

# Environmental Science: Advances

rsc.li/esadvances

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 2754-7000 CODEN ESANEB 2(4) 545–676 (2023)



Cover  
Image credit: © Leonardo Laschera/EyeEm/Getty Images.

## PERSPECTIVE

551

### People, plastic, and behaviour change – a comment on drivers of plastic pollution, barriers to change and targeted behaviour change interventions

Anna MacDonald, Deonie Allen,\* Lynn Williams, Paul Flowers and Tony R. Walker

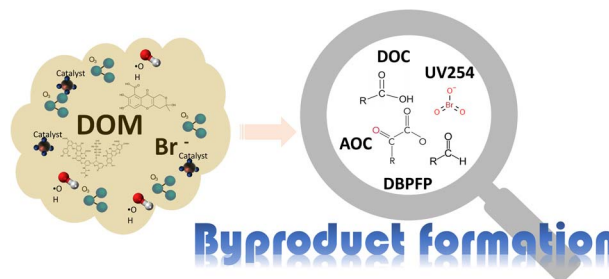


## TUTORIAL REVIEW

558

### Byproduct formation in heterogeneous catalytic ozonation processes

Tingting Wu\*



## Editorial Staff

### Executive Editor

Emma Eley

### Deputy Editor

Jon Ferrier

### Editorial Production Manager

Sarah Whitbread

### Assistant Editors

Aphra Murray, Jamie Purcell, Alexander John, Emily Ellison, Jack Pitchers

### Editorial Assistant

Alex Holiday

### Publishing Assistant

Lee Colwill

### Publisher

Neil Hammond

For queries about submitted papers please contact Sarah Whitbread, Editorial Production Manager in the first instance. E-mail: [esadvances@rsc.org](mailto:esadvances@rsc.org)

For pre-submission queries please contact

Emma Eley, Executive Editor.

E-mail: [esadvances-rsc@rsc.org](mailto:esadvances-rsc@rsc.org)

Environmental Science: Advances (electronic: ISSN 2754-7000) is published 6 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

Environmental Science: Advances is a Gold Open Access journal and all articles are free to read.

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](mailto:advertising@rsc.org)

For marketing opportunities relating to this journal, contact [marketing@rsc.org](mailto:marketing@rsc.org)

# Environmental Science: Advances

[rsc.li/esadvances](http://rsc.li/esadvances)

Our existing environmental science journals all have chemistry at their core. *Environmental Science: Advances* will span not only chemistry, but research from any discipline related to the environmental sciences.

We welcome research from any discipline that will contribute to the understanding of the environment, and to the advancement of several UN Sustainable Development Goals – original thinking to take on the world's biggest challenges.

## Editorial Board

### Editor-in-Chief

Zongwei Cai, Hong Kong Baptist University, Hong Kong

Kevin Jones, Lancaster University, UK

Célia M. Manaia, Universidade Católica Portuguesa, Portugal

### Associate Editors

Ru-Jin Huang, Institute of Earth Environment, Chinese Academy of Sciences, China

Joe Ryan, University of Colorado Boulder, USA

Liwu Zhang, Fudan University, China

Pernilla Bohlin-Nizzetto, Norwegian Institute for Air Research, Norway

David Weissbrodt, Norwegian University of Science and Technology, Norway

### Members

Silvia Lacorte seult, IDAEA-CSIC, Spain

## Advisory Board

Damià Barceló, Institute of Environmental Assessment and Water Research, Spain  
Zhi-Feng Chen, Guangdong University of Technology, China  
Jiping Chen, Dalian Institute of Chemical Physics, China  
Chungheng Chen, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China  
Maofa Ge, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China  
Tom Harner, Environment and Climate Change Canada, Canada  
Rong Ji, Nanjing University, China

Ramanan Laxminarayan, One Health Trust, Washington D.C., United States  
Yongjie Li, University of Macau, Taipa, Macao  
Hemi Luan, Southern University of Science and Technology, China  
Jurgita Ovadnevaite, National University of Ireland Galway, Ireland  
Andreas Schäffer, Institute for Environmental Research, RWTH Aachen University, Germany  
Philippe Schmitt-Kopplin, Helmholtz Zentrum München, Germany

Dörthe Tetzlaff, Humboldt University of Berlin and IGB Leibniz Institute of Freshwater Ecology and Inland Fisheries  
Mark van Loosdrecht, Technische Universiteit Delft, Netherlands  
Meizhen Wang, Zhejiang Gongshang University, China  
Zhe Wang, Hong Kong University of Science and Technology, Hong Kong, China  
Dengsong Zhang, Shanghai University, China  
Xuan Zhang, University of California, Merced, USA

## Information for Authors

Full details on how to submit material for publication in *Environmental Science: Advances* 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/esadvances](http://rsc.li/esadvances)

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

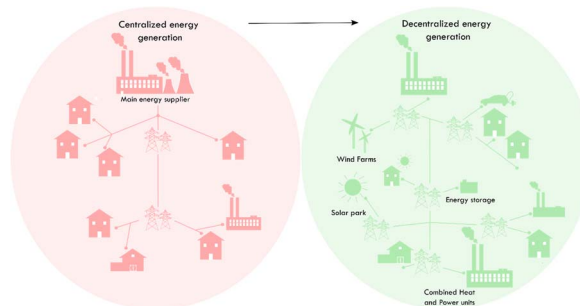


## CRITICAL REVIEWS

570

## Sustainable energy technologies for the Global South: challenges and solutions toward achieving SDG 7

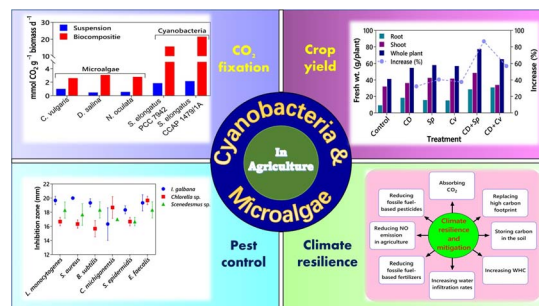
Andrew Ng Kay Lup,\* Vikram Soni, Benjamin Keenan, Jaewon Son, Mohammad Ramezani Taghartapeh, Marcelo Menezes Morato, Yalinu Poya and Rubén M. Montañés



