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ENVIRONMENTAL Science & Technology

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Life-Cycle Emissions from PHOTOVOLTAICS

Risks of Nanotechnology
Remain Uncertain

Why Large-Scale Afforestation
in China Has Failed To
Stop Desertification

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THE AMERICAN
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CRITICAL REVIEW

■ 1833

Membrane-Aerated Biofilms for High Rate Biotreatment: Performance Appraisal, Engineering Principles, Scale-up, and Development Requirements

Eoin Syron and Eoin Casey*

This is the first comprehensive critical review of the membrane-aerated biofilm reactor, an emerging technology for high rate aerobic wastewater treatment.

■ 1845

Formation of Pesticide Nonextractable (Bound) Residues in Soil: Magnitude, Controlling Factors and Reversibility

Enrique Barriuso,* Pierre Benoit, and Igor G. Dubus

All pesticides form NER at different extents, and available data in the literature are reviewed to point out the overall factors involved in NER formation in soils.

POLICY ANALYSIS

■ 1855

Charting a Path for Innovative Toilet Technology Using Multicriteria Decision Analysis

Mark E. Borsuk,* Max Maurer, Judit Lienert, and Tove A. Larsen

A multicriteria decision analysis of urine separating toilets shows that they should be adopted in a new mixed-use community only if stakeholders are especially precautionary toward environmental protection.

CHARACTERIZATION OF NATURAL AND AFFECTED ENVIRONMENTS

■ 1863

Bioaccumulation of Pharmaceuticals and Other Anthropogenic Waste Indicators in Earthworms from Agricultural Soil Amended With Biosolid or Swine Manure

Chad A. Kinney,* Edward T. Furlong, Dana W. Kolpin, Mark R. Burkhardt, Steven D. Zaugg, Stephen L. Werner, Joseph P. Bossio, and Mark J. Benotti

Accumulation of a variety of organic anthropogenic waste indicator compounds by earthworms is investigated in biosolid and swine manure amended soils.

■ 1871

Near-Field Commercial Aircraft Contribution to Nitrogen Oxides by Engine, Aircraft Type, and Airline by Individual Plume Sampling

David C. Carslaw,* Karl Ropkins, Duncan Laxen, Stephen Moorcroft, Ben Marner, and Martin L. Williams

Individual aircraft plumes are sampled to draw inferences concerning aircraft emissions of nitrogen oxides and their dependence on aircraft operational factors.

■ 1877

Commercial Aircraft Engine Emissions Characterization of in-Use Aircraft at Hartsfield-Jackson Atlanta International Airport

Scott C. Herndon,* John T. Jayne, Prem Lobo, Timothy B. Onasch, Gregg Fleming, Donald E. Hagen, Philip D. Whitefield, and Richard C. Miake-Lye

Commercial aircraft engine emissions characterization of in-use aircraft at Hartsfield-Jackson Atlanta International Airport.

■ 1884

Speciation and Chemical Evolution of Nitrogen Oxides in Aircraft Exhaust near Airports

Ezra C. Wood,* Scott C. Herndon, Michael T. Timko, Paul E. Yelvington, and Richard C. Miake-Lye

NO_x emissions from commercial aircraft consist primarily of NO₂ at low power.

■ 1892

Occurrence, Phase Distribution, and Mass Loadings of Benzothiazoles in Riverine Runoff of the Pearl River Delta, China

Hong-Gang Ni, Feng-Hui Lu, Xian-Lin Luo, Hui-Yu Tian, and Eddy Y. Zeng*

Benzothiazoles in riverine runoff in the Pearl River Delta, China, are examined, and their global inputs from tire-wear particles and scrap tires are assessed.

1898

Occurrence of Organophosphorus Flame Retardant and Plasticizers in Three Volcanic Lakes of Central Italy

Alessandro Bacaloni, Francesca Cucci, Chiara Guarino, Manuela Nazzari, Roberto Samperi, and Aldo Laganà*

Nonpesticide organophosphorous compounds are present in the range of 0–950 ng L⁻¹, depending on anthropic impact, in small volcanic lakes receiving neither industrial nor domestic effluents.

■ 1904

Occurrence and Profiles of Chlorinated and Brominated Polycyclic Aromatic Hydrocarbons in Waste Incinerators

Yuichi Horii, Gon Ok, Takeshi Ohura, and Kurunthachalam Kannan*

Chlorinated and brominated polycyclic aromatic hydrocarbons, measured in waste incinerator samples, are found to have a dioxin-like toxicity contribution similar to that for dioxins.

ENVIRONMENTAL PROCESSES

■ 1910

Influence of Nitrate on Microbial Reduction of Pertechnetate

Xiangzhen Li and Lee R. Krumholz*

An investigation of the effect of nitrate, present as a cocontaminant, on the in-situ bioremediation of technetium.

■ 1916

Role of the Air–Water Interface in the Retention of TiO₂ Nanoparticles in Porous Media during Primary Drainage

Lixia Chen, David A. Sabatini, and Tohren C. G. Kibbey*

Experiments examine the effects of saturation and drainage rate on the dynamic transport of TiO₂ nanoparticles in unsaturated porous media.

■ 1922

Adsorption Thermodynamics of p-Arsanilic Acid on Iron (Oxyhydr)Oxides: In-Situ ATR-FTIR Studies

Sarah Depalma, Scott Cowen, Tuan Hoang, and Hind A. Al-Abadleh*

Binding of organoarsenical p-arsanilic acid to iron (oxyhydr)oxides is investigated using in situ ATR-FTIR for adsorption thermodynamics and structure of surface complexes.