

IN THIS ISSUE

ISSN 2753-8125 CODEN RSSUAN 2(4) 725–1166 (2024)



Cover

See Gyorgy Szekely, pp. 871–880. Image reproduced by permission of KAUST from RSC. *Sustainability*, 2024, 2, 871. Designed and illustrated by Ana Bigio.



Inside cover

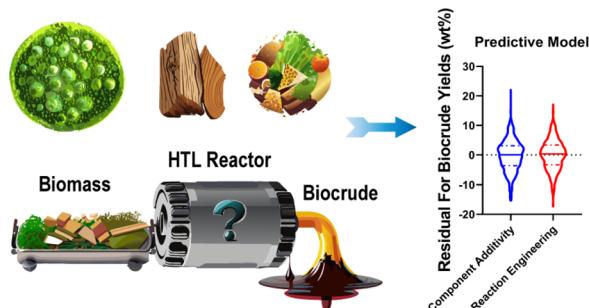
See Jason Y. C. Lim, Vinicius Rosa et al., pp. 881–902. Image reproduced by permission of Vinicius Rosa from RSC. *Sustainability*, 2024, 2, 881.

CRITICAL REVIEWS

736

Review and assessment of models for predicting biocrude yields from hydrothermal liquefaction of biomass

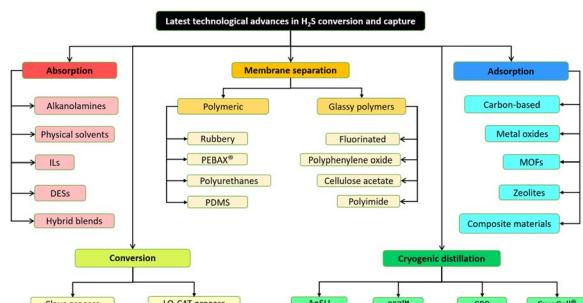
Peter M. Guirguis, Mahadevan Subramanya Seshasayee, Bