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ENVIRONMENTAL Science & Technology

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Source Strengths of **Ultrafine and Fine** **PARTICLES** Due to Cooking

Measurement of Contemporary and
Fossil Carbon Content of PM_{2.5} Aerosols

Experimental Study of the Adsorption of
an Ionic Liquid onto Surfaces

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News

141A Cooking spews out ultrafine particles

More than two years of measurements finds that routine cooking generates lots of potentially harmful particles.

142A White House denies scientific manipulation

Allegations include suppressing environmental data and manipulating reports.

143A Administration drops pesticide consultations

Bush administration proposal, drafted by industry, would harm endangered species, critics charge.

144A Mercury woes appear to grow

Children are at greater risk from the metal than previously believed.

143A News Briefs

Ozone, fine dust plague Great Lakes air • Campus climate changing

Department

137A Research Table of Contents

Meetings Calendar: An up-to-date listing of environmental conferences and workshops is available free on the Web at <http://pubs.acs.org/est>.

Cover: What's cooking in this Photodisc image? According to new research, it may be lots of ultrafine particles.

Research

Characterization of Natural and Affected Environments

2289

Direct Identification of Trace Metals in Fine and Ultrafine Particles in the Detroit Urban Atmosphere

Satoshi Utsunomiya, Keld A. Jensen, Gerald J. Keeler, and Rodney C. Ewing

Trace metals in the fine and ultrafine particle fraction in a Detroit urban aerosol occur as distinct metal compounds attached to the surfaces of large particles.

2298

Biomagnification of α - and γ -Hexabromocyclododecane Isomers in a Lake Ontario Food Web

Gregg T. Tomy, Wes Budakowski, Thor Halldorson, D. Michael Whittle, Micahel J. Keir, Chris Marvin, Gordia MacInnis, and Mehran Alaei

α - and γ -HBCD isomers are biomagnifying to a similar extent as *p*, *p'*-DDE and SPCBs in a food web from Lake Ontario.

2304

► Source Strengths of Ultrafine and Fine Particles Due to Cooking with a Gas Stove

Lance A. Wallace, Steven J. Emmerich, and Cynthia Howard-Reed

A major indoor source of respirable particles is cooking, particularly frying; source strengths for more than 120 size categories from 0.01 to 2.5 μ m are calculated.

2312

Global Pollution Monitoring of Polybrominated Diphenyl Ethers Using Skipjack Tuna as a Bioindicator

Daisuke Ueno, Natsuko Kajiwara, Hiroyuki Tanaka, Annamalai Subramanian, Gilberto Fillmann, Paul K. S. Lam, Gene J. Zheng, Muswerry Muchitar, Hamidah Razak, Maricar Prudente, Kyu-Hyuck Chung, and Shinsuke Tanabe

Global pollution of polybrominated diphenyl ethers in offshore waters and open seas is monitored using skipjack tuna as a bioindicator.

2317

Receptor Model Comparisons and Wind Direction Analyses of Volatile Organic Compounds and Submicrometer Particles in an Arid, Binational, Urban Air Shed

Shaibal Mukerjee, Gary A. Norris, Luther A. Smith, Christopher A. Noble, Lucas M. Neas, A. Haluk Özkaynak, and Melissa Gonzales

VOC source contributions are estimated with two receptor models and compared with particle counts to evaluate overall and directional source influences in a U.S.–Mexico border region.

2328

Long-Term Recovery of PCB-Contaminated Surface Sediments at the Sangamo-Weston/Twelvemile Creek/Lake Hartwell Superfund Site

Richard C. Brenner, Victor S. Magar, Jennifer A. Ickes, Eric A. Foote, James E. Abbott, Linda S. Bingle, and Eric A. Crecelius

Natural recovery of PCB-contaminated lake sediments resulted in reduced surface sediment concentrations since PCB use terminated in 1977; age dating and vertical PCB profiles were used to predict future recovery rates.

2338

Polybromodiphenyl Ether Flame Retardants in Fish from Lakes in European High Mountains and Greenland

Ingrid Vives, Joan O. Grimalt, Silvia Lacorte, Miriam Guillamón, Damià Barceló, and Björn O. Rosseland

Polybromodiphenyl esters are widespread in various trout species from high-altitude mountain lakes as a consequence of long-range atmospheric transport.

2345

Preliminary Assessment of U.K. Human Dietary and Inhalation Exposure to Polybrominated Diphenyl Ethers

Stuart Harrad, Ramanee Wijesekera, Stuart Hunter, Chris Halliwell, and Robert Baker

Median dietary and inhalation SPBDE exposures are 90.5 and 6.9 ng/person/day, respectively; elevated concentrations in indoor environments mean inhalation exposures may be higher.

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

► This issue contains a news story about this research.

