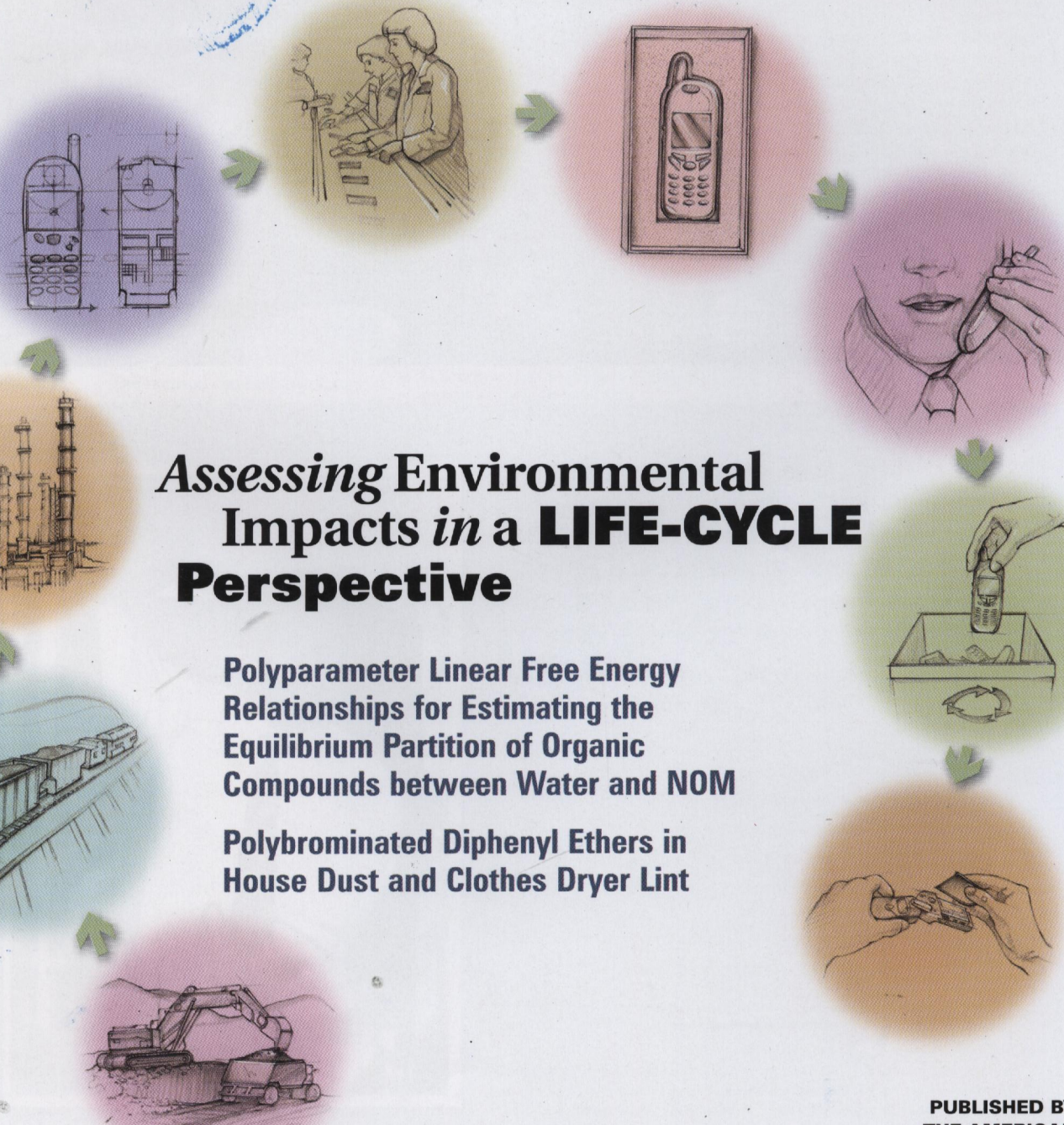


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Assessing Environmental Impacts *in a* **LIFE-CYCLE** Perspective

Polyparameter Linear Free Energy
Relationships for Estimating the
Equilibrium Partition of Organic
Compounds between Water and NOM

Polybrominated Diphenyl Ethers in
House Dust and Clothes Dryer Lint

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Critical Review

913

Polyparameter Linear Free Energy Relationships for Estimating the Equilibrium Partition of Organic Compounds between Water and the Natural Organic Matter in Soils and Sediments

Thanh H. Nguyen, Kai-Uwe Goss, and William P. Ball

Sorption of polar and nonpolar chemicals to soil/sediment organic matter can be estimated through a polyparameter linear free energy relationship developed from 356 critically reviewed K_{oc} values.

