

# 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(6) 831–924 (2023)



### Cover

See Si-Si Liu, Chang-Er Chen *et al.*, pp. 837–847. Image reproduced by permission of Si-Si Liu from *Environ. Sci.: Adv.*, 2023, 2, 837.

## PAPERS

837

### Development of diffusive gradients in thin-films with mixed binding gels for *in situ* monitoring of artificial sweeteners in waters

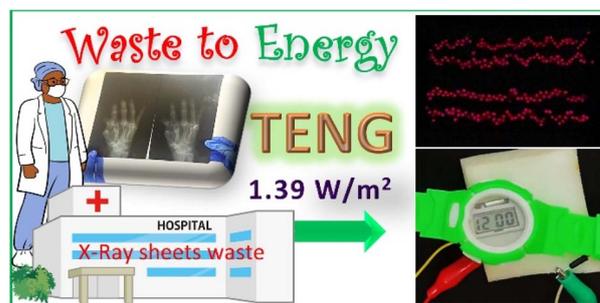
Hussain Ijaz, Jin-Xin Zi, Si-Si Liu,\* Qi-Si Cai, Sheng-Ming Cheng, Zong-Xi Zhao, Guang-Guo Ying, Andy J. Sweetman and Chang-Er Chen\*



848

### A medical waste X-ray film based triboelectric nanogenerator for self-powered devices, sensors, and smart buildings

M. Navaneeth, Supraja Potu, Anjaly Babu, Rakesh Kumar Rajaboina,\* Uday Kumar K, Haranath Divi, Prakash Kodali and Balaji K.



**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

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

Chun Cheng 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.

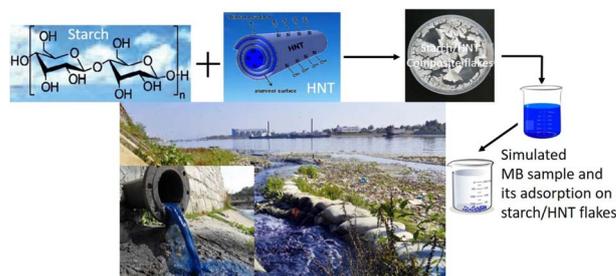
Registered charity number: 207890



861

### A starch based sustainable bio-hybrid composite for surface assimilation of methylene blue: preparation, characterization, and adsorption study

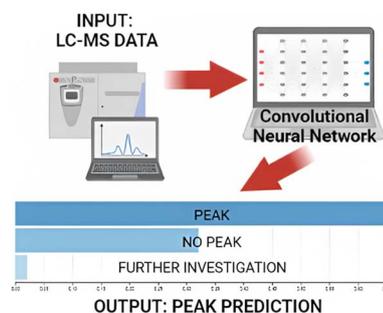
Anargha P. Nambiar, Rahul Pillai, Mallika Sanyal, Yugesh Vadikkeetil and Pranav S. Shrivastav\*



877

### Application of deep learning to support peak picking during non-target high resolution mass spectrometry workflows in environmental research

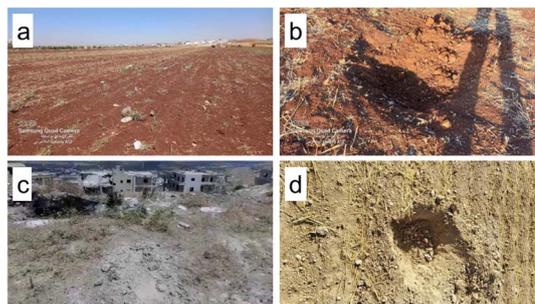
Kate Mottershead and Thomas H. Miller\*



886

### A baseline survey of potentially toxic elements in the soil of north-west Syria following a decade of conflict

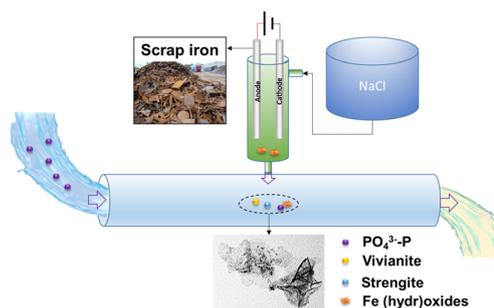
Miassar Alhasan, Abdulkarim Lakmes, Mohammad Gazy Alobaidy, Safwan AlHaeek, Muhammed Assaf, Lorna Dawson, Duncan Pirrie, Ziad Abdeldayem and Jonathan Bridge\*

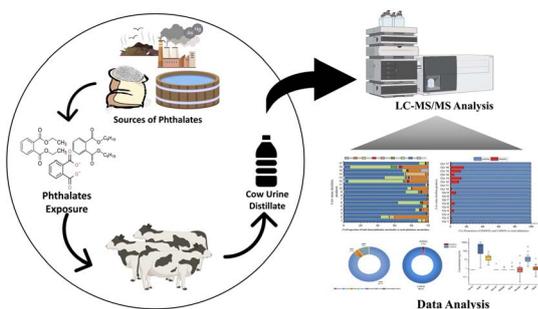


898

### Phosphate removal by *ex situ* generated Fe (hydr) oxides from scrap iron electrocoagulation: the critical role of coprecipitation

Shiwei Xie, Zhengkang Bai, Wei Shao, Chen Wang, Jianglong Qin, Ze Liu and Peng Liao\*





## Investigating the urinary concentrations and distribution of phthalate metabolites in cow urine distillate in India

Sachin B. Jorvekar, Jaya Ajay Singh, Manthan Sharma, Gayatri Narkhede, Rahul Moriya, Dhanashri Pimpare and Roshan M. Borkar\*

M = molecule  
 $S_j$  = SMILES fragment  
 $CW$  = correlation weight

$$\begin{pmatrix} M_1 \\ M_2 \\ M_3 \\ \vdots \\ M_m \end{pmatrix} \rightarrow \begin{pmatrix} S_{11} & S_{12} & \dots & S_{N_1} \\ S_{21} & S_{22} & \dots & S_{N_2} \\ S_{31} & S_{32} & \dots & S_{N_3} \\ \vdots & \vdots & \dots & \vdots \\ S_{m1} & S_{m2} & \dots & S_{N_m} \end{pmatrix} \xrightarrow{\text{Monte Carlo method}} \begin{pmatrix} CW(S_{11}) & CW(S_{12}) & \dots & CW(S_{N_1}) \\ CW(S_{21}) & CW(S_{22}) & \dots & CW(S_{N_2}) \\ CW(S_{31}) & CW(S_{32}) & \dots & CW(S_{N_3}) \\ \vdots & \vdots & \dots & \vdots \\ CW(S_{m1}) & CW(S_{m2}) & \dots & CW(S_{N_m}) \end{pmatrix}$$

**Henry's law constant** =  $C_0 + C_1 \times \sum CW(S_{ij})$

## Does the accounting of the local symmetry fragments in SMILES improve the predictive potential of the QSPR-model for Henry's law constants?

Andrey A. Toropov, Alla P. Toropova,\*  
 Alessandra Roncaglioni and Emilio Benfenati

