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Source Apportionment
of **PM_{2.5}** at an
Urban Site in
Seattle, Washington

Policy Analysis

5081

Assessment of Potential Carbon Dioxide Reductions Due to Biomass—Coal Cofiring in the United States

A. L. Robinson, J. S. Rhodes, and D. W. Keith

This paper describes an integrated assessment of the national electricity and carbon mitigation costs from cofiring biomass and coal in the United States.

Characterization of Natural and Affected Environments

5090

Evidence for a Specific Pattern of Polychlorinated Dibenzo-*p*-dioxins and Dibenzofurans in Bivalves

Esteban Abad, Francisca Pérez, José J. Llerena, Josep Caixach, and Josep Rivera

Evidence of an unexpected isomer-specific distribution of PCDDs/PCDFs is reported for bivalves; a comprehensive profile analysis revealed a mixture of both toxic and nontoxic isomers.

5097

Emissions Reductions as a Result of Automobile Improvement

Sajal S. Pokharel, Gary A. Bishop, Donald H. Stedman, and Robert Slott

On-road mass emissions from newer cars and light duty trucks have decreased substantially, accompanied by improved durability.

5102

Mercury Speciation by X-ray Absorption Fine Structure Spectroscopy and Sequential Chemical Extractions: A Comparison of Speciation Methods

Christopher S. Kim, Nicolas S. Bloom, James J. Rytuba, and Gordon E. Brown, Jr.

XAFS spectroscopy and sequential chemical extractions are independently applied and compared to determine the Hg speciation of six natural samples.

5109

Hygroscopic Properties of Two Model Humic-like Substances and Their Mixtures with Inorganics of Atmospheric Importance

Man Nin Chan and Chak K. Chan

This paper studies the hygroscopicity of two model humic-like substances and their mixtures with inorganics of atmospheric importance.

5116

Transport Dynamics in a Sheltered Estuary and Connecting Tidal Straits: SF₆ Tracer Study in New York Harbor

Theodore Caplow, Peter Schlosser, David T. Ho, and Nicholas Santella

Tides carry solutes from third-largest port in the U.S. seaward against the residual circulation, with a residence time of 8 days.

5127

Biogeochemical Processes and Microbial Characteristics across Groundwater—Surface Water Boundaries of the Hanford Reach of the Columbia River

Duane P. Moser, James K. Fredrickson, David R. Geist, Evan V. Arntzen, Aaron D. Peacock, Shu-Mei W. Li, Tina Spadoni, and James P. McKinley

Hyporheic zone sediments from the Columbia River's Hanford Reach are surveyed for potential microbiological and biogeochemical control of contaminant transfer from aquifers to the river.

■ 5135

Source Apportionment of PM_{2.5} at an Urban IMPROVE Site in Seattle, Washington

Naydene N. Maykut, Joellen Lewtas, Eugene Kim, and Timothy V. Larson

Positive matrix factorization and Unmix are used along with EPA's chemical mass balance model to deduce the sources of PM_{2.5} in Seattle, WA.

Environmental Processes

5143

Capacity for Biodegradation of CFCs and HCFCs in a Methane Oxidative Counter-Gradient Laboratory System Simulating Landfill Soil Covers

Charlotte Scheutz and Peter Kjeldsen

The attenuation of methane and four CFCs is investigated in a dynamic methane and oxygen counter-gradient system simulating a landfill soil cover.

5150

Comparative Oxidation and Net Emissions of Methane and Selected Non-Methane Organic Compounds in Landfill Cover Soils

Charlotte Schüetz, Jean Bogner, Jeffrey Chanton, Donald Blake, Muriel Morcet, and Peter Kjeldsen

Landfill soil covers show a significant potential for CH₄ oxidation and co-oxidation of NMOCs.

5159

Acid-Base Properties of Brown Seaweed Biomass Considered As a Donnan Gel. A Model Reflecting Electrostatic Effects and Chemical Heterogeneity

Carlos Rey-Castro, Pablo Lodeiro, Roberto Herrero, and Manuel E. Sastre de Vicente

For three seaweeds, salt type has little influence, ionic strength dependency of proton binding is similar, and average empirical expressions of the Donnan volume are proposed.

5168

"Humic Coverage Index" as a Determining Factor Governing Strain-Specific Hydrocarbon Availability to Contaminant-Degrading Bacteria in Soils

Bill W. Bogan, Wendy R. Sullivan, Kristine H. Cruz, J. Robert Paterek, Peter I. Ravikovitch, and Alexander V. Neimark

Bacterial strains are shown to differ in the amounts of humic materials in soil which support optimal biodegradation of aromatic and aliphatic hydrocarbons.

