

# RSC Sustainability

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## IN THIS ISSUE

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**Cover**  
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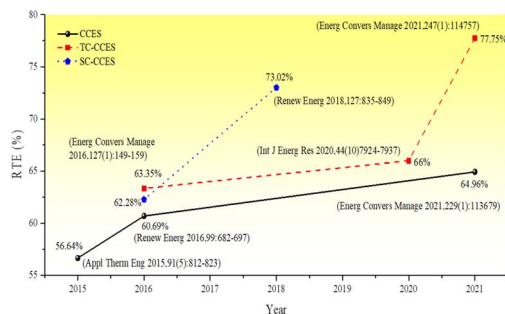
**Inside cover**  
See Francisco G. Cirujano, Belén Altava, Pedro Lozano, Eduardo García Verdugo *et al.*, pp. 2781–2804. Image reproduced by permission of Pedro Lozano from *RSC Sustainability.*, 2024, 2, 2781.

## CRITICAL REVIEWS

2731

### Advancements and assessment of compressed carbon dioxide energy storage technologies: a comprehensive review

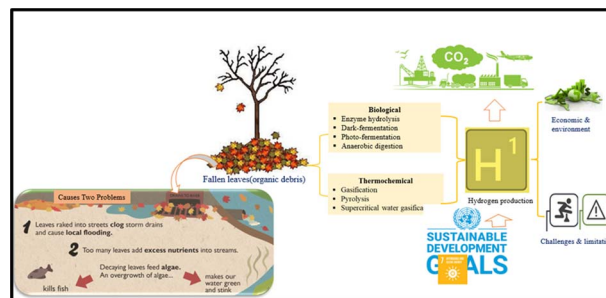
Hailing Ma, Yao Tong,\* Xiao Wang\* and Hongxu Wang\*



2751

### Fallen leaves to sustainable energy solution: review on hydrogen production

Kyu Kyu Tin, Wirach Taweepreda, Akanksha Singh, Naresh Kumar Wagri and Anil Kumar\*



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# EES Batteries

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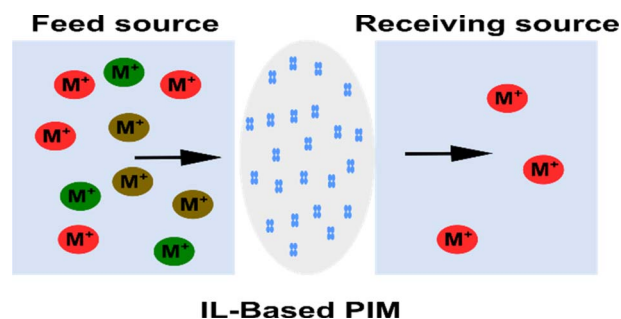
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## CRITICAL REVIEWS

2768

**Ionic liquid-based extraction of metal ions via polymer inclusion membranes: a critical review**

Babafemi Adigun, Bishnu P. Thapaliya,\* Huimin Luo and Sheng Dai\*

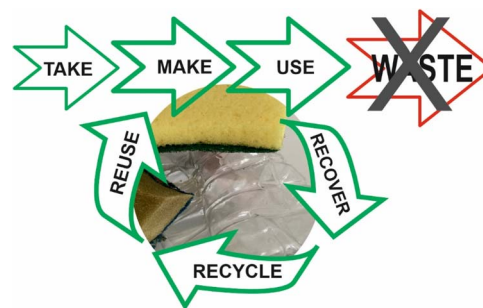


## TUTORIAL REVIEWS

2781

**On the metal- and bio-catalyzed solvolysis of polyesters and polyurethanes wastes**

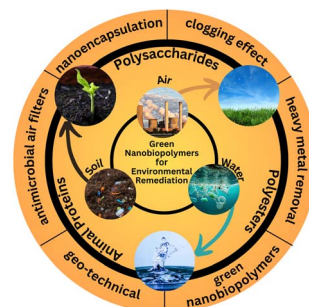
Francisco G. Cirujano,\* Rocio Villa, Rebeca Salas, Miguel Maireles, Nuria Martín, Belén Altava,\* Pedro Lozano\* and Eduardo García Verdugo\*



