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ENVIRONMENTAL Science & Technology

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*Modeling the Long-Term
Performance of
WASTE Containment
Systems*

**PFOS and Related Fluorochemicals in
Human Blood from Several Countries**

Reduction of Cr(VI) at a Polyaniline Film

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THE AMERICAN
CHEMICAL SOCIETY

Characterization of Natural and Affected Environments

4465 Chemical Characterization of Ambient Particulate Matter near the World Trade Center: Elemental Carbon, Organic Carbon, and Mass Reconstruction

David A. Olson, Gary A. Norris, Matthew S. Landis, and Alan F. Vette
Longitudinal and spatial trends in ambient PM_{2.5} near the World Trade Center complex are characterized.

4474 Using Passive Air Samplers To Assess Urban–Rural Trends for Persistent Organic Pollutants. 1. Polychlorinated Biphenyls and Organochlorine Pesticides

Tom Harner, Mahiba Shoeib, Miriam Diamond, Gary Stern, and Bruno Rosenberg

Two types of samplers—polyurethane foam disks and semipermeable membrane devices—are used to measure semivolatile organic compounds in Toronto over an integrated time period.

4484 Tracking Polybrominated Diphenyl Ether Releases in a Wastewater Treatment Plant Effluent, Palo Alto, California

Karin D. North

Effluent and sludge at a wastewater treatment plant in California are analyzed for PBDEs; total PBDE concentrations in effluent discharge are estimated.

4489 Perfluorooctanesulfonate and Related Fluorochemicals in Human Blood from Several Countries

Kurunthachalam Kannan, Simonetta Corsolini, Jerzy Falandysz, Gilberto Fillmann, Kurunthachalam Senthil Kumar, Bommanna G. Loganathan, Mustafa Ali Mohd, Jesus Olivero, Nathalie Van Wouwe, Jae Ho Yang, and Kenneth M. Aldous

While perfluorooctanesulfonate predominates, results suggest that sources have varying levels and compositions of perfluorochemicals and that there are differences in exposure patterns to these chemicals in various countries.

4496 An FTIR-DRIFT Study on River Sediment Particle Structure: Implications for Biofilm Dynamics and Pollutant Binding

Tom Gallé, Barend Van Lagen, Andreas Kurtenbach, and Reinhard Bierl

DRIFT measurements of recently deposited river sediments suggest that hydrological regime strongly affects organic matter structure as well as metal binding and bioavailability in sediments.

4503 Uptake of Sediment-Bound Bioavailable Polychlorobiphenyls by Benthivorous Carp (*Cyprinus carpio*)

Caroline T. A. Moermond, Frank C. J. M. Roozen, John J. G. Zwolsman, and Albert A. Koelmans

Fast-desorbing PCB fractions explain bioaccumulation in benthivorous fish.

Environmental Processes

4510 Sorption of the Herbicide Dichlobenil and the Metabolite 2,6-Dichlorobenzamide on Soils and Aquifer Sediments

Liselotte Clausen, Flemming Larsen, and Hans-Jorgen Albrechtsen

Sorption of the herbicide dichlobenil and the metabolite 2,6-dichlorobenzamide on soils and aquifer sediments is studied, as well as effects of sediment composition, organic carbon, and redox status.

Notices to *ES&T* authors

1. Effective now, titles must be included in the Reference section of *ES&T* research papers.
2. Effective January 1, 2005, all *ES&T* research papers must be submitted via the Web (<https://paragon.acs.org/paragon/index.jsp>). Email submissions or paper copies will not be accepted.

4519 Food Web Pathway Determines How Selenium Affects Aquatic Ecosystems: A San Francisco Bay Case Study

A. Robin Stewart, Samuel N. Luoma, Christian E. Schlekot, Martina A. Doblin, and Kathryn A. Hieb

Specific differences in selenium uptake among primary consumers are propagated through the food web and result in differences in contaminant accumulation in top predators.

4527 Arsenic Speciation of Solvent-Extracted Leachate from New and Weathered CCA-Treated Wood

Bernine I. Khan, Helena M. Solo-Gabriele, Brajesh K. Dubey, Timothy G. Townsend, and Yong Cai

Arsenic species in leachates from new and weathered CCA-treated wood and ash of varying retentions are quantified by extraction using various solvents.

