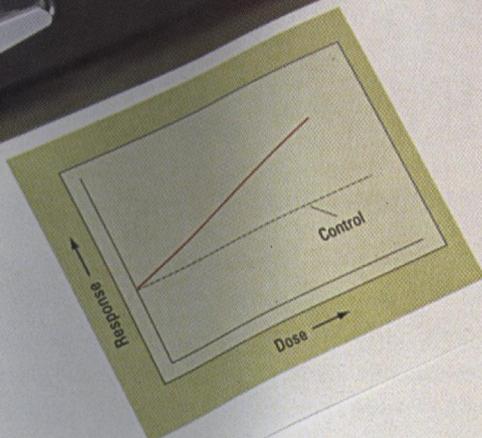


March 1, 2004

ENVIRONMENTAL Science & Technology

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Redrawing the **Dose-Response Curve**

**Indoor and Outdoor Air Concentrations and
Phase Partitioning of Perfluoroalkyl
Sulfonamides and PBDEs**

**Atmospheric Transport of PBDEs and
PCBs to the Baltic Sea**

**PUBLISHED BY
THE AMERICAN
CHEMICAL SOCIETY**

Critical Reviews

■ 1265

Hydrocarbon Spills on Antarctic Soils: Effects and Management

Jackie M. Aislabie, Megan R. Balks, Julia M. Foght, and Emma J. Waterhouse

Researchers review the effects and management of hydrocarbon spills, the most common human impact on Antarctic soils.

Policy Analysis

1275

Classification Criteria and Probability Risk Maps: Limitations and Perspectives

Michaela Saisana, Gregoire Dubois, Archontoula Chaloulakou, and Nikolas Spyrellis

Comparing alternative criteria for area classification under uncertainty shows that the appropriate criteria can be supported by the data distribution and the environmental regulatory standard.

Characterization of Natural and Affected Environments

1282

► **Atmospheric Transport of Polybrominated Diphenyl Ethers and Polychlorinated Biphenyls to the Baltic Sea**

Arnout F. H. ter Schure, Per Larsson, Cecilia Agrell, and Jan P. Boon

Concentrations of PBDEs in air and atmospheric deposition at a remote station are compared to those of PCBs to assess their atmospheric transport potential.

1288

Speciation of Hepatic Zn in Trout Exposed to Elevated Waterborne Zn Using X-ray Absorption Spectroscopy

Suzanne Beauchemin, Dean Hesterberg, Jennifer Nadeau, and James C. McGeer

X-ray absorption spectroscopy on freeze-dried trout liver samples provides direct evidence for hepatic Zn binding to four sulfurs in a Zn-cysteine-like structure.

1296

Diurnal Variations of Individual Organic Compound Constituents of Ultrafine and Accumulation Mode Particulate Matter in the Los Angeles Basin

Philip M. Fine, Bhabesh Chakrabarti, Meg Krudysz, James J. Schauer, and Constantinos Sioutas

Atmospheric concentrations of organic compound source tracers are measured in size-fractionated particulate matter samples collected at different times of the day in southern California.

1305

► **Persistent Organic Pollutants in Alaskan Murre (*Uria* spp.) Eggs: Geographical, Species, and Temporal Comparisons**

Stacy S. Vander Pol, Paul R. Becker, John R. Kucklick, Rebecca S. Pugh, David G. Roseneau, and Kristin S. Simac

Researchers show that significant regional and species variations in murre egg contaminants may be related to transport patterns and subtle trophic differences.

1313

► **Indoor and Outdoor Air Concentrations and Phase Partitioning of Perfluoroalkyl Sulfonamides and Polybrominated Diphenyl Ethers**

Mahibrah Shoeib, Tom Harner, Michael Ikonomou, and Kurunthachalam Kannan

Air concentrations, particle-gas partitioning, and physical-chemical properties are assessed for two classes of "domestic" chemicals—polybrominated diphenyl ethers and perfluoroalkyl sulfonamides.

1321

pH Neutralization and Zonation in Alkaline-Saline Tank Waste Plumes

Jiamin Wan, Joern T. Larsen, Tetsu K. Tokunaga, and Zuoping Zheng

A pH-neutralized zone is observed at the front of alkaline-saline waste plumes, and causes are identified.

