Environmental Science Processes & Impacts

rsc.li/espi

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2050-7887 CODEN ESPICZ 25(3) 329-696 (2023)

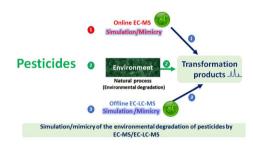


See Trevor C. VandenBoer et al., pp. 389-404. Image reproduced by permission of Trevor C. VandenBoer from Environ. Sci.: Processes Impacts, 2023, 25, 389.

FRONTIER

Electrochemistry coupled with mass spectrometry for the prediction of the environmental fate and elucidation of the degradation mechanisms of pesticides: current status and future prospects

Ranil Clément Tonleu Temgoua,* Ignas Kenfack Tonlé and Mohammed Boujtita

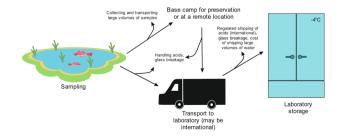


Highlights

CRITICAL REVIEWS

The present and potential future of aqueous mercury preservation: a review

David C. P. King, Michael J. Watts, Elliott M. Hamilton,* Robert Mortimer, David P. A. Kilgour and Marcello Di Bonito



Editorial Staff

Executive Editor

Neil Scriven

Deputy Editor

Grace Thoburn

Development Editor

Nour Tanbouza

Editorial Production Manager

Claire Darby

Publishing Editors

Emma Carlisle, Hannah Hamilton, Irene Sanchez Molina Santos, Michael Spencelayh, Callum Woof, Lauren Yarrow-Wright

Editorial Assistant

Kate Bandoo

Publishing Assistant

Linda Warncke

Publisher

Sam Keltie

For queries about submitted papers please contact Claire Darby, Editorial Production Manager, in the first instance. E-mail: espi@rsc.org

For pre-submission queries please contact Neil Scriven, Executive Editor.

Environmental Science: Processes & Impacts

(electronic: ISSN 2050-7895) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry,

Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK

Tel +44 (0)1223 432398; E-mail orders@rsc.org

2023 Annual electronic subscription price: £1839 US\$3301. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing

to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.ore/ip

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office:
Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017; E-mail **advertising@rsc.org**

For marketing opportunities relating to this journal, contact marketing@rsc.org

Environmental ScienceProcesses & Impacts

rsc.li/espi

Environmental Science: Processes & Impacts is a multidisciplinary journal for the environmental chemical sciences, publishing high quality papers in areas including the chemistry of the air, water, soil and sediment.

Editorial Board

Editor-in-Chief

Kristopher McNeill, ETH Zürich, Switzerland

Associate Editors

Marianne Glasius, Aarhus University, Denmark Heileen Hsu-Kim, Duke University, USA Qian Liu, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, China

Matthew MacLeod, Stockholm University, Sweden

Paul Tratnyek, Oregon Health & Science University, USA

Members

Katye Altieri, University of Cape Town, South Africa

Ludmilla Aristilde, Northwestern University, USA

Amila de Silva, Environment and Climate Change Canada, Canada Beate Escher, Helmholtz Centre for Environmental Research, Germany Mingliang Fang, Nanyang Technological University, Singapore

Delphine Farmer, Colorado State University, USA Weihua Song, Fudan University, China Lenny Winkel,

Swiss Federal Institute of Aquatic Science and Technology, Eawag, Switzerland Cora Young, York University, Canada

Advisory Board

Urs Baltensperger, Paul Scherrer Institute, Switzerland

Alexandria Boehm, Stanford University, USA Richard Brown, National Physical Laboratory, UK

Junji Cao, Institute of Earth Environment, CAS, China

Kathrin Fenner, Swiss Federal Institute of Aquatic Science and Technology, Eawag, Switzerland

Tamara Galloway, University of Exeter, UK Philip Gschwend, Massachusetts Institute of Technology, USA

Liang-Hong Guo, China Jiliang University, China

Colleen Hansel, Woods Hole Oceanographic Institution, USA Hans Christian Bruun Hansen, University of Copenhagen, Denmark

