

# RSC Sustainability

rsc.li/rscsus

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 2753-8125 CODEN RSSUAN 3(12) 5397–5680 (2025)



### Cover

See Helena Rapp-Wright *et al.*, pp. 5470–5485. Image reproduced by permission of Helena Rapp-Wright from *RSC Sustainability*, 2025, 3, 5470.



### Inside cover

See Bridget Tang *et al.*, pp. 5486–5494. Image reproduced by permission of Bridget Tang, Katie Chong and Robert Evans from *RSC Sustainability*, 2025, 3, 5486.

## EDITORIALS

5406

### Electrocatalysis for energy conversion reactions

Zhenyu Sun



5408

### Sustainable chemistry without borders: Highlights from an inaugural conference held at St Andrews in June 2025

Amit Kumar\* and David J. Cole-Hamilton\*



**GOLD  
OPEN  
ACCESS**

# EES Solar

**Exceptional research on solar  
energy and photovoltaics**

Part of the EES family

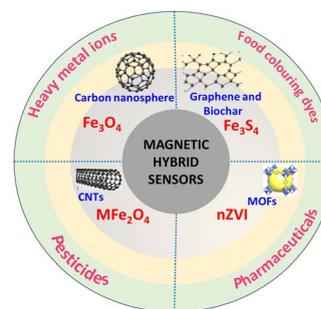
**Join  
in** | Publish with us  
[rsc.li/EESSolar](https://rsc.li/EESSolar)

## CRITICAL REVIEWS

5410

**Magnetically recoverable hybrid materials for electrochemical monitoring of hazardous contaminants: a review**

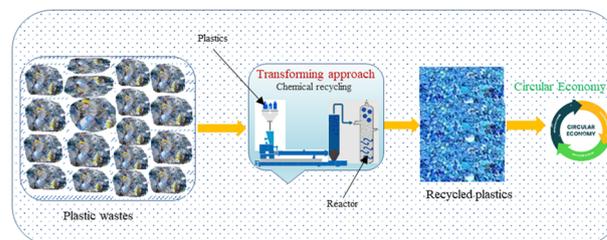
Aaliya Qureashi, Arshid Bashir, Irfan Nazir, Firdous Ahmad Ganaie, Kaniz Fatima, Ziaul Haq, Lateef Ahmad Malik, Abdullah Yahya Abdullah Alzahrani and Altaf Hussain Pandith\*



5433

**Innovative recycling strategies for non-recycled plastics: advancing the circular economy for a sustainable future**

Rajesh Kumar Srivastava, Prakash Kumar Sarangi,\* Akhilesh Kumar Singh, Ashna Parveen, Uttam Kumar Sahoo, Vinod V. T. Padil, Kasim Sakran Abass, Khurmatbek Jumaniyozov, Choo Wou Onn and Tonni Agustiono Kurniawan\*

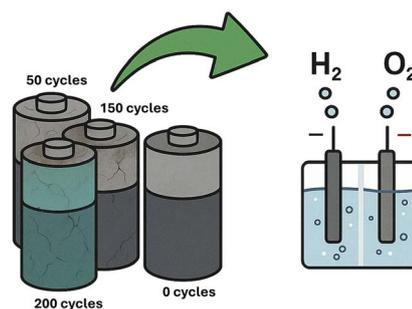


## COMMUNICATIONS

5459

**Recovering spent lithium nickel manganese cobalt (NMC) oxide cathodes from Li ion batteries for use as oxygen evolution reaction electrocatalysts**

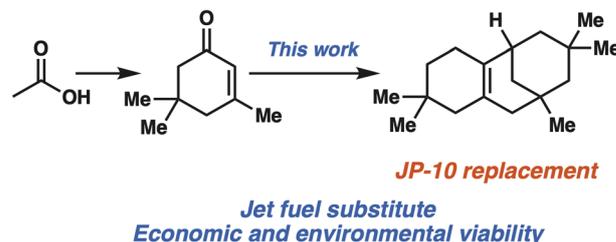
Arshdeep Kaur, Hongxia Wang, Michael R. Horn, Jessica Crawford and Anthony P. O'Mullane\*