586

## Potential of microalgae and cyanobacteria to improve soil health and agricultural productivity: a critical view

Balasubramanian Ramakrishnan, Naga Raju Maddela, Kadiyala Venkateswarlu and Mallavarapu Megharaj\*

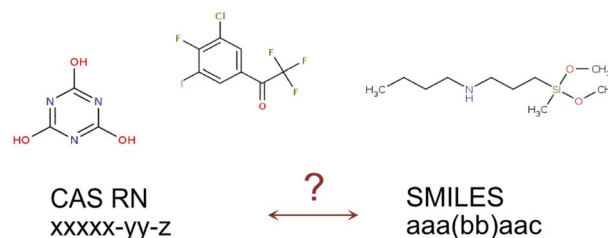


## PAPERS

612

## Getting the SMILES right: identifying inconsistent chemical identities in the ECHA database, PubChem and the CompTox Chemicals Dashboard

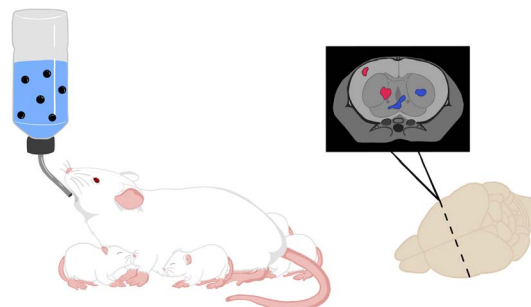
Juliane Glüge,\* Kristopher McNeill and Martin Scherlinger



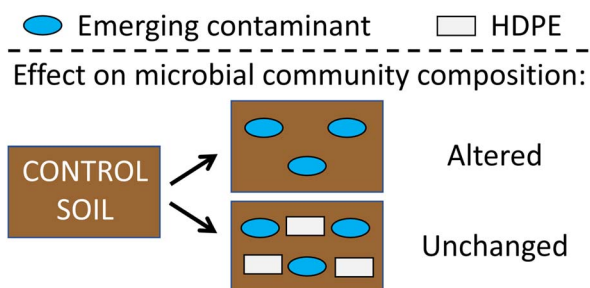
622

## Maternal exposure to polystyrene nanoplastics impacts developmental milestones and brain structure in mouse offspring

Nikita E. Harvey, Grace V. Mercer, Darcie Stapleton, Katherine L. Steeves, Jenna Hanrahan, Megan Cui, Zahra Aghaei, Shoshana Spring, Paul A. Helm, André J. Simpson, Myrna J. Simpson, Christopher K. Macgowan, Ahmet A. Baschat, John C. Kingdom, John G. Sled, Karl J. Jobst and Lindsay S. Cahill\*



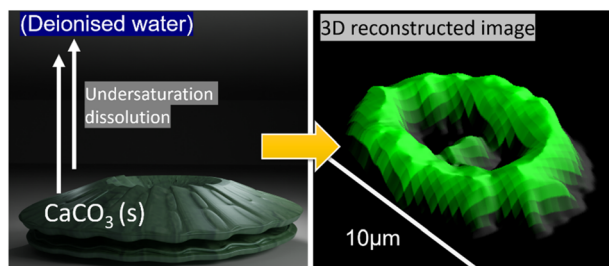
629



### Effect of emerging contaminants on soil microbial community composition, soil enzyme activity, and strawberry plant growth in polyethylene microplastic-containing soils

Shawninder Chahal, Peiying Wang, Vinicius Bueno, Hemanshu Anand, Stéphane Bayen,\* Subhasis Ghoshal, Valérie Gravel and Nathalie Tufenkji\*

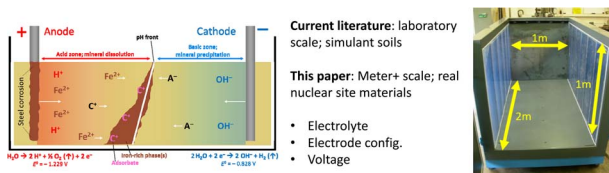
645



### A simple microscopy approach quantifies biomineralized CO<sub>2</sub> in *Coccolithus braarudii* – a calcifying marine phytoplankton

Toby Morton-Collings, Minjun Yang, Christopher Batchelor-McAuley, Samuel Barton, Rosalind E. M. Rickaby, Heather A. Bouman and Richard G. Compton\*

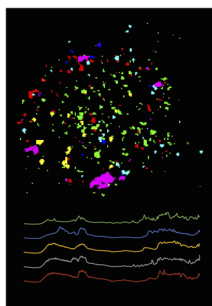
652



### Electrokinetic generation of iron-rich barriers in soils: realising the potential for nuclear site management and decommissioning

Jamie M. Purkis, Frances Burrell, James R. Brydie, James Graham, Laurence Hopkinson and Andrew B. Cundy\*

663



### Development of a rapid detection protocol for microplastics using reflectance-FTIR spectroscopic imaging and multivariate classification

Meg Willans, Elkia Szczecinski, Claire Roocke, Sophie Williams, Sunita Timalsina, Jitraporn Vongsvivut, Jennifer McIlwain, Gita Naderi, Kathryn L. Linge and Mark J. Hackett\*