5175

Virus Inactivation in Aluminum and Polyaluminum Coagulation

Yoshihiko Matsui, Taku Matsushita, Satoru Sakuma, Takahito Gojo, Teppei Mamiya, Hiroshi Suzuoki, and Takano Inoue

Virus enumeration after dissolving of floc particles revealed that virus reduction mediated by inorganic aluminum salts was caused not only by coagulation but also by a virucidal effect.

5181

Leaching Potential of Persistent Soil Fumigant Residues

Mingxin Guo, Scott R. Yates, Wei Zheng, and Sharon K. Papiernik

Leaching potential of persistent fumigant residues in soil was evaluated, and the effect of dissolved organic matter and agrochemical amendment was investigated.

5186

The Relative Effectiveness of pH Control and Heat Treatment for Enhancing Biohydrogen Gas Production

Sang-Eun Oh, Steven Van Ginkel, and Bruce E. Logan

Heat treatment is shown to control methanogenesis, but acetogenesis can contribute to hydrogen losses in batch processes.

■ 5191

Solid-Solution Partitioning of Cd, Cu, Ni, Pb, and Zn in the Organic Horizons of a Forest Soil

Sébastien Sauvé, Sylvie Manna, Marie-Claude Turmel, André G. Roy, and François Courchesne

5197

Sorption of Polycyclic Aromatic Hydrocarbons to Oil Contaminated Sediment: Unresolved Complex?

Michiel T. O. Jonker, Anja J. C. Sinke, Jos M. Brils, and Albert A. Koelmans

Depending on its concentration and weathering state, oil causes either a reduction or an extreme increase in sorption of PAHs to sediment.

5204

Accumulation of Copper and Zinc in Periphyton in Response to Dynamic Variations of Metal Speciation in Freshwater

Sébastien Meylan, Renata Behra, and Laura Sigg

Metal accumulation by algae in natural freshwater appears to be controlled by free Zn ion concentration and by a labile form of Cu.

5213

Anaerobic Oxidation of Crude Oil Hydrocarbons by the Resident Microorganisms of a Contaminated Anoxic Aquifer

G. Todd Townsend, Roger C. Prince, and Joseph M. Suflita

Two crude oils that varied in alkane content were found susceptible to anaerobic biodegradation revealing unrecognized metabolic potential including the conversion of many hydrocarbon constituents to methane.

5219

Green Rust and Iron Oxide Formation Influences Metolachlor Dechlorination during Zerovalent Iron Treatment

Tunlawit Satapanajaru, Patrick J. Shea, Steve D. Comfort, and Yul Roh

The appearance of green rust during treatment with zerovalent iron coincides with conditions favorable for metolachlor destruction and facilitates dechlorination by producing magnetite and providing Fe(II).

Environmental Modeling

5228

Application of QSTRs in the Selection of a Surrogate Toxicity Value for a Chemical of Concern

C. J. Moudgal, R. Venkatapathy, H. Choudhury, R. M. Bruce, and J. C. Lipscomb

This paper outlines a process for selecting surrogates for chemicals that lack experimental toxicity data using quantitative structure toxicity relationship models.

5236

Regional Modeling of the Atmospheric Fate and Transport of Benzene and Diesel Particles

Christian Seigneur, Betty Pun, Kristen Lohman, and Shiang-Yuh Wu

The Community Multiscale Air Quality (CMAQ) model is modified to simulate the atmospheric fate and transport of benzene and diesel particles for a 5-day period over the eastern United States.

Environmental Measurements Methods

5247

Europium Uptake and Partitioning in Oat (*Avena sativa*) Roots as Studied by Laser-Induced Fluorescence Spectroscopy and Confocal Microscopy Profiling Technique

Robert J. Fellows, Zheming Wang, and Calvin C. Ainsworth

Time-resolved Eu^{3+} fluorescence spectroscopy and confocal fluorescence profiling techniques in vivo, real-time study of metal accumulation by an intact plant root.

5254

Use of Multiwavelength Transmission Spectroscopy for the Characterization of *Cryptosporidium parvum* Oocysts: Quantitative Interpretation

Michael R. Callahan, Joan B. Rose, and Luis Garcia-Rubio

A model for the quantitative interpretation of *Cryptosporidium parvum* oocyst spectral patterns based upon novel light scattering and absorption models is described.

5262

As, Hg, and Se Flue Gas Sampling in a Coal-Fired Power Plant and Their Fate during Coal Combustion

José R. Otero-Rey, José M. López-Vilariño, Jorge Moreda-Piñeiro, Elia Alonso-Rodríguez, Soledad Muniategui-Lorenzo, Purificación López-Mahía, and Darío Prada-Rodríguez

As, Se, and Hg behavior in a coal-fired power plant is studied, and the ASTM Ontario Hydro Method Sampling Train for Hg speciation in flue gas is tested for As and Se sampling.

Correspondence

5268

Comment on "Evaluation of the Diffusive Gradient in a Thin Film Technique for Monitoring Trace Metal Concentrations in Estuarine Waters"

F. A. DiGiano

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

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