

IN THIS ISSUE

ISSN 2753-8125 CODEN RSSUAN 2(10) 2719–3154 (2024)



Cover

See James D. Sheehan *et al.*, pp. 2851–2870. Image generated by Adobe Firefly. Image reproduced by permission of Bernard C. Ekeoma, Jason E. Bara and James D. Sheehan from *RSC Sustainability*, 2024, 2, 2851.



Inside cover

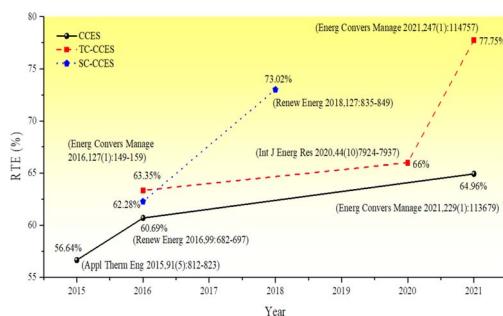
See Francisco G. Cirujano, Belén Altava, Pedro Lozano, Eduardo García Verdugo *et al.*, pp. 2781–2804. Image reproduced by permission of Pedro Lozano from *RSC Sustainability*, 2024, 2, 2781.

CRITICAL REVIEWS

2731

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

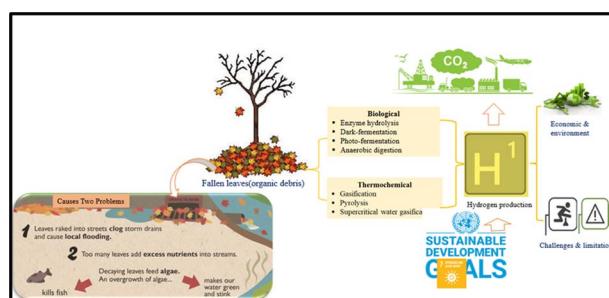
Hailing Ma, Yao Tong,* Xiao Wang* and Hongxu Wang*



2751

Fallen leaves to sustainable energy solution: review on hydrogen production

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



EES Batteries

**Exceptional research on
batteries and energy storage**

Part of the EES family

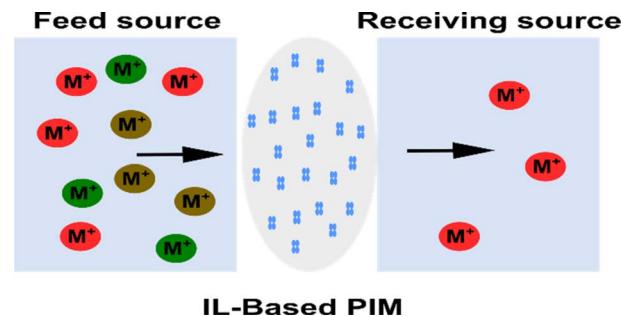
**Join
in** | Publish with us
rsc.li/EESBatteries

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

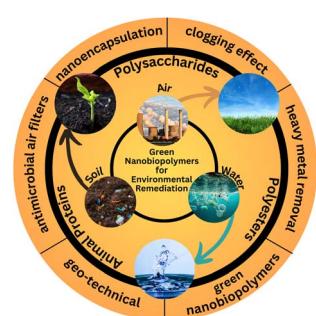
Francisco G. Cirujano,* Rocio Villa, Rebeca Salas, Miguel Maireles, Nuria Martín, Belén Altava,* Pedro Lozano* and Eduardo García Verdugo*



