Ke, Jianping Luo, Liwei Sun, Zijian Wang, and Philip A. Spear

The bioavailability and bioaccumulation potential of organochlorine pesticides are predicted in water using passive sampling membranes.

■ 6704

Competitive Uptake of Trichloroethene and 1,1,1-Trichloroethane by *Eucalyptus camaldulensis* Seedlings and Wood

E. R. Graber, A. Sorek, L. Tsechansky, and N. Atzmon

Wood and seedlings show nonlinear and competitive sorption and uptake of trichloroethene and 1,1,1-trichloroethane.

■ 6711

Elucidating Differences in the Sorption Properties of 10 Humic and Fulvic Acids for Polar and Nonpolar Organic Chemicals

Christian Niederer, René P. Schwarzenbach, and Kai-Uwe Goss

Differences in the sorption properties of 10 humic and fulvic acids are evaluated for a set of 80–100 polar and nonpolar organic compounds.

■ 6718

al processes, but BDE-47 is removed by direct photolysis, leading to relatively high levels of Deca BDE in sediments.

■ 6732

▶ Volatile Disinfection Byproduct Formation Resulting from Chlorination of Organic-Nitrogen Precursors in Swimming Pools

Jing Li and Ernest R. Blatchley, III

An analysis of chlorinated swimming-pool water by MIMS indicates the formation of several N-containing volatile organic DBPs that may have adverse human health effects.

■ 6740

Influence of Organic Ligands on the Reduction of Polyhalogenated Alkanes by Iron(II)

Adam L. Bussan and Timothy J. Strathmann

Polyhalogenated alkane contaminants are reduced rapidly in aqueous solution by iron(II) complexes with organic ligands possessing either catechol or thiol Lewis base groups.

ENVIRONMENTAL MODELING

■ 6748

Tracking Petroleum Refinery Emission Events Using Lanthanum and Lanthanides as Elemental Markers for PM_{2.5}

Pranav Kulkarni, Shankaraman Chellam, and Matthew P. Fraser

The contribution of fluidized-bed catalytic cracking emissions to PM_{2.5} during a regional haze episode illustrates how important emission sources can be isolated by quantitative tracking.

ENVIRONMENTAL MEASUREMENTS METHODS

■ 6755

Measurement of Humic and Fulvic Acid Concentrations and Dissolution Properties by a Rapid Batch Procedure

André van Zomeren and Rob N. J. Comans

A rapid method is presented and validated for the quantitative determination of humic, fulvic, and hydrophilic acid concentrations in both aqueous and solid samples.

■ 6762

Assessing the Origin and Fate of Cr, Ni, Cu, Zn, Pb, and V in Industrial Polluted Soil by Combined Microspectroscopic Techniques and Bulk Extraction Methods

Roberto Terzano, Matteo Spagnuolo, Bart Vekemans, Wout De Nolf, Koen Janssens, Gerald Falkenberg, Saverio Fiore, and Pacifico Ruggiero

Major geochemical forms of Cr, Ni, Cu, Zn, Pb, and V in polluted soil are determined by a combination of μ -XRF/ μ -XRD, μ -XANES, and bulk extraction methods.

■ 6770

Monitoring Rice Nitrogen Status Using Hyperspectral Reflectance and Artificial Neural Networks

6783

Enzyme-Linked Immunosorbent Assay Based on a Monoclonal Antibody for the Detection of the Insecticide Triazophos: Assay Optimization and Application to Environmental Samples

Chizhou Liang, Renyao Jin, Wenjun Gui, and Guonian Zhu

The optimization process of an ELISA for triazophos and the immunoassay application to environmental samples are described.

REMEDIATION AND CONTROL TECHNOLOGIES

■ 6789

Mechanism Involved in the Evolution of Physically Irreversible Fouling in Microfiltration and Ultrafiltration Membranes Used for Drinking-Water Treatment

Hiroshi Yamamura, Katsuki Kimura, and Yoshimasa Watanabe

A two-step fouling mechanism in a microfiltration/ultrafiltration membrane used for water treatment is proposed to explain the dominance of carbohydrates in the foulant.