Characterization of Natural and Affected Environments

925

► Polybrominated Diphenyl Ethers in House Dust and Clothes Dryer Lint

Heather M. Stapleton, Nathan G. Dodder, John H. Offenberg, Michele M. Schantz, and Stephen A. Wise

Levels of PBDEs are investigated in house dust from the Washington, D.C., area; estimates of potential PBDE intake for young children via dust are calculated.

932

Size-Fractionated Measurements of Ambient Ultrafine Particle Chemical Composition in Los Angeles Using the NanoMOUDI

Satya B. Sardar, Philip M. Fine, Paul R. Mayo, and Constantinos Sioutas

Ultrafine mass concentrations vary from 0.86 to 3.5 $\mu\text{g}/\text{m}^3$; the highest concentrations were observed in the fall.

■ 945

Assessment of Natural Attenuation via in Situ Reductive Dechlorination of Polychlorinated Biphenyls in Sediments of the Twelve Mile Creek Arm of Lake Hartwell, SC

Usarat Pakdeesusuk, Cindy M. Lee, John T. Coates, and David L. Freedman

Two cores collected 11 years apart show continued dechlorination at selected depths with low total PCBs and little dechlorination at other depths with higher concentrations.

953

Occurrence of Some Organic UV Filters in Wastewater, in Surface Waters, and in Fish from Swiss Lakes

Marianne E. Balmer, Hans-Rudolf Buser, Markus D. Müller, and Thomas Poiger

Input pathways to surface waters and bioconcentration in fish of four important UV filters are compared to the chemical marker methyl triclosan.

963

Characterization of High Molecular Weight Disinfection By-products from Chlorination of Humic Substances with/without Coagulation Pretreatment Using UF-SEC-ESI-MS/MS

Xiangru Zhang, Roger A. Minear, and Sylvia E. Barrett

High-molecular-weight DBPs from the chlorination of humic substances are characterized both with and without coagulation pretreatment.

■ 973

Distribution of Volatile Organic Compounds over a Semiconductor Industrial Park in Taiwan

Kong-Hwa Chiu, Ben-Zen Wu, Chih-Chung Chang, Usha Sree, and Jiunn-Guang Lo

Notices to *ES&T* authors

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2. Effective now, 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.

Volatile organic emissions from quickly expanding high-tech industries play a vital role in atmospheric chemistry; at ground level, these emissions adversely influence the surrounding microenvironment.

984

Storm Disturbance of Sediment Contaminants at a Hot Spot in the Baltic Sea Assessed by ^{234}Th Radionuclide Tracer Profiles

Michael Kersten, Thomas Leipe, and Franz Tauber

Sediment down to a depth of 10 cm is partially exchanged after a gale event.

■ 991

Patterns of Household Concentrations of Multiple Indoor Air Pollutants in China

Gongli He, Bo Ying, Jiang Liu, Shirong Gao, Shaolin Shen, Kalpana Balakrishnan, Yinlong Jin, Fan Liu, Ning Tang, Kai Shi, Enis Baris, and Majid Ezzati

Multiple pollutants, including respirable particles, carbon monoxide, sulfur dioxide, fluoride, and arsenic, are monitored at four points inside homes that use coal and/or biomass fuels.

999

Seasonal and Spatial Relationship of Chemistry and Toxicity in Atmospheric Particulate Matter Using Aquatic Bioassays

Rebecca J. Sheesley, James J. Schauer, Jocelyn D. Hemming, Steve Geis, and Miel A. Barman

Atmospheric particulate matter is extracted with water or dichloromethane, transferred to dimethyl sulfoxide, and diluted in water. Researchers expose water fleas and green algae to this preparation to study the toxic effects.

Environmental Processes

1011

Experimentally Derived Sticking Efficiencies of Micro-particles Using Atomic Force Microscopy

Tracy L. Cail and Michael F. Hochella, Jr.

Researchers use AFM measurements and the interaction force boundary layer model to investigate the sticking efficiency of inorganic colloidal particles.