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*



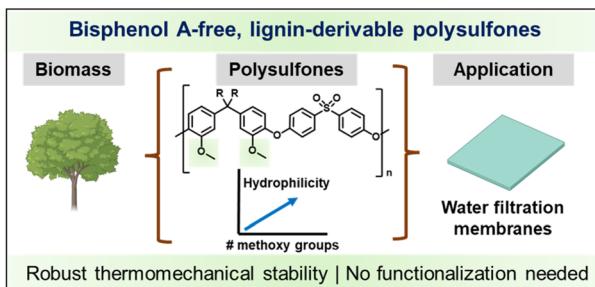
COMMUNICATIONS

2839


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*

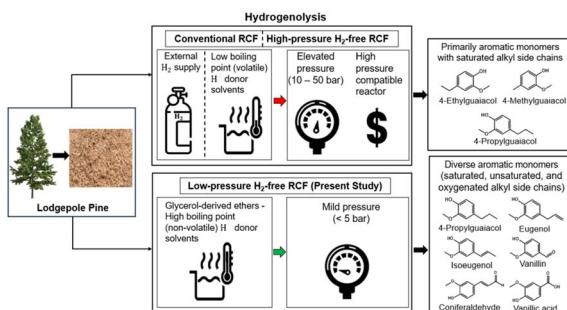
2844


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

2851


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*

2871


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*

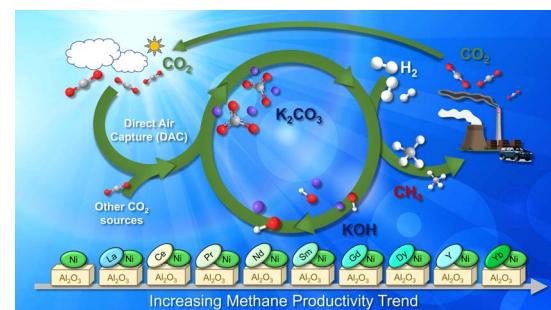


PAPERS

2885

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

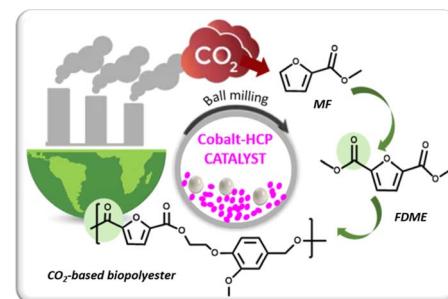
Christopher J. Koch, Zohaib Suhail, Prince, Anushan Alagaratnam, Matthew Coe, Alain Goeppert and G. K. Surya Prakash*



2896

Insertion of CO₂ to 2-methyl furoate promoted by a cobalt hypercrosslinked polymer catalyst to obtain a monomer of CO₂-based biopolymers

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

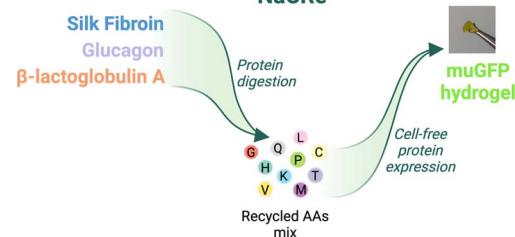


2903

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

Laura Roset Julià, Sebastian J. Maerkli and Francesco Stellacci*

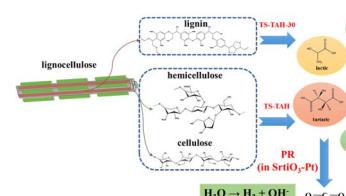
Nature inspired circular recycling of protein-based materials NaCRe



2910

Enhancing the H₂ yield from photoreforming of natural lignocellulose feedstock by two-stage thermo-alkaline hydrolysis pretreatment

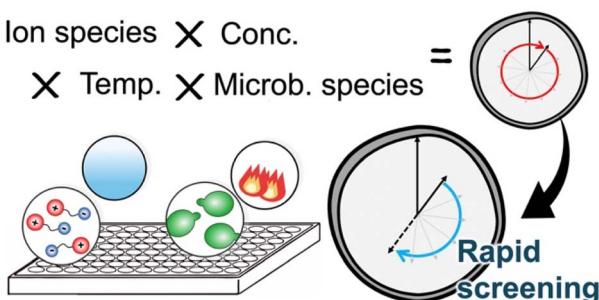
Wei Wang, Zhenyu Jin, Binhai Cheng* and Ming Zhao*



PAPERS

2921

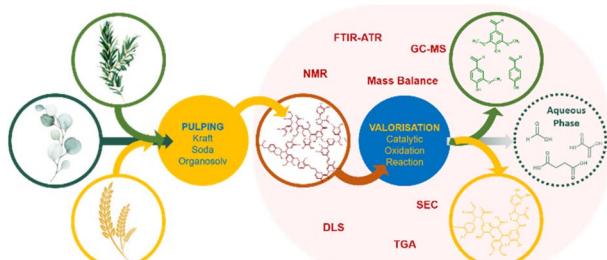
Ion species \times Conc.
 \times Temp. \times Microb. species