2805

**Greener nanobiopolymers and nanoencapsulation: environmental implications and future prospects**

Shikha Gulati,\* Anoushka Amar, Lakshita Chhabra, Riya Katiyar, Meenakshi, Tanu Sahu and Rajender S. Varma\*

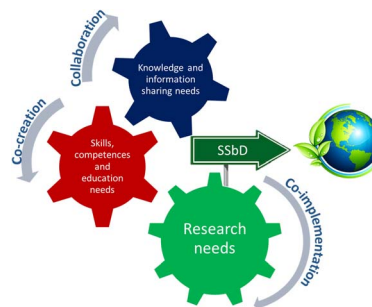


## PERSPECTIVE

2833

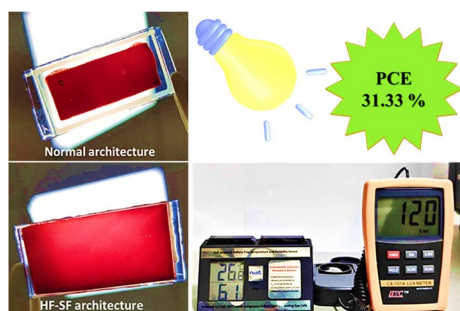
**Safe-and-sustainable-by-design roadmap: identifying research, competencies, and knowledge sharing needs**

Christina Apel, Akshat Sudheshwar, Klaus Kümmerer, Bernd Nowack, Klara Midander, Emma Strömberg and Lya G. Soeteman-Hernández\*



## COMMUNICATIONS

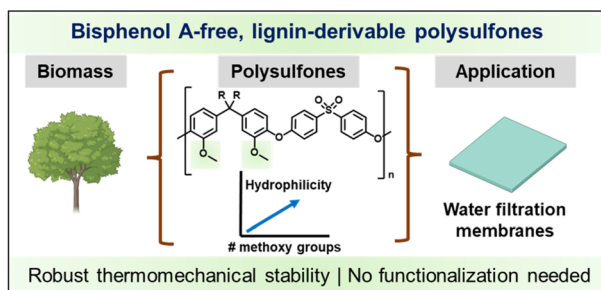
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### Engineered hole-free, spacer-free dye-sensitized light harvesters for indoor photovoltaic and self-powered applications

Andrew Simon George, Sourava Chandra Pradhan, K. N. Narayanan Unni and Suraj Soman\*

2844

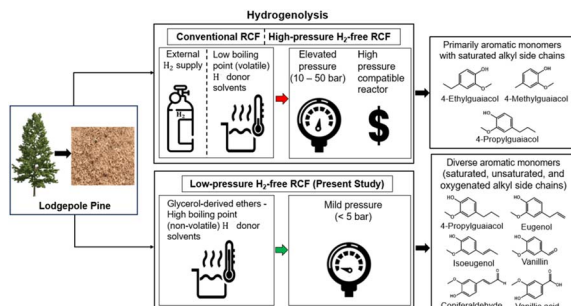


### Increased hydrophilicity of lignin-derivable vs. bisphenol-based polysulfones for potential water filtration applications

Jignesh S. Mahajan, Hoda Shokrollahzadeh Behbahani, Matthew D. Green,\* LaShanda T. J. Korley\* and Thomas H. Epps, III\*

## PAPERS

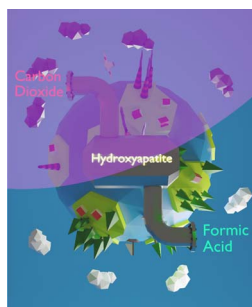
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### Glycerol-derived ethers enable hydrogen-free reductive catalytic fractionation of softwood lignin into functionalized aromatic monomers

Bernard C. Ekeoma, Jason E. Bara and James D. Sheehan\*

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### Establishing ultraporous permanently polarized hydroxyapatite as a green and highly efficient catalyst for carbon dioxide conversion in continuous flow under mild conditions

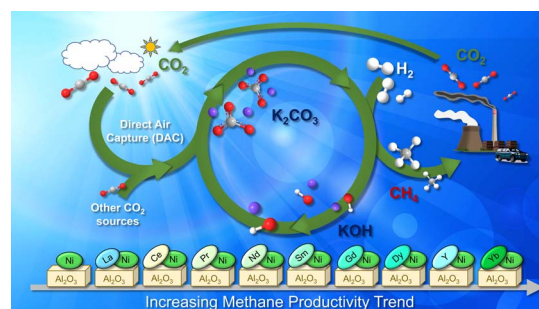
Marc Arnau, Jordi Sans,\* Pau Turon\* and Carlos Alemán\*