4535 Antimony(III) Binding to Humic Substances: Influence of pH and Type of Humic Acid

Johanna Buschmann and Laura Sigg

Chemical modeling of the pH-dependent binding of Sb(III) to three humic acids is consistent with two binding sites, which involve a phenolic and a carboxylic entity.

4542 Protection of Mesopore-Adsorbed Organic Matter from Enzymatic Degradation

Andrew R. Zimmerman, Jon Chorover, Keith W. Goyne, and Susan L. Brantley

Experiments show that organic substrates sorbed within mineral mesopores are unavailable to degradative enzymes and thus provide a possible mechanism for preserving sediment and soil organic matter.

4549 Effects of Particulate Carbonaceous Matter on the Bioavailability of Benzo[a]pyrene and 2,2',5,5'-Tetrachlorobiphenyl to the Clam, *Macoma balthica*

Pamela B. McLeod, Martine J. van den Heuvel-Greve, Richelle M. Allen-King, Samuel N. Luoma, and Richard G. Luthy

The bioavailability of a BaP and a PCB to *Macoma balthica* varied significantly according to the carbonaceous particle type to which they were bound.

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

4557

NO₂ Emissions from Agricultural Burning in São Paulo, Brazil

Clive Oppenheimer, Vitcho I. Tsanev, Andrew G. Allen, Andrew J. S. McGonigle, Arnaldo A. Cardoso, Antony Wiatr, William Paterlini, and Cristine de Mello Dias

New measurements of NO₂ emissions from agricultural burning were made with compact ultraviolet spectrometers.

4562

Effect of Tides on Solute Flushing from a Strait: Imaging Flow and Transport in the East River with SF₆

Theodore Caplow, Peter Schlosser, David T. Ho, and Rica C. Enriquez

The residence time of solutes in a tidal strait that connects two large bays is revealed to be a strong function of tidal phase at time of discharge.

4572

Metabolism and Mineralization of Hexahydro-1,3,5-trinitro-1,3,5-triazine Inside Poplar Tissues (*Populus deltoides* × *nigra* DN-34)

Benoit Van Aken, Jong M. Yoon, Craig L. Just, and Jerald L. Schnoor

Poplar tissue cultures can metabolize the explosive RDX through a light-dependent multi-step process that results in a partial mineralization of the molecule.

4580

Modeling of TCE Diffusion to the Atmosphere and Distribution in Plant Stems

Xingmao Ma and Joel Burken

According to modeling and validation experiments, VOCs can diffuse and subsequently volatilize to the atmosphere during phytoremediation.

4587

Reduction of Aqueous Chromate by Fe(II)/Fe(III) Carbonate Green Rust: Kinetic and Mechanistic Studies

Ludovic Legrand, Alaeddine El Figuigui, Florence Mercier, and Annie Chausse

Reduction of aqueous chromate by carbonate green rust is investigated, and a kinetic model based on the formation of successive Cr(III) monolayers is developed.

4596

Electrokinetic Transport of PAH-Degrading Bacteria in Model Aquifers and Soil

Lukas Y. Wick, Philipp A. Mattle, Pierre Wattiau, and Hauke Harms

An investigation is presented of the mobility, viability, and activity of polycyclic aromatic hydrocarbon degrading bacteria under electrokinetic conditions applied to model aquifers and soil.

4603

Reactions of the Flavonoid Hesperetin with Chlorine: A Spectroscopic Study of the Reaction Pathways

Junhe Lu, Mark M. Benjamin, Gregory V. Korshin, and Hervé Gallard

On the basis of a combination of absorbance spectroscopy and tandem mass spectrometry, the chlorination pathways for the flavonoid hesperetin, which is a model for natural organic material, are elucidated.

4612

Emissions of Air Pollutants from Household Stoves: Honeycomb Coal versus Coal Cake

Su Ge, Xu Xu, Judith C. Chow, John Watson, Qing Sheng, Weili Liu, Zhipeng Bai, Tan Zhu, and Junfeng Zhang

Concentrations, emission rates, and factors of PM, SO₂, NO_x, benzo[a]pyrene, fluoride, and toxic elements in PM are compared; the PM elemental source profile is characterized.