Stuart Harrad, University of Birmingham, UK Jianying Hu, Peking University, China Young-Shin Jun, Washington University in St. Louis, USA

Andreas Kappler, University of Tübingen, Germany

Karen Kidd, McMaster University, Canada Edward Kolodziej, University of Washington, USA

Ruben Kretzschmar, ETH Zürich, Switzerland Linsey Marr, Virginia Polytechnic Institute and State University, USA

Derek Muir, Environment & Climate Change Canada, Canada

Kara Nelson, University of California, Berkeley,

USA

Jasquelin Peña, University of California, Davis, USA Noelle Selin. Massachusetts Institute of

Technology, USA

Susan Solomon, Massachusetts Institute of Technology, USA

Elsie Sunderland, Harvard University, USA Sachchida Nand Tripathi, Indian Institute of Technology Kanpur, India

David Waite, University of New South Wales, Australia

Frank Wania, University of Toronto at Scarborough, Canada

Guang-Guo Ying, South China Normal University, China

Information for Authors

Full details on how to submit material for publication in Environmental Science: Processes & Impacts are given in the Instructions for Authors (available from http://www.rsc.org/authors). Submissions should be made via the journal's homepage: rsc.li/espi

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023. Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

Registered charity number: 207890

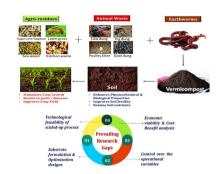


CRITICAL REVIEWS

364

Sustainable organic waste management using vermicomposting: a critical review on the prevailing research gaps and opportunities

Arunachalam Thirunavukkarasu, Raja Sivashankar, Rajarathinam Nithya,* Arunachalam Bose Sathya, Venkatachalam Priyadharshini, Balakrishnan Prem Kumar, Murugan Muthuveni and Sakthishobana Krishnamoorthy

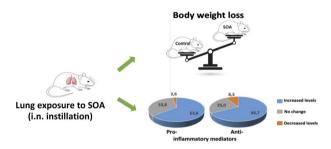


COMMUNICATION

382

Weight loss and abnormal lung inflammation in mice chronically exposed to secondary organic aerosols

Tanguy Déméautis, Alexandra Bouyssi, Alain Geloen, Christian George, Jean Menotti, Olivier Glehen, Gilles Devouassoux and Abderrazzak Bentaher*



Abnormal lung inflammation

PAPERS

389

Emerging investigator series: an instrument to measure and speciate the total reactive nitrogen budget indoors: description and field measurements

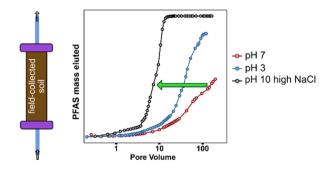
Leigh R. Crilley, Melodie Lao, Leyla Salehpoor and Trevor C. VandenBoer*



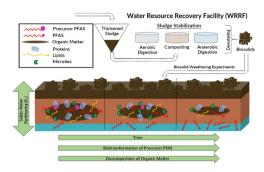
405

Effect of geochemical conditions on PFAS release from AFFF-impacted saturated soil columns

Anastasia Nickerson, Andrew C. Maizel, Charles E. Schaefer, James F. Ranville and Christopher P. Higgins*



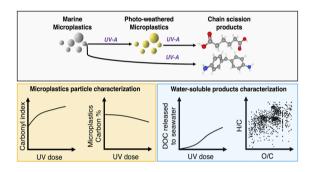
415



Influence of microbial weathering on the partitioning of per- and polyfluoroalkyl substances (PFAS) in biosolids

Asa J. Lewis,* Farshad Ebrahimi, Erica R. McKenzie, Rominder Suri and Christopher M. Sales

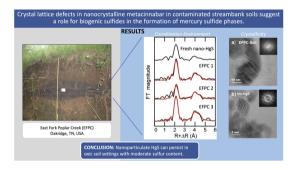
432



Photochemical weathering of polyurethane microplastics produced complex and dynamic mixtures of dissolved organic chemicals