2885

### Lanthanide promoted nickel catalysts for the integrated capture and conversion of carbon dioxide to methane via metal carbonates

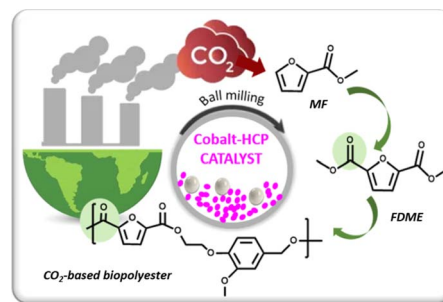
Christopher J. Koch, Zohaib Suhail, Prince, Anushan Alagaratnam, Matthew Coe, Alain Goeppert and G. K. Surya Prakash\*



2896

### Insertion of CO<sub>2</sub> to 2-methyl furoate promoted by a cobalt hypercrosslinked polymer catalyst to obtain a monomer of CO<sub>2</sub>-based biopolyesters

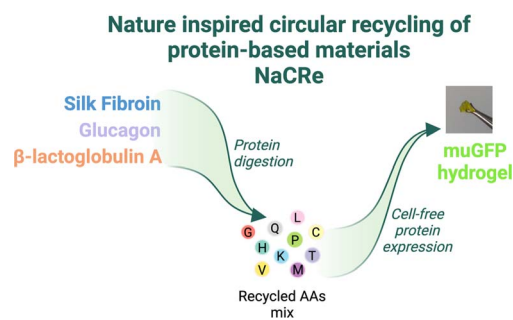
Elizabeth Rangel-Rangel, Beatriz Fuerte-Diez, Marta Iglesias and Eva M. Maya\*



2903

### Nature-inspired recycling of a protein mixture into a green fluorescent protein-based hydrogel

Laura Roset Julià, Sebastian J. Maerkl and Francesco Stellacci\*



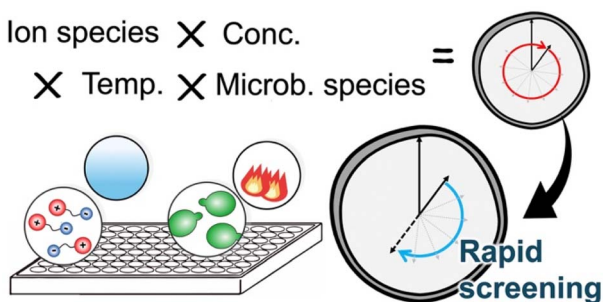
2910

### Enhancing the H<sub>2</sub> yield from photoreforming of natural lignocellulose feedstock by two-stage thermo-alkaline hydrolysis pretreatment

Wei Wang, Zhenyu Jin, Binhai Cheng\* and Ming Zhao\*



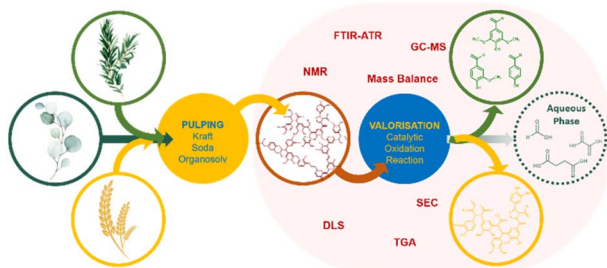
2921

Ion species  $\times$  Conc. $\times$  Temp.  $\times$  Microb. species =

### Rapid screening of toxicity to thermotolerant yeasts: inhibition of growth and fermentation by ionic liquids and zwitterions

Mayu Shibata, Ayumi Hachisu, Souta Uemori, Hitomi Tobe, Kazuaki Ninomiya and Kosuke Kuroda\*