1330

Use of ⁸⁷Sr/⁸⁶Sr and δ^{11} B To Identify Slag-Affected Sediment in Southern Lake Michigan

E. Randall Bayless, Thomas D. Bullen, and John A. Fitzpatrick

Analysis of ⁸⁷Sr/⁸⁶Sr and δ^{11} B indicated that slag deposition in northern Indiana has affected 82–154 km² of Lake Michigan bed sediments.

1338

Source Identification of Volatile Organic Compounds in Houston, Texas

Weixiang Zhao, Philip K. Hopke, and Thomas Karl

The VOC sources in La Porte, Houston, and their important features have been identified with an extended factor analysis model.

1348

The Rise and Fall of Mercury Methylation in an Experimental Reservoir

Vincent L. St. Louis, John W. M. Rudd, Carol A. Kelly, R. A. (Drew) Bodaly, Michael J. Paterson, Kenneth G. Beaty, Raymond H. Hesslein, Andrew Heyes, and Andrew R. Majewski

Mercury methylation in flooded peat is stimulated for only 3 years following reservoir creation, but methyl mercury concentrations in biota remain high for much longer.

1359

Stable Isotope Pulse-Chasing and Compound Specific Stable Carbon Isotope Analysis of Phospholipid Fatty Acids To Assess Methane Oxidizing Bacterial Populations in Landfill Cover Soils

Zoë M. Crossman, Faye Abraham, and Richard P. Evershed

Different landfill cover materials are shown to affect the composition of methane-oxidizing bacterial communities through the depth profiles of the caps.

■ 1368

Organochlorine Pesticides in the Air around the Taihu Lake, China

Xinghua Qiu, Tong Zhu, Jing Li, Hansheng Pan, Quanlin Li, Guofang Miao, and Jicheng Gong

Concentrations of organochlorine pesticides in air around a China lake in the summer of 2002 are reported, and possible sources of OC pesticides are discussed.

■ 1375

Particle-Water Partitioning of PCBs in the Photic Zone: A 25-Month Study in the Open Baltic Sea

Anna Sobek, Örjan Gustafsson, Susanna Hajdu, and Ulf Larsson

Partitioning of PCBs to surface water biogenic particulate organic carbon is described as an equilibrium process, irrespective of large variations in biogeochemical parameters.

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

► This issue contains a news story about this research.

1383

Retention of Trace Metals by Solidified/Stabilized Wastes: Assessment of Long-Term Metal Release

R. Badreddine, A.-N. Humez, U. Mingelgrin, A. Béchara, F. Meducin, and R. Prost

Trace metal salts are held in solidified/stabilized materials produced by the Ecofix process mainly by incorporation in C-S-H phases.

1399

Use of Spectroscopic Techniques for Uranium(VI)/Montmorillonite Interaction Modeling

A. Kowal-Fouchard, R. Drot, E. Simoni, and J. J. Ehrhardt

Surface complexation modeling of U(VI) sorbed onto Na-montmorillonite is completed according to combined spectrofluorimetry and XPS investigations.

■ 1408

Abiotic Transformation of Hexahydro-1,3,5-trinitro-1,3,5-triazine by Fe^{II} Bound to Magnetite

Kelvin B. Gregory, Philip Larese-Casanova, Gene F. Parkin, and Michelle M. Scherer

The kinetics and products resulting from a novel, abiotic transformation of RDX by surface-associated iron species are observed.

1415

Organotin Compounds in the Liver Tissue of Marine Mammals from the Polish Coast of the Baltic Sea

Tomasz Ciesielski, Andrzej Wasik, Iwona Kuklik, Krzysztof Skóra, Jacek Namieśnik, and Piotr Szefer

Concentrations of organotins in liver of the harbor porpoises studied reflect a high degree of tributyltin pollution along the Polish coast of the Baltic Sea.

1421

In Situ Speciation of Ni and Zn in Freshwaters: Comparison between DGT Measurements and Speciation Models

Hao Zhang

Chemical speciation of Ni and Zn in natural water measured by DGT (diffusive gradients in thin films) is successfully predicted by metal-humic binding models.

■ 1428

Formation of Oligomers in Secondary Organic Aerosol

Michael P. Tolocka, Myoseon Jang, Joy M. Ginter, Frederick J. Cox, Richard M. Kamens, and Murray V. Johnston

The formation of oligomeric molecules, an important step in secondary organic aerosol production, is reported.