Vittorio Albergamo,* Wendel Wohlleben and Desirée L. Plata

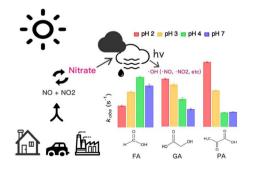
445



Crystal lattice defects in nanocrystalline metacinnabar in contaminated streambank soils suggest a role for biogenic sulfides in the formation of mercury sulfide phases

Faye Koenigsmark, Michelle Chiu, Nelson Rivera, Alexander Johs, Jeremy Eskelsen, Donovan Leonard, Boakai K. Robertson, Anna Szynkiewicz, Christopher Derolph, Linduo Zhao, Baohua Gu, Heileen Hsu-Kim and Eric M. Pierce*

461



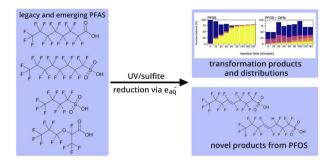
Kinetics of the nitrate-mediated photooxidation of monocarboxylic acids in the aqueous phase

Yuting Lyu, Jany Ting Chun Chow and Theodora Nah*

472

Nontarget analysis and fluorine atom balances of transformation products from UV/sulfite degradation of perfluoroalkyl contaminants

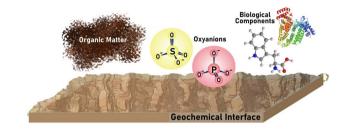
Bailey B. Bowers, Zimo Lou, Jiang Xu, Amila O. De Silva, Xinhua Xu, Gregory V. Lowry and Ryan C. Sullivan*



484

Analysis of micro- and nanoscale heterogeneities within environmentally relevant thin films containing biological components, oxyanions and minerals using AFM-PTIR spectroscopy

Deborah Kim and Vicki H. Grassian*



496

Seasonal and latitudinal variability in the atmospheric concentrations of cyclic volatile methyl siloxanes in the Northern Hemisphere

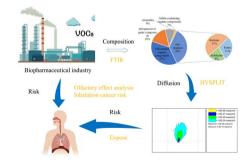
Frank Wania, Nicholas A. Warner, Michael S. McLachlan, Jeremy Durham, Merete Miøen, Ying Duan Lei and Shihe Xu*



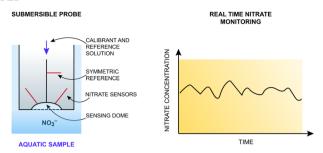
507

Generation characteristics and spreading risk of VOCs released from a biological fermentation pharmaceutical factory

Yanjie Wang, Huiling Song, Lin Li, Jiawei Ma and Fangfang Yu*



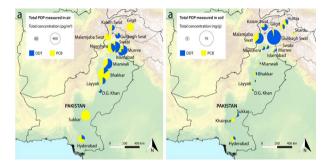
519



A submersible probe with in-line calibration and a symmetrical reference element for continuous direct nitrate concentration measurements

Tara Forrest, Thomas Cherubini, Stéphane Jeanneret, Elena Zdrachek, Polyxeni Damala and Eric Bakker*

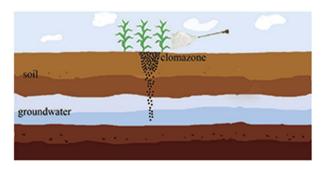
531



Gaseous and soil OCPs and PCBs along the Indus River, Pakistan: spatial patterns and air-soil gradients

Muhammad Sohail,* Syed Ali Musstjab Akber Shah Egani,* Shazia Ilyas, Habib Bokhari, Nadeem Ali, Joel E. Podgorski, Shafi Muhammad, Dave Adelman and Rainer Lohmann

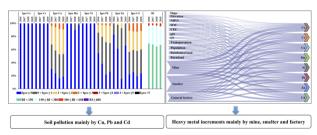
542



Characterization of the clomazone sorption process in four agricultural soils using different kinetic models

Rada Đurović-Pejčev,* Svjetlana Radmanović, Zorica P. Tomić, Lazar Kaluđerović and Tijana Đorđević

