July 15, 2004

Environmental Science & Technology

http://pubs.acs.org/est

Simultaneous Assessment *of* Sources, Processes, *and* Factors Influencing Herbicide LOSSES *to* Surface Waters

Chromium and Sediment Toxicity

Adsorptive and Absorptive Contributions to the Gas-Particle Partitioning of PAHs

PUBLISHED BY
THE AMERICAN
CHEMICAL SOCIETY

Research

Critical Review

Characterization of Natural and Affected Environments

Environmental Processes

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

▶ **This issue contains a news story about this research.**

■ **3892**

Exchange of Polychlorinated Biphenyls (PCBs) and Polychlorinated Naphthalenes (PCNs) between Air and a Mixed Pasture Sward

Jonathan L. Barber, Gareth O. Thomas, Rebekah Bailey, Gerhard Kerstiens, and Kevin C. Jones

Plant-side resistance to diffusion controls the air/plant exchange of PCBs and PCNs with grass-covered pastures, or swards.

3901

Rapid Release of Mercury from Intertidal Sediments Exposed to Solar Radiation: A Field Experiment

João Canário and Carlos Vale

Mercury concentration in anoxic inter-tidal sediments decreases considerably when exposed to solar radiation between high tides, and release is independent of the degree of contamination.

■ **3908**

Role of Dissolved Organic Matter, Nitrate, and Bicarbonate in the Photolysis of Aqueous Fipronil

Spencer S. Walse, Stephen L. Morgan, Li Kong, and John L. Ferry

A multivariate kinetic model of aqueous fipronil photodegradation is generated as a function of dissolved organic matter, bicarbonate, and nitrate at concentrations bracketing those commonly observed in natural waters.

■ **3916**

Experimental Visualization of Solute Transport and Mass Transfer Processes in Two-Dimensional Conductivity Fields with Connected Regions of High Conductivity

Brendan Zinn, Lucy C. Meigs, Charles F. Harvey, Roy Haggerty, William J. Peplinski, and Claudius Freiherr von Schwerin

Detailed visualization of solute transport through water-saturated porous-media chambers shows that solute tailing behaves very differently for different degrees of spatial variability in hydraulic conductivity.

3927

Contribution of Natural Organic Matter to Copper Leaching from Municipal Solid Waste Incinerator Bottom Ash

André van Zomeren and Rob N. J. Comans

Binding of copper to fulvic acids enhances leaching of this heavy metal from MSWI bottom ash and is adequately described by the NICA–Donnan model.

■ **3933**

Photochemical Fate of Sulfa Drugs in the Aquatic Environment: Sulfa Drugs Containing Five-Membered Heterocyclic Groups

Anne L. Boreen, William A. Arnold, and Kristopher McNeill

The aqueous photochemical degradation mechanisms of five sulfa drug antibiotics with varying five-membered heterocyclic substituents are investigated.

Environmental Modeling

3941

Thermodynamic Properties of Multifunctional Oxygenates in Atmospheric Aerosols from Quantum Mechanics and Molecular Dynamics: Dicarboxylic Acids

Chinghang Tong, Mario Blanco, William A. Goddard, III, and John H. Seinfeld

A method based on atomistic simulations combined with the Clausius–Clapeyron equation predicts liquid-vapor pressure, vaporization enthalpies, and heats of sublimation of atmospheric organic compounds.

Environmental Measurements Methods

3950

Estimation of Diffusion Coefficient of Chromium in Colloidal Silica Using Digital Photography

Netnapid Tantemsapya and Jay N. Meegoda

Diffusion coefficients of chromium are measured using a method based on digital photography to evaluate the effectiveness of treating chromium-contaminated soils using silica gel.

3958

Optimizing Detection Limits for the Analysis of Petroleum Hydrocarbons in Complex Environmental Samples

Gregory S. Douglas, William*A. Burns, A. Edward Bence, David S. Page, and Paul Boehm

The interpretive power of forensic PAH measurements is greatly improved by optimizing method detection limits of the alkylated PAH homologues.

■ **3965**

Potential Contamination of Shipboard Air Samples by Diffusive Emissions of PCBs and Other Organic Pollutants: Implications and Solutions

Rainer Lohmann, Foday M. Jaward, Louise Durham, Jonathan L. Barber, Wendy Ockenden, Kevin C. Jones, Regina Bruhn, Soenke Lakaschus, Jordi Dachs, and Kees Booij

Great care is needed to ensure that shipboard ambient measurements of persistent organic pollutants are not contaminated.

3971

Aesthetics of Simulated Soiling Patterns on Architecture

Carlota M. Grossi and Peter Brimblecombe

Soiling patterns, in addition to the soiling amount, influence the public acceptability of soiled building facades.

3977

Comparison between Acetic Acid and Landfill Leachates for the Leaching of Pb(II), Cd(II), As(V), and Cr(VI) from Cementitious Wastes

Cheryl E. Halim, Jason A. Scott, Helena Natawardaya, Rose Amal, Donia Beydoun, and Gary Low

Use of acetic acid (a toxicity characteristic leaching procedure leaching fluid) and municipal and nonputrescible landfill leachates for leaching heavy metals from cement is compared.

Remediation and Control Technologies

3984

Formate Ion Decomposition in Water Under UV Irradiation at 253.7 nm

Gonca F. Talu and Vasil Diyamandoglu

Formate decays in water under UV irradiation (253.7 nm) in the presence of dissolved oxygen to form CO_2 following split-rate pseudo-zero-order kinetics.

3994

Radiation Chemistry of Methyl *tert*-Butyl Ether in Aqueous Solution

Stephen P. Mezyk, Jace Jones, William J. Cooper, Thomas Tobien, Michael G. Nickelsen, J. Wesley Adams, Kevin E. O'Shea, David M. Bartels, James F. Wishart, Paul M. Tornatore, Kimberley S. Newman, Kellie Gregoire, and Daniel J. Weidman

Determination of rate constants for methyl *tert*-butyl ether destruction in water using advanced oxidation technology-based free radicals.

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