1435

Determination of Monochloramine Formation Rate Constants with Stopped-Flow Spectrophotometry

Zhimin Qiang and Craig D. Adams

This study reported that monochloramine is generated by the nonionic reaction between HOCl and NH₃ with a specific rate constant of $3.07 \times 10^6 \text{ (M}^{-1} \text{ s}^{-1})$ at 25 °C and an Arrhenius equation of $k = 5.40 \times 10^9 \exp(-2237/T)$.

1445

Characterization and Fate of N-Nitrosodimethylamine Precursors in Municipal Wastewater Treatment Plants

William A. Mitch and David L. Sedlak

NDMA formation during wastewater disinfection is attributable to amine-containing sludge treatment polymers and low-molecular-weight amines but not the known NDMA precursor dimethylamine.

1455

Time-Resolved Laser Fluorescence Spectroscopy Study on the Interaction of Curium(III) with *Desulfovibrio aspoënsis* DSM 10631T

H. Moll, Th. Stumpf, M. Merroun, A. Rossberg, S. Selenska-Pobell, and G. Bernhard

Time-resolved laser fluorescence measurements indicate the formation of an inner-sphere surface complex of Cm(III) onto the cell envelope of the novel sulfate-reducing bacterium *Desulfovibrio aspoënsis*.

■ 1460

Sorption and Degradation of Steroid Hormones in Soils during Transport: Column Studies and Model Evaluation

B. S. Das, L. S. Lee, P. S. C. Rao, and R. P. Hultgren

Coupled sorption and transformation of steroid hormones during transport under steady, saturated flow are examined using packed columns and model simulations.

■ 1471

Simulating Organic Aerosol Formation during the Photooxidation of Toluene/NO_x Mixtures: Comparing the Equilibrium and Kinetic Assumption

Craig A. Stroud, Paul A. Makar, Diane V. Michelangeli, Michael Mozurkewich, Donald R. Hastie, Andreea Barbu, and Janya Humble

An aerosol box model is used to predict organic aerosol speciation during the photooxidation of toluene/NO_x mixtures.

1480

Investigation of Pyrochlore-Based U-Bearing Ceramic Nuclear Waste: Uranium Leaching Test and TEM Observation

Huifang Xu, Yifeng Wang, Pihong Zhao, William L. Bourcier, Richard Van Konyenburg, and Henry F. Shaw

Uranium leaching rate of a ceramic waste form of U-bearing pyrochlore is controlled/limited by a titania-rich leached layer.

1487

Geochemical Controls on the Production and Distribution of Methylmercury in Near-Shore Marine Sediments

Chad R. Hammerschmidt and William F. Fitzgerald

Biochemical factors influencing mercury methylation and monomethylmercury concentrations in Long Island Sound sediments are investigated.

1496

Bioaccumulation, Biotransformation, and Biochemical Effects of Brominated Diphenyl Ethers in Juvenile Lake Trout (*Salvelinus namaycush*)

Gregg T. Tomy, Vince P. Palace, Thor Halldorson, Eric Brækevelt, Robert Danell, Kerry Wautier, Bob Evans, Lyndon Brinkworth, and Aaron T. Fisk

Debromination highly influences bioaccumulation of BDEs by lake trout.

Environmental Modeling

■ 1505

Influence of Vegetation on the Environmental Partitioning of DDT in Two Global Multimedia Models

F. Wegmann, M. Scheringer, M. Möller, and K. Hungerbühler

In two global multimedia models, the influence of a vegetation compartment and varying soil OC content on the partitioning of DDT is analyzed.

■ 1513

Modeling Lead Input and Output in Soils Using Lead Isotopic Geochemistry

R. M. Semlali, J.-B. Dessogne, F. Monna, J. Bolte, S. Azimi, N. Navarro, L. Denaix, M. Loubet, C. Chateau, and F. van Oort

A model developed from a 70-year-old soil archive indicates negligible post-depositional migration of lead at the human time scale.

■ 1522

A Two-Front Leach Model for Cement-Stabilized Heavy-Metal Waste

Mohammad Z. Islam, Lionel J. J. Catalan, and Ernest K. Yanful