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*

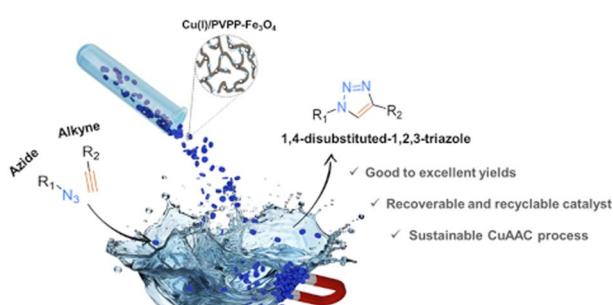
2930



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(II) 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*

2959



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

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

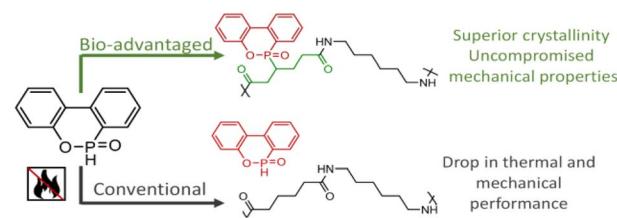


PAPERS

2968

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

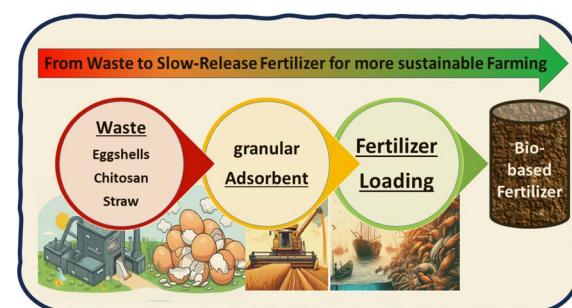
Prerana Carter, Peter M. Meyer, Ting-Han Lee, Dhananjay Dileep, Nickolas L. Chalgren, Sohaima Noreen, Michael J. Forrester, Brent H. Shanks,* Jean-Philippe Tessonnier* and Eric W. Cochran*



2979

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

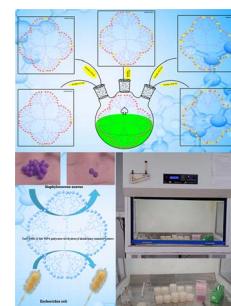
B. G. K. Steiger, N. T. Bui, B. M. Babalola and L. D. Wilson*



2989

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

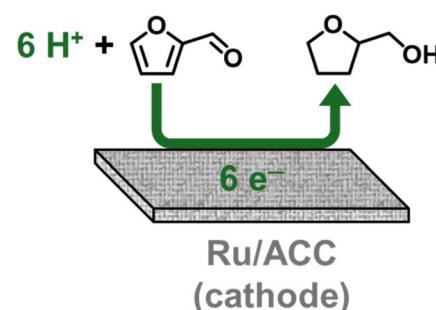
Archana Zala* and Harshad Patel



3001

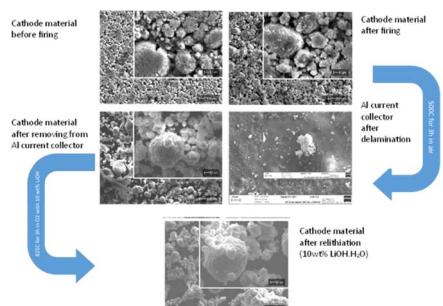
Electrocatalytic hydrogenation of the formyl group and heteroaromatic ring in furfural on activated carbon cloth-supported ruthenium

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



PAPERS

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*

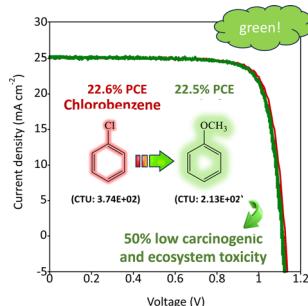
3022



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

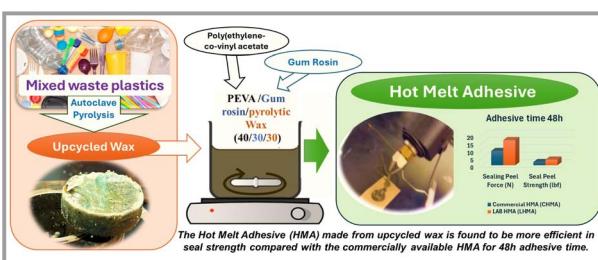
3036



Validating the "greeness" 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 Toupane and Ludmila Cojocaru*