■ 1018

► New Evaluation Scheme for Two-Dimensional Isotope Analysis to Decipher Biodegradation Processes: Application to Groundwater Contamination by MTBE

Luc Zwank, Michael Berg, Martin Elsner, Torsten C. Schmidt, René P. Schwarzenbach, and Stefan B. Haderlein

2-D isotope analysis and re-evaluation of empirical isotopic enrichment factors reveal that anaerobic biodegradation dominates biodegradation of MTBE and follows an SN_2 -type reaction mechanism.

■ Supporting information is available free at <http://pubs.acs.org/est>.

► This issue contains a news story about this research.

1030

Monitoring OH-Initiated Oxidation Kinetics of Isoprene and Its Products Using Online Mass Spectrometry

Woojin Lee, Munkhbayar Baasandorj, Philip S. Stevens, and Ronald A. Hites

Under low NO_x conditions, some hydroperoxides and hydroxy-carbonyls produced from OH-initiated isoprene oxidation may be significant sources of atmospheric methyl vinyl ketone and 3-methylfuran.

1037

Sonolytic Desorption of Mercury from Aluminum Oxide

Ziqi He, Samuel J. Traina, Jerry M. Bigham, and Linda K. Weavers

Ultrasound promotes rapid Hg(II) desorption that decreases at longer sonication times because of occlusion by aluminum re-precipitation.

1045

Is Benzene a Precursor for Secondary Organic Aerosol?

Montserrat Martín-Reviejo and Klaus Wirtz

Smog chambers demonstrate aerosol formation during photochemical oxidation of benzene in various NO_x regimes; the effects of initial NO_x explain a threshold.

■ 1055

Model Polymer Release System Study of PAH Bioaccessibility: The Relationship between "Rapid" Release and Bioaccessibility

Mona Wells, Lukas Y. Wick, and Hauke Harms

Bioaccessibility is not restricted to "rapidly" released contaminants and empirical fitting parameters; this study suggests that it results from underlying factors governing mass transport.

1064

Carbon Isotopic Fractionation during Aerobic Vinyl Chloride Degradation

Michelle M. G. Chartrand, Alison Waller, Timothy E. Mattes, Martin Elsner, Georges Lacrampe-Couloume, James M. Gossett, Elizabeth A. Edwards, and Barbara Sherwood Lollar

Carbon isotope enrichment factors measured during aerobic vinyl chloride degradation are significantly smaller than those measured during anaerobic vinyl chloride degradation.

1071

Abiotic Production of Methylmercury by Solar Radiation

Steven D. Siciliano, Nelson J. O'Driscoll, Robert Tordon, Jonathan Hill, Stephen Beauchamp, and David R. S. Lean

Solar radiation produces MeHg(I) in natural water samples in certain lakes in a dissolved-organic-matter-dependent manner.

1078

Anaerobic Degradation of Decabromodiphenyl Ether

Andreas C. Gerecke, Paul C. Hartmann, Norbert V. Heeb, Hans-Peter E. Kohler, Walter Giger, Peter Schmid, Markus Zennegg, and Martin Kohler

Slow reductive debromination of decabromodiphenyl ether into nona- and octabromodiphenyl ethers is observed under anaerobic conditions in digested sewage sludge.

1084

Effect of Chlorophyllin-Chitosan on Excretion of Dioxins in a Healthy Man

Kimiyoichi Kitamura, Minako Nagao, Hikoya Hayatsu, and Masatoshi Morita

The effects of chitosan and chlorophyllin-chitosan on the excretion of 29 congeners of dioxins in the feces and sebum of a healthy man are examined.

1092

Role of Humic Acid and Quinone Model Compounds in Bromate Reduction by Zerovalent Iron

Li Xie and Chii Shang

Reactivity of Fe(0) toward bromate declines in the presence of humic acid, but reactive Fe(II) can be reductively formed by quinone-phenol moieties in humic acid.

1101

Nitration and Photonitration of Naphthalene in Aqueous Systems

Davide Vione, Valter Maurino, Claudio Minero, and Ezio Pelizzetti

Several nitration pathways of naphthalene in aqueous solution to yield 1- and 2-nitronaphthalene, in the dark and under irradiation, are discussed.

Environmental Modeling

■ 1111

Modeling MTBE and BTEX in Lakes and Reservoirs Used for Recreational Boating

Prescott C. Heald, S. Geoffrey Schladow, John E. Reuter, and Brant C. Allen

Work with a stratified lake model that includes detailed VOC loading data suggests that degradative processes have a significant role in VOC loss from lakes.