554



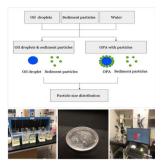
Spatiotemporal patterns of soil heavy metal pollution risk and driving forces of increment in a typical industrialized region in central China

Xue Yang and Yong Yang*

566

Formation of oil-particle aggregates with motor oil and kaolinite clay in cold and warm freshwater

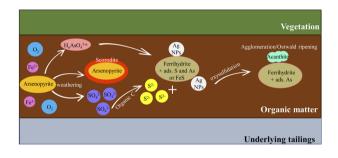
Abdulrhman Fahmi Alali, Shu Wang, Zhenduo Zhu* and Joseph Atkinson



577

Nanoscale characterization of the sequestration and transformation of silver and arsenic in soil organic matter using atom probe tomography and transmission electron microscopy

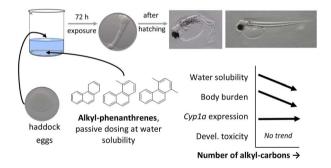
Mozhgan Akbari Alavijeh,* Michael Schindler, Mark G. Wirth, Odeta Qafoku, Libor Kovarik and Daniel E. Perea



594

Alkyl-phenanthrenes in early life stage fish: differential toxicity in Atlantic haddock (Melanogrammus aeglefinus) embryos

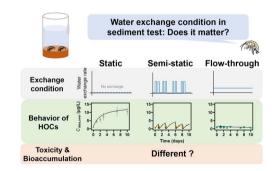
Carey E. Donald,* Charlotte L. Nakken, Elin Sørhus, Prescilla Perrichon, Kåre B. Jørgensen, Hege K. Bjelland, Christine Stølen, Sindhu Kancherla, Philipp Mayer and Sonnich Meier



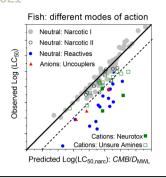
609

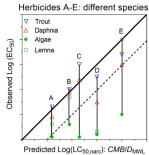
Influence of water exchange rates on toxicity and bioaccumulation of hydrophobic organic chemicals in sediment toxicity tests

Kyoshiro Hiki,* Fabian Christoph Fischer,* Takahiro Nishimori, Satoshi Endo, Haruna Watanabe and Hiroshi Yamamoto



621

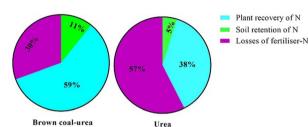




Using membrane-water partition coefficients in a critical membrane burden approach to aid the identification of neutral and ionizable chemicals that induce acute toxicity below narcosis levels

Steven T. J. Droge,* Geoff Hodges, Mark Bonnell, Steve Gutsell, Jayne Roberts, Alexandre Teixeira and Elin L. Barrett

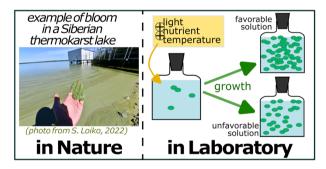
648



Fate and recovery of nitrogen applied as slow release brown coal-urea in field microcosms: 15N tracer study

Biplob K. Saha,* Michael T. Rose, Lukas Van Zwieten, Vanessa N. L. Wong, Terry J. Rose and Antonio F. Patti

659

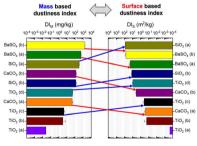


Laboratory growth capacity of an invasive cyanobacterium (Microcystis aeruginosa) on organic substrates from surface waters of permafrost peatlands

Dahédrey Payandi-Rolland,* Liudmila S. Shirokova, Julien Larieux, Pascale Bénézeth and Oleg S. Pokrovsky

670





Towards a surface metric to measure the dustiness of nanomaterial powders

Claire Dazon,* Sébastien Bau, Raphaël Payet, Vanessa Fierro and Olivier Witschger

680

Comparison of nitrate formation mechanisms from free amino acids and amines during ozonation: a computational study

Shuning Yin, Qunfang Shen, Yong Dong Liu* and Rugang Zhong