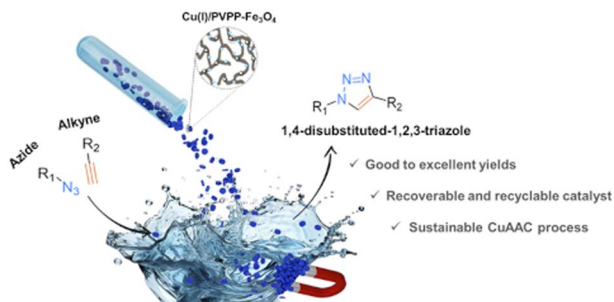
2930



### Copper catalyzed alkaline aerobic lignin depolymerization: effect of botanical origin and industrial extraction process on reactivity supported through characterization

Antonio Hernández-Mañas, Alex Martínez-Martin, Johan Madignier, Pascal Fongarland, Frédérique Bertaud, Léa Vilcocq\* and Laurent Djakovitch\*

2949



### Magnetic polyvinylpolypyrrolidone polymer composite-supported copper(I) catalyst: an efficient and easily reusable catalyst for sustainable synthesis of 1,2,3-triazoles in water

Noura Aflak,\* Fatima-Ezzahraa Essebbar, Lahoucine Bahsis, Hicham Ben El Ayouchia, Hafid Anane, Miguel Julve and Salah-Eddine Stiriba\*

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### Introduction of the first commercial biobased benzoxazines for the manufacturing of fibre reinforced polymers

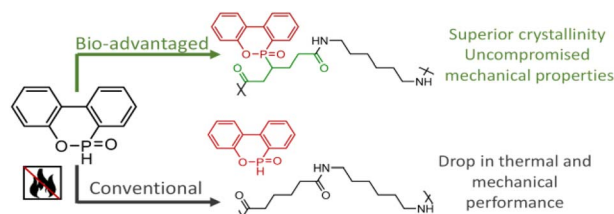
Gideon Abels, Katharina Koschek, Paul Jones and Wendy Howarth\*



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### Leveraging the bio-enabled muconic acid platform *via* phospho-Michael-addition: intrinsically flame-retardant nylon-66/DOPO copolymers

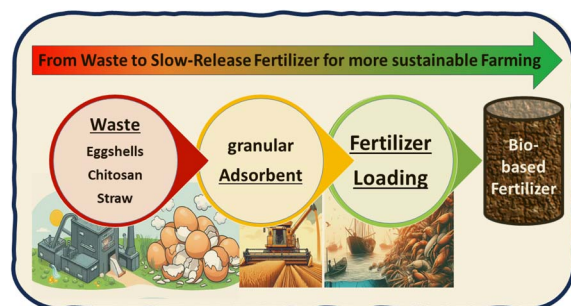
Prerana Carter, Peter M. Meyer, Ting-Han Lee, Dhananjay Dileep, Nickolas L. Chalgren, Sohaima Noreen, Michael J. Forrester, Brent H. Shanks,\* Jean-Philippe Tessonnier\* and Eric W. Cochran\*



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### Sustainable agro-waste pellets as granular slow-release fertilizer carrier systems for ammonium sulfate

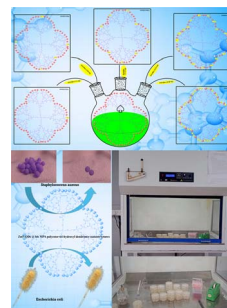
B. G. K. Steiger, N. T. Bui, B. M. Babalola and L. D. Wilson\*



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### Synthesis, characterization and antimicrobial activity of ZnO-QDs @ bis MPA polyester-64-hydroxyl dendrimer nanostructures

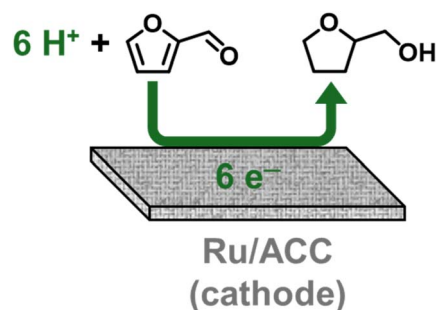
Archana Zala\* and Harshad Patel



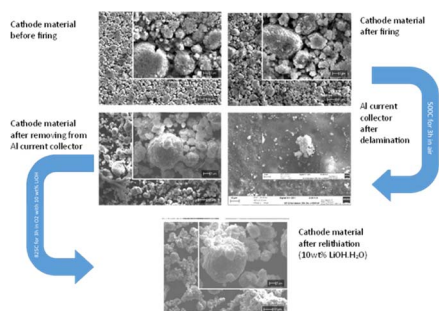
3001

### Electrocatalytic hydrogenation of the formyl group and heteroaromatic ring in furfural on activated carbon cloth-supported ruthenium