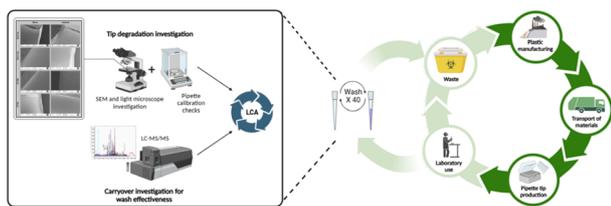
5464

**Development of a bridged structure compound from isophorone as a JP-10 alternative**

Han Byeol Kim, Hyerim Kim, Hwayeon Jeon, Pratip Kumar Dutta, Do Hee Oh, Kyeongsu Kim,\* Jeong-Myeong Ha\* and Seo-Jung Han\*



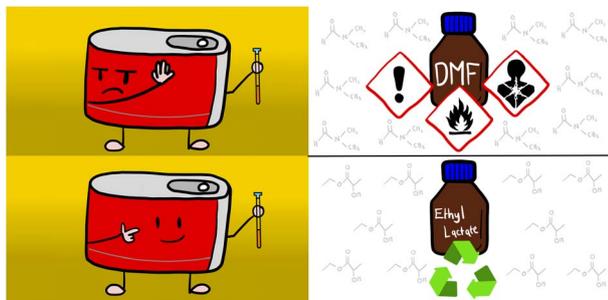
5470



### Reuse of consumable pipette tips for large-scale trace analysis of contaminants of emerging concern in wastewater

Amber Vaughan, Yassir El Hadri, Juditha Gurumurthy, William Francis, Margarita White, Eric Auyang, Stephanie Wright, Leon P. Barron and Helena Rapp-Wright\*

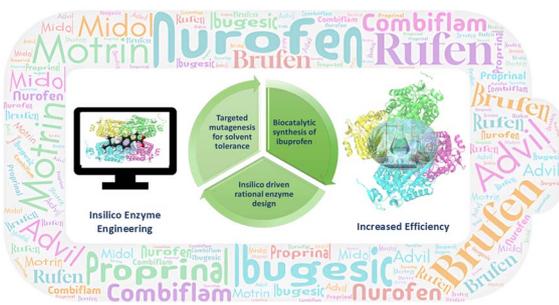
5486



### Introducing bioderived solvents for safer and more sustainable $^{19}\text{F}$ benchtop NMR analysis of pyrolysis oils

Bridget Tang,\* Jade Ré, Harry Partridge, Katie Chong, Arthur J. Ragauskas, Matthew J. Derry and Robert Evans

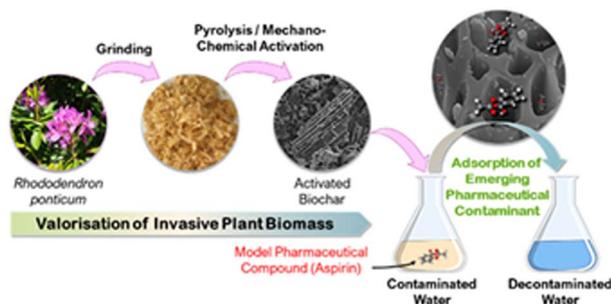
5495



### *In silico* enzyme engineering of aldehyde dehydrogenase for eco-friendly ibuprofen synthesis

Ankita Tripathi, Anisha Ashokan, Ipsita Basu, Sabhyata Gopal, Akash Ravandur, Shreya Shroff and Naveen Kulkarni\*

5507



### Valorisation of invasive plant (*Rhododendron ponticum*) biomass into activated biochar as a sustainable adsorbent for emerging pharmaceutical contaminant removal from water

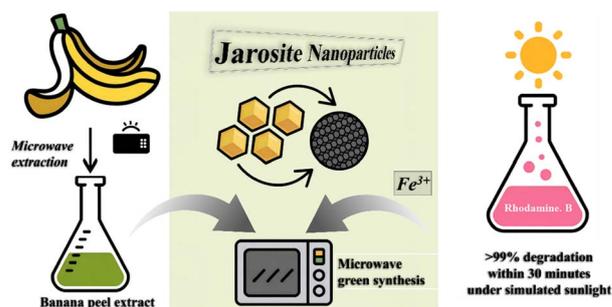
Tielidy A. de M. de Lima,\* Matheus S. T. Arantes, Jeovan A. Araújo, Gabriel G. de Lima, Dayanne R. M. Andrade, Emma J. Murphy, Washington L. E. Magalhães and Michael J. D. Nugent\*