3047



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

Anurag Ganapathi, Mohamed Shaker and Muhammad Rabnawaz*

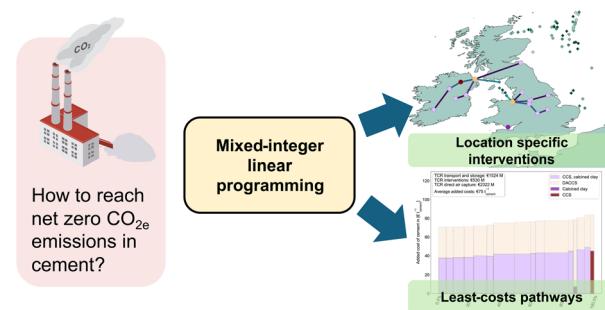


PAPERS

3054

Finding least-cost net-zero CO₂e strategies for the European cement industry using geospatial techno-economic modelling

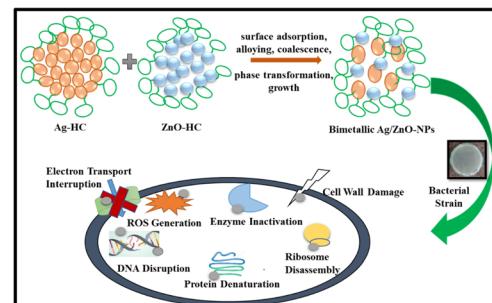
Till Strunge,* Lukas Küng, Nixon Sunny, Nilay Shah, Phil Renforth and Mijndert Van der Spek*



3077

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

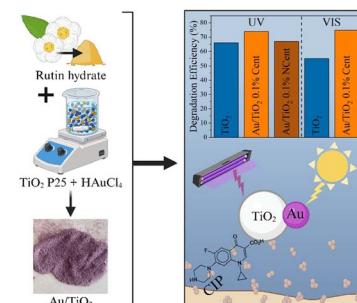
Joel Xaviour, S. Sreelekshmi, Jebin Joseph, S. Alfiya Fathima and T. Sajini*



3090

Towards green visible range active photocatalytic Au/TiO₂ nanocomposites through rutin-based synthesis and their application in the degradation of ciprofloxacin

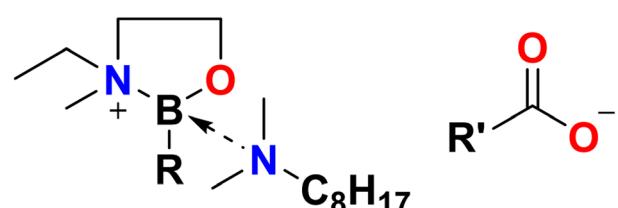
Inês Catarina Gomes Espada, Noelia González-Ballesteros, Carlos J. Tavares, Senentxu Lanceros-Méndez* and Pedro M. Martins*



3100

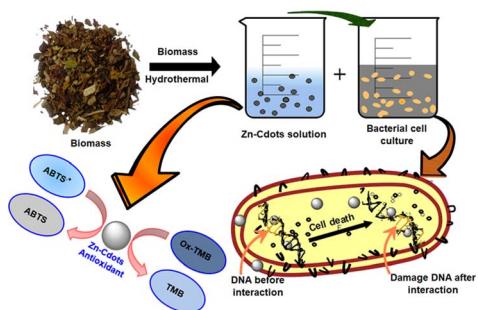
Task-specific boronium ionic liquids as ashless lubricant additives

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



PAPERS

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*

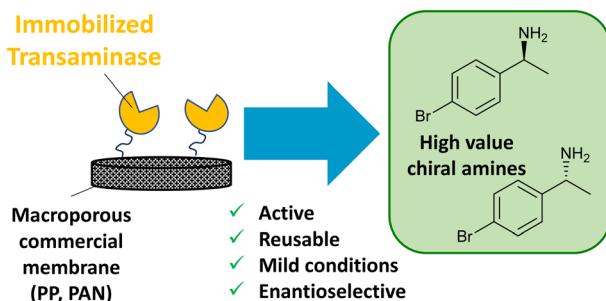
3123



Clay mineral-based sustainable snow contaminant remediation technology

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

3139



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*