Meheryar R. Kasad, James E. Jackson and Christopher M. Saffron\*



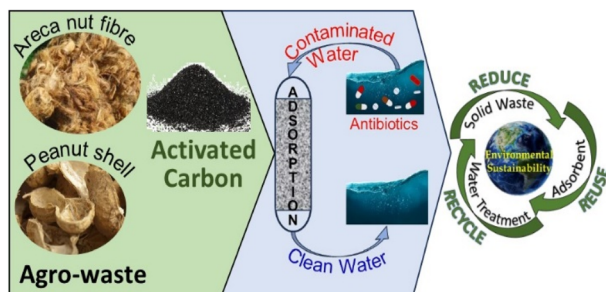
3014



## Direct recycling of EV production scrap NMC532 cathode materials

Emily C. Giles, Abbey Jarvis, Alexander T. Sargent, Paul A. Anderson, Phoebe K. Allan and Peter R. Slater\*

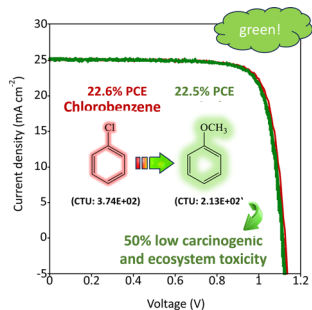
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## Activated carbon with composite pore structures made from peanut shell and areca nut fibers as sustainable adsorbent material for the efficient removal of active pharmaceuticals from aqueous media

Sujata Mandal,\* Dayana Stephen and Sreeram Kalarical Janardhanan

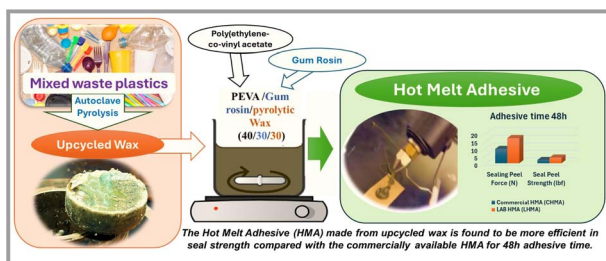
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## Validating the "greenness" of chemicals via life cycle assessment: the case of anisole as an anti-solvent in perovskite solar cells

A. Kamal Kamali,\* Nilanka M. Keppetipola, Yuka Yoshihara, Ajay Kumar Jena, Satoshi Uchida, Hiroshi Segawa, Guido Sonnemann, Thierry Toupance and Ludmila Cojocar\*

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## Upcycled waxes from mixed polyolefins for hot-melt adhesive (HMA) applications

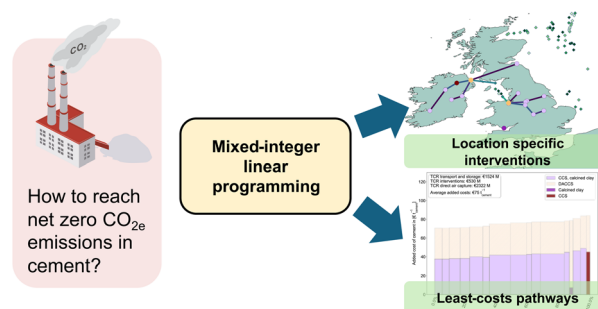
Anurag Ganapathi, Mohamed Shaker and Muhammad Rabnawaz\*



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## Finding least-cost net-zero CO<sub>2e</sub> strategies for the European cement industry using geospatial techno-economic modelling

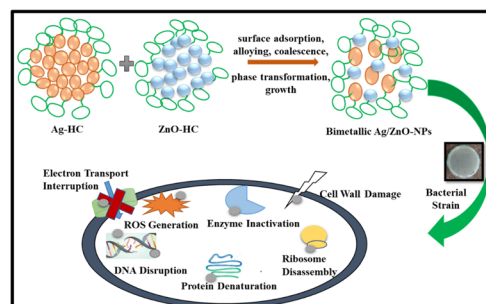
Till Strunge,\* Lukas Küng, Nixon Sunny, Nilay Shah, Phil Renforth and Mijndert Van der Spek\*