5518

### Green synthesis of jarosite nanoparticles for photocatalytic degradation of Rhodamine B under simulated sunlight radiation

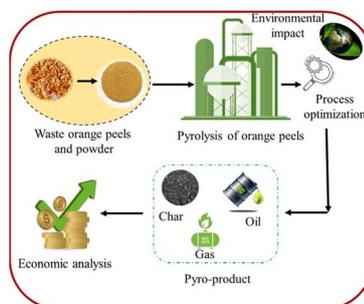
Hui Wen Neo, Eslam M. Hamed, Fun Man Fung\* and Sam F. Y. Li\*



5527

### Pyrolysis of orange peel waste to pyrofuels and pyrochar: optimization and techno-economic insights for industrial scale-up

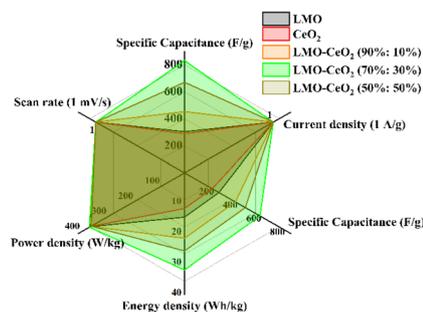
Uma Sankar Behera, Sourav Poddar\* and Hun-Soo Byun\*



5556

### Unveiling the synergistic potential of LaMnO<sub>3</sub>-CeO<sub>2</sub> composites in supercapacitor applications

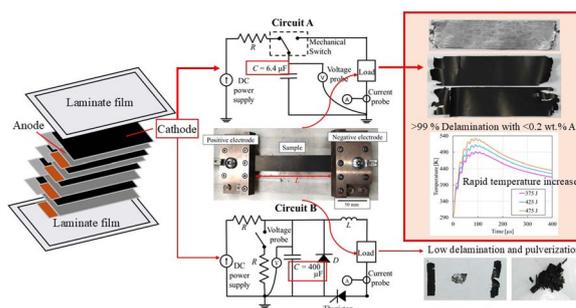
Alisha Dhakal,\* Felio Perez and Sanjay R. Mishra\*



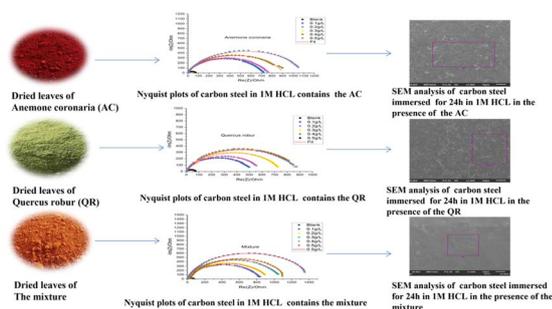
5571

### Low-capacitance pulsed discharge enables heat- and solvent-free delamination of lithium-ion battery cathodes

Chiharu Tokoro,\* Moe Nakahara, Takatoshi Kurihara, Akiko Kubota, Mauricio Córdova-Udaeta, Asako Narita and Yutaro Takaya



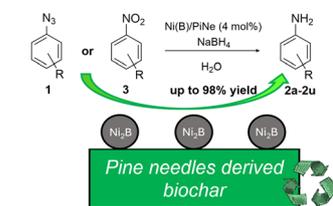
5580



### Synergistic effect between *Anemone coronaria* and *Quercus robur* leaf extracts on mild steel corrosion in HCl 1 M solution: electrochemical and computational study

Sofia Kerouad,\* Youssef El-Gheryby, Issam Forsal, Mohammed-Amine Edaala, Loubna Kabiri, Mohamed Mbarki and Latifa Bouissane