Environmental Processes

2351

Effects of Dissolved Organic Matter Surrogates on the Partitioning of 17 β -Estradiol and *p*-Nonylphenol between Synthetic Membrane Vesicles and Water

Hiroshi Yamamoto, Howard M. Liljestrand, and Yoshihisa Shimizu

Sorption coefficients of dissolved organic matter surrogates by liposome are determined, and their effects on the liposome/water partitioning of 17 β -estradiol and *p*-nonylphenol are examined.

2359

Biodegradation of Linear Alkylbenzene Sulfonates and Their Degradation Intermediates in Seawater

Víctor M. León, Abelardo Gómez-Parra, and Eduardo González-Mazo

Linear alkylbenzene sulfonates and their degradation intermediates, sulfophenylcarboxylic acids, are degraded completely in seawater under aerobic conditions at 25 and 10 °C.

2368

Arsenic Removal from Aqueous Solution via Ferrihydrite Crystallization Control

William R. Richmond, Mitch Loan, Jonathon Morton, and Gordon M. Parkinson

The degree of supersaturation with respect to the iron oxide phase is shown to be a key factor in controlling the removal of arsenic by coprecipitation with ferrihydrite.

2373

Fate of Elemental Mercury in the Arctic during Atmospheric Mercury Depletion Episodes and the Load of Atmospheric Mercury to the Arctic

Henrik Skov, Jesper H. Christensen, Michael E. Goodsite, Niels Z. Heidam, Bjarne Jensen, Peter Wahlin, and Gerald Geernaert

Field study, reaction kinetics, and model calculations with a 3-D Eulerian model of the load of atmospheric mercury to the Arctic environment are given.

2383

Climate Effects on Stream Nitrate Concentrations at 16 Forested Catchments in South Central Ontario

Shaun A. Watmough, M. Catherine Eimers, Julian Aherne, and Peter J. Dillon

Climate effects on nitrate concentrations in Ontario headwater streams are studied.

2389

Environmental Fate of Bisphenol A and Its Biological Metabolites in River Water and Their Xeno-estrogenic Activity

Toshinari Suzuki, Yoshio Nakagawa, Ichiro Takano, Kumiko Yaguchi, and Kazuo Yasuda

Monitoring and estrogenic activity of bisphenol A and its biological metabolites in river water are investigated.

Environmental Modeling

■ 2397

Metal Speciation Dynamics and Bioavailability: Bulk Depletion Effects

José P. Pinheiro, Josep Galceran, and Herman P. Van Leeuwen

A mathematical model for bulk depletion effects in trace metal uptake by microorganisms is presented and applied to four relevant practical cases.

2406

Bioaccumulation Potential of Persistent Organic Chemicals in Humans

Gertje Czub and Michael S. McLachlan

A combined multimedia fate and bioaccumulation model suggests that net transfer of chemicals from the environment to humans is largely independent of chemical partitioning properties.

Environmental Measurements Methods

2413

Uncertainty in Particle Number Modal Analysis during Transient Operation of Compressed Natural Gas, Diesel, and Trap-Equipped Diesel Transit Buses

Britt A. Holmén and Yingge Qu

Sampling and analysis issues associated with using ELPI real-time particle number measurements to evaluate particle emissions as a function of vehicle operating mode are evaluated.

2424

Measurement of Contemporary and Fossil Carbon Contents of PM_{2.5} Aerosols: Results from Turtleback Dome, Yosemite National Park

Graham Bench

Methodology to estimate the contributions of fossil fuels and biogenic aerosols to aerosol loading is illustrated using PM_{2.5} aerosols collected at Yosemite National Park.

Remediation and Control Technologies

2428

Adsorption of Arsenic from Water Using Activated Neutralized Red Mud

Hülya Genç-Fuhrman, Jens Christian Tjell, and David McConchie

The potential for using activated seawater-neutralized red mud, a waste from aluminum manufacturing, as an adsorbent for removing arsenic from water is studied.

■ 2435

Removal of Ionic Dyes from Water by Solvent Extraction Using Reverse Micelles

P. Pandit and S. Basu

Ionic dyes are removed from water by solvent extraction using reverse micelles formed by oppositely charged surfactants in solvent.

2443

Enhanced Accumulation of Phosphate by *Lolium multiflorum* Cultivars Grown in Phosphate-Enriched Medium

Nilesh C. Sharma, Shivendra V. Sahi, Jinesh C. Jain, and Kaschandra G. Raghothama

Annual ryegrass can be used as a potential accumulator of phosphate in the phytoremediation strategy for P-contaminated sites.

2449

Landfarm Performance under Arid Conditions.

1. Conceptual Framework

Ramzi F. Hejazi and Tahir Husain

Effects of operating parameters on degradation of oil and grease in oily sludge during landfarming in arid regions based on comprehensive field experiments are discussed.

2457

Landfarm Performance under Arid Conditions.

2. Evaluation of Parameters

Ramzi F. Hejazi and Tahir Husain

An in-depth field investigation on the degradation of various hydrocarbon constituents present in the oily sludge during landfarming under hot and arid conditions is presented.