■ 6795

Performance of a Sequential Reactive Barrier for Bioremediation of Coal-Tar-Contaminated Groundwater

Oriol Gibert, Andrew S. Ferguson, Robert M. Kalin, Rory Doherty, Keith W. Dickson, Karen L. McGeough, Jamie Robinson, and Russell Thomas

The design, installation, and monitoring are reported of a sequential reactive barrier (SEREBAR) for groundwater PAH remediation at a manufactured gas plant site.

■ 6802

Photoelectrocatalytic Degradation of Triazine-Containing Azo Dyes at γ -Bi₂MoO₆ Film Electrode under Visible Light Irradiation ($\lambda > 420$ nm)

Xu Zhao, Jiuhui Qu, Huijuan Liu, and Chun Hu

γ -Bi₂MoO₆ film is prepared onto indium-tin oxide (ITO) glass and used as an anode to degrade organic contaminants by electrooxidation, photocatalysis, and a combination of both.

■ 6808

Start-up of Anaerobic Digestion of Source-Sorted Organic Municipal Solid Waste in the Absence of Classical Inocula

Rania Maroun and Mutasem El Fadel

The feasibility of starting up anaerobic digestion of the source-sorted organic fraction of municipal solid waste is investigated by setting up and operating two laboratory-scale anaerobic reactors.

■ 6815

Fate of Octyl- and Nonylphenol Ethoxylates and Some Carboxylated Derivatives in Three American Wastewater Treatment Plants

6828

Role of Lubrication Oil in Particulate Emissions from a Hydrogen-Powered Internal Combustion Engine

Arthur L. Miller, Christopher B. Stipe, Matthew C. Habjan, and Gilbert G. Ahlstrand

Particles emitted from a (nonsmoking) hydrogen-fueled internal combustion engine are analyzed to investigate the role of lubrication in the generation of particulate emissions.

6836

Novel Surfactant-Based Adsorbent Material for Groundwater Remediation

F. Venditti, R. Angelico, A. Ceglie, and L. Ambrosone

2,4,5-trichlorophenol concentration is reduced below the toxicological limit for drinkable water through a cocurrent multistage operation with a novel surfactant-based adsorbent material.

■ 6841

Debromination of Decabrominated Diphenyl Ether by Resin-Bound Iron Nanoparticles

An Li, Chao Tai, Zongshan Zhao, Yawei Wang, Qinghua Zhang, Guibin Jiang, and Jingtian Hu

BDE-209 debromination is rapid and stepwise at ambient temperature, and the calculated net charge of individual atoms is used to explore substitution position preference.

ECOTOXICOLOGY AND HUMAN ENVIRONMENTAL HEALTH

■ 6847

Comparative Health Risks of Domestic Waste Combustion in Urban and Rural Slovakia

Jana Krajčovičová and Alan Q. Eschenroeder

The health risks incurred by open burning of household waste in rural Slovakia are addressed and related to those of controlled municipal waste combustion in Bratislava.

■ 6854

Greatly Enhanced Arsenic Shoot Assimilation in Rice Leads to Elevated Grain Levels Compared to Wheat and Barley

Paul N. Williams, Antia Villada, Claire Deacon, Andrea Raab, Jordi Figuerola, Andrew J. Green, Jörg Feldmann, and Andrew A. Meharg

Despite physiological control of shoot-to-grain export of arsenic in rice, the shoot assimilation is appreciably higher than that in wheat and barley.

■ 6860

Potential for Sea Otter Exposure to Remnants of Buried Oil from the Exxon Valdez Oil Spill

Paul D. Boehm, David S. Page, Jerry M. Neff, and Charles B. Johnson

Surveys indicate that buried oil residues from the Exxon Valdez oil spill are at locations and tide zones where they pose negligible risk to otters.