5594

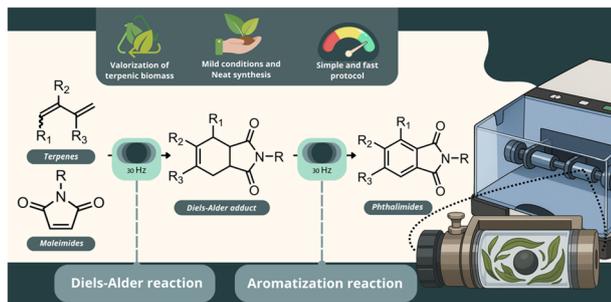


### A heterogeneous nickel-supported catalyst: a circular approach to amine synthesis *via* azide and nitro compound reduction

Filippo Campana, Filippo Boccerani, Federica Valentini, Davide Gandolfo, Dario Marchionni, Dmitri Gelman and Luigi Vaccaro\*

- ❖ Recoverable and reusable biomass derived  $\text{Ni}_3\text{B}$  catalyst
- ❖  $\text{NaBH}_4$  as safe and cheap reducing agent
- ❖ Mild reaction conditions and green solvent mediated work-up
- ❖ Chemoselective reductive process

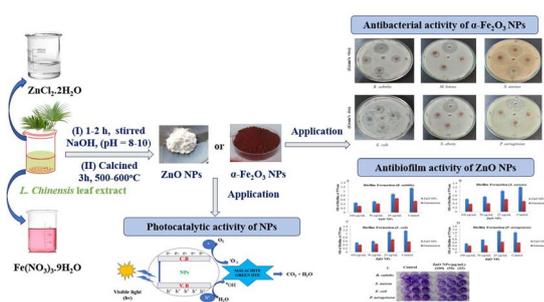
5601



### Mechanochemical synthesis of phthalimides from terpenes *via* tandem Diels-Alder cycloaddition and iodine-mediated aromatization

Jhully Anne Barros Carvalho Ribeiro, Renan Rodini Mattioli, Duncan L. Browne and Julio C. Pastre\*

5609



### Green synthesis of ZnO and $\alpha\text{-Fe}_2\text{O}_3$ nanoparticles using Chinese fan palm leaf extract for their biological and photocatalytic activity evaluation

Eklakh Veg, Azam Raza, Smita Rai, Pratibha Bansal, Swati Sharma, Nidhi Mishra, Riya Gupta, Shivam Mishra, Seema Joshi, Abdul Rahman Khan and Tahmeena Khan\*



5632

## A green strategy for treating nitrate-contaminated wastewater using a zeolite P-based composite derived from rice husk ash

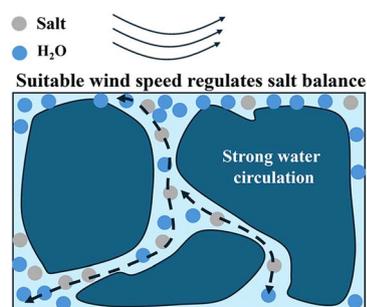
Nhu-Y Nguyen-Thi,\* Yen Nhi Nguyen-Thi, Cuong-Quoc Nguyen, Kim-Phung Ly, Nguyen Minh Nhut, Luong Huynh Vu Thanh, Quang Le Dang, Quang De Tran and Phuong Lan Tran-Nguyen



5641

## Salinity resistance and wind-enhanced evaporation of biomass-derived foam for sustainable solar desalination

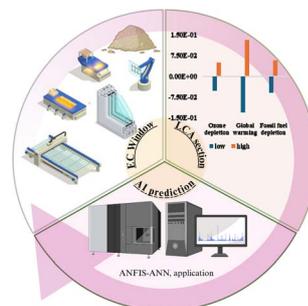
Wei Wang,\* Xi Huan,\* Jingnan Wang, Siyuan Kang, Yuheng Li, Ziyu Tian,\* Yining Li, Xue Wang and Jiang Fan



5653

## Assessing the environmental footprint of electrochromic windows: a comparative LCA with AI-based forecasting

Mohsen Rabbani, Olivia Tahti, Sabinus Essel Arthur, Macy A. Hopping, Christopher J. Barile, Mohd Hassan Karim, Ario Fahimi and Ehsan Vahidi\*



5665

## Environmental assessment of natural and fourth-generation synthetic refrigerant blends for sustainable cooling in India

Sandhiya Lakshmanan,\* Ranjana Aggarwal, Vikas Kumar Maurya, Sauvik Hossain S. K. and Kriti Tyagi