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## Eco-friendly synthesis and enhanced antibacterial action of bimetallic Ag/ZnO nanoparticles using *Hylocereus costaricensis* stem extract

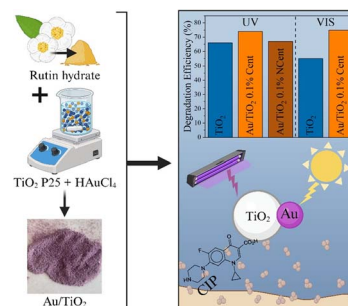
Joel Xaviour, S. Sreelekshmi, Jebin Joseph, S. Alfiya Fathima and T. Sajini\*



3090

## Towards green visible range active photocatalytic Au/TiO<sub>2</sub> nanocomposites through rutin-based synthesis and their application in the degradation of ciprofloxacin

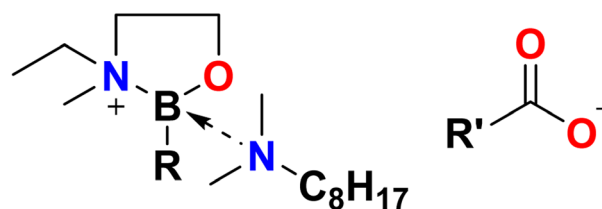
Inês Catarina Gomes Espada, Noelia González-Ballesteros, Carlos J. Tavares, Senentxu Lanceros-Méndez\* and Pedro M. Martins\*



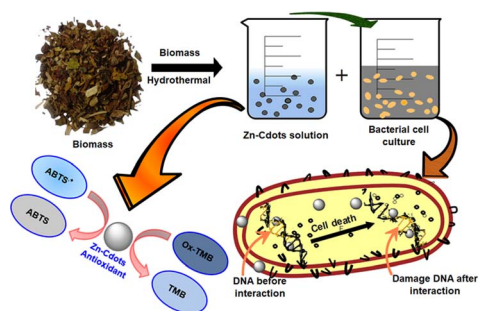
3100

## Task-specific boronium ionic liquids as ashless lubricant additives

Novina Malviya, Farah Fazlina M. Yasin, Maria Teresa Sateriale, Fergal Coleman, H. Q. Nimal Gunaratne, Andrea Dolfi, Geetha Srinivasan and Matgorzata Swadźba-Kwaśny\*



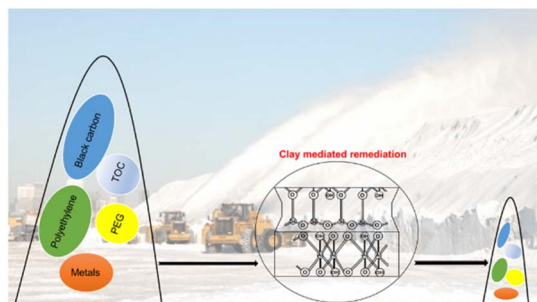
3114



### Biologically active dual functional zinc-doped biomass-derived carbon dots

Mohammad Tariq, Mo Ahamad Khan, Hammad Hasan, Sangeeta Yadav, Amaresh Kumar Sahoo\* and Md Palashuddin Sk\*

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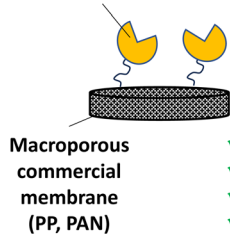


### Clay mineral-based sustainable snow contaminant remediation technology

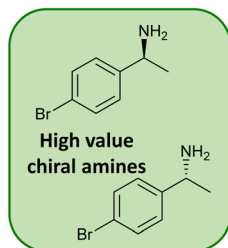
Benilde Mizero, Saba Naderi, Sandeep Bose, Houjie Li and Parisa A. Ariya\*

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### Immobilized Transaminase



- ✓ Active
- ✓ Reusable
- ✓ Mild conditions
- ✓ Enantioselective



### Membrane-immobilized transaminases for the synthesis of enantiopure amines

Hippolyte Meersseman Arango, Xuan Dieu Linh Nguyen, Patricia Luis, Tom Leyssens, David Roura Padrosa, Francesca Paradisi and Damien P. Debecker\*