■ 1119

Multimedia Fate and Human Intake Modeling: Spatial versus Nonspatial Insights for Chemical Emissions in Western Europe

David W. Pennington, Manuele Margni, Christoph Ammann, and Olivier Jolliet

Spatial resolution in multimedia fate and multipathway exposure models related to emissions in Western Europe are discussed.

1129

Source Identification of Fine Particles in Washington, DC, by Expanded Factor Analysis Modeling

Bilkis A. Begum, Philip K. Hopke, and Weixiang Zhao

Additional information—including wind direction and speed, weekend/weekday activities, and time of year—helps to reveal more sources and provides separation of diesel from gasoline emissions.

1138

Three-Parameter Empirical Isotherm Model: Its Application to Sorption onto Organoclays

Dong-Ik Song and Won Sik Shin

Superior to the Langmuir and Freundlich models, this new model has nearly the same "goodness-of-fit" as the Redlich-Peterson and dual-mode models, while providing the partition coefficient in the Henry's law region.

Environmental Measurements Methods

1144

Transmission Electron Microscopy Investigation of Ultrafine Coal Fly Ash Particles

Yuanzhi Chen, Naresh Shah, Frank E. Huggins, and Gerald P. Huffman

High-resolution transmission electron microscopy, energy-dispersive X-ray spectroscopy, and electron diffraction are used to examine the ultrafine particles produced by combustion of three U.S. coals.

■ 1152

Accumulation of Organochlorine Pesticides from Water Using Triolein-Embedded Cellulose Acetate Membranes

Yiping Xu, Zijian Wang, Runhui Ke, and Shahamat U. Khan

A new type of composite membrane, with triolein embedded in the matrix of cellulose acetate polymers, can quickly and efficiently accumulate hydrophobic organochlorine pesticides from water.

1158

Determination of Interstitial Water Chemistry and Porosity in Consolidated Aquifer Materials by Diffusion Equilibrium-Exchange

Michael J. Spence, Steven F. Thornton, Simon H. Bottrell, and Keith H. Spence

A novel method that uses diffusion equilibrium-exchange is presented for the determination of VOC and electron acceptor concentrations in interstitial waters from contaminated consolidated aquifers.

1167

Diffusive Gradients in Thin Films Sampler Predicts Stress in Brown Trout (*Salmo trutta* L.) Exposed to Aluminum in Acid Fresh Waters

Oddvar Royset, Bjorn Olav Rosseland, Torstein Kristensen, Frode Krogglund, Oyvind Aaberg Garmo, and Eiliv Steinnes

Diffusive gradients in thin films' time-averaged values of toxic aluminum species in acid water are a new predictor for gill uptake and physiological stress in brown trout (*Salmo trutta* L.).

Remediation and Control Technologies

1175

Efficient Visible-Light-Induced Photocatalytic Disinfection on Sulfur-Doped Nanocrystalline Titania

Jimmy C. Yu, Wingkei Ho, Jianguo Yu, Hoyin Yip, Po Keung Wong, and Jincai Zhao

Doping of sulfur ion extends the photoresponse of TiO₂ photocatalyst to the range of visible light; photogenerated hydroxyl radicals produce considerable bactericidal effects on *Micrococcus lylae*.

1180

Denitrification Mechanism in Combustion of Biocoal Briquettes

Heejoon Kim and Tianji Li

Denitrification mechanisms in volatile combustion and char combustion are examined, and a model of oxygen distribution in a burning coal briquette is used.

1184

Flue Gas Treatment for SO₂ Removal with Air-Sparged Hydrocyclone Technology

Romuald P. Bokotko, Jan Hupka, and Jan D. Miller

A high concentration of fine gas bubbles, which have a directed motion within the air-sparged hydrocyclone unit, can remove SO₂ from various industrial gas streams by absorption.

1190

Neutralization of 4,6-Dinitro-*o*-cresol Waste Pesticide by Means of Detonative Combustion

Jolanta Bieganska

4,6-Dinitro-*o*-cresol is not detectable after detonative combustion and the soil extract has no apparent toxicity to plants; this confirms the absence of this vestigial herbicide.

Correspondence and Rebuttal

1197

Comment on "Addition of Carbon Sorbents to Reduce PCB and PAH Bioavailability in Marine Sediments: Physicochemical Tests"

Walter J. Weber, Jr.

1199

Response to Comment on "Addition of Carbon Sorbents to Reduce PCB and PAH Bioavailability in Marine Sediments: Physicochemical Tests"

John R. Zimmerman, Richard G. Luthy, Upal Ghosh, Rod N. Millward, and Todd S. Bridges

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