Environmental Modeling

■ 4619

Adaptation of Fugacity Models to Treat Speciating Chemicals with Constant Species Concentration Ratios

Liisa K. Toose and Donald Mackay

A "multiplier" method is developed whereby existing models that describe the fate of single-species chemicals can be adapted to estimate the fate of multispecies substances.

4627

Modeling Crude Oil Droplet-Sediment Aggregation in Nearshore Waters

Michael C. Sterling, Jr., James S. Bonner, Cheryl A. Page, Christopher B. Fuller, Andrew N. S. Ernest, and Robin L. Autenrieth

A modeling approach simulates changes in particle size distribution and density due to aggregation by extending the Smoluchowski kinetic model to particles of different density.

Environmental Measurements Methods

4635

A New Method for Separating HFC-134a from Gas Mixtures Using Clathrate Hydrate Formation

Yongwon Seo, Hideo Tajima, Akihiro Yamasaki, Satoshi Takeya, Takao Ebinuma, and Fumio Kiyono

A new method that uses gas hydrate formation is proposed for separating HFC-134a from gas mixtures containing nitrogen and HFC-134a.

4640

In-Line Laser Holography and Video Analysis of Eroded Floc from Engineered and Estuarine Sediments

Rupert G. Perkins, Hongyue Sun, John Watson, Mike A. Player, Giseler Gust, and David M. Paterson

Laser holography and video analysis demonstrated that sediment erosion threshold and eroded floc size are functions of sediment biogenic polymer content and benthic algal biomass.

Remediation and Control Technologies

4649

Compositions and Sorptive Properties of Crop Residue-Derived Chars

Yuan Chun, Guangyao Sheng, Cary T. Chiou, and Baoshan Xing

The effect of charring temperature on char composition and the effect of surface acidity on the char's performance in sorption of neutral organic contaminants are evaluated.

4656

In Situ Chemical Reduction of Aquifer Sediments: Enhancement of Reactive Iron Phases and TCE Dechlorination

Jim E. Szecsody, Jonathan S. Fruchter, Mark D. Williams, Vince R. Vermeul, and Debbie Sklarew

Neutral to high pH must be maintained since reduction generates H⁺; sequential extractions on reduced sediment show that adsorbed ferrous iron controls TCE reactivity.

4664

Activated Carbon and Tungsten Oxide Supported on Activated Carbon Catalysts for Toluene Catalytic Combustion

M. A. Alvarez-Merino, M. F. Ribeiro, J. M. Silva, F. Carrasco-Marín, and F. J. Maldonado-Hódar

Tungsten oxides supported on activated carbon are cheap catalysts for toluene combustion at low temperatures but need high tungsten loading and contact times.

4671

Reduction of Cr(VI) at a Polyaniline Film: Influence of Film Thickness and Oxidation State

Sinéad T. Farrell and Carmel B. Breslin

Reduction of highly toxic hexavalent chromium to the trivalent state occurs efficiently at thick polyaniline films in the leuco-emeraldine oxidation state.

■ 4677

TCLP Underestimates Leaching of Arsenic from Solid Residuals under Landfill Conditions

Amlan Ghosh, Muhammed Mukibi, and Wendell Ela

The Toxicity Characteristic Leaching Procedure is inappropriate for determining whether arsenic-bearing solid residuals of water treatment should be disposed of in nonhazardous landfills.

4683

Organic Fouling and Chemical Cleaning of Nanofiltration Membranes: Measurements and Mechanisms

Qilin Li and Menachem Elimelech

Measurements of foulant-membrane and foulant-foulant interaction forces provide valuable insights into molecular-level mechanisms of organic fouling and chemical cleaning of nanofiltration membranes.

4694

PCDD/F TEQ Indicators and Their Mechanistic Implications

Jeong-Eun Oh, Abderrahmane Touati, Brian K. Gullett, and James A. Mulholland

Stack-gas samples from two incinerator facilities are investigated to find toxic equivalent quantity indicators, and similarities in isomer patterns are examined.

Correspondence/Rebuttal

4701

Comment on "Critical Evaluation of Desorption Phenomena of Heavy Metals from Natural Sediments"

Astrid R. Jacobson and Philippe Baveye

4703

Response to Comment on "Critical Evaluation of Desorption Phenomena of Heavy Metals from Natural Sediments"

Yan Gao, Amy T. Kan, and Mason B. Tomson

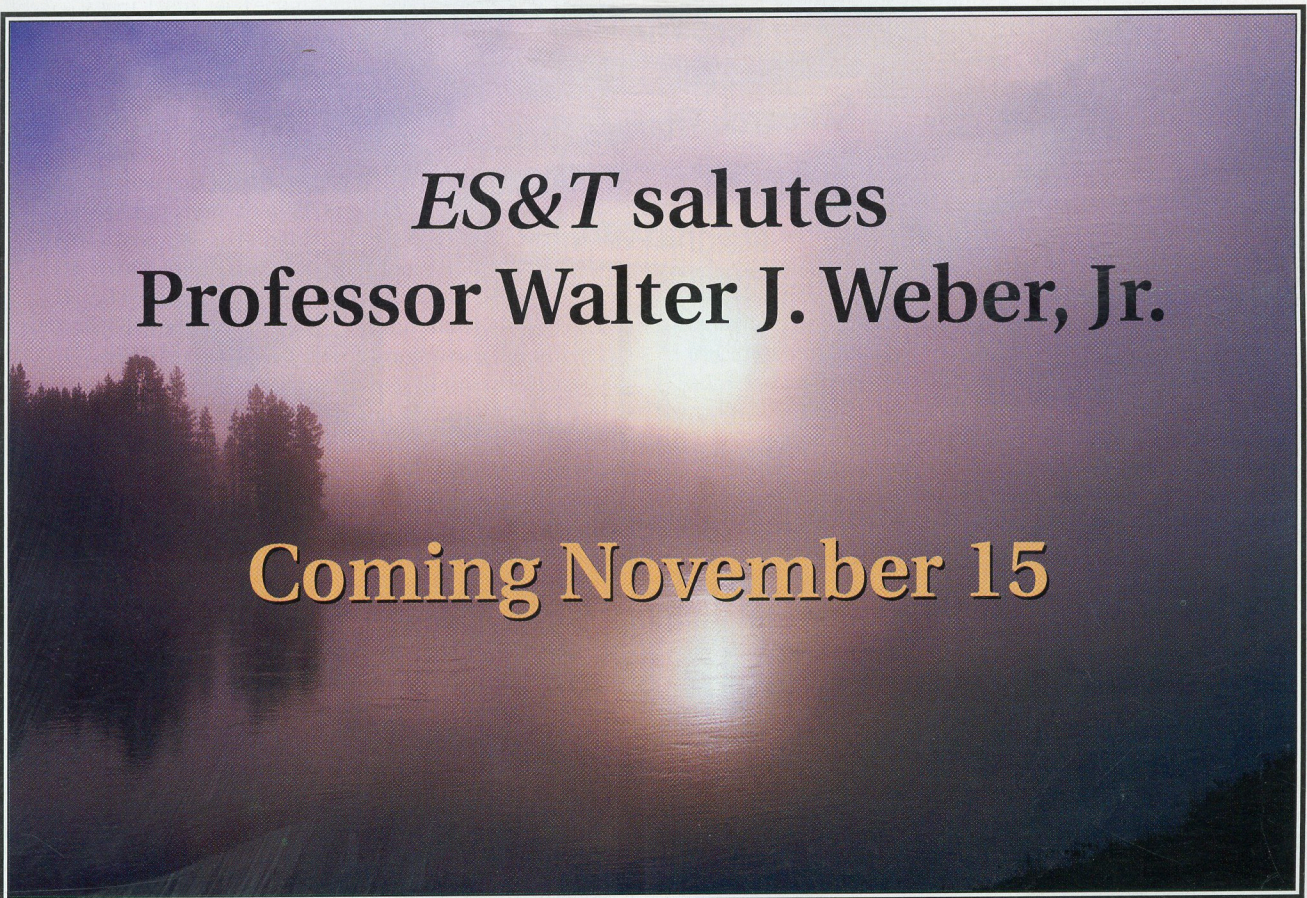
Additions and Corrections

4704

Formation of Carbonyl Sulfide by the Reaction of Carbon Monoxide and Inorganic Polysulfides

A. Kamyshny, Jr., A. Goifman, D. Rizkov, and O. Lev

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



ES&T salutes
Professor Walter J. Weber, Jr.

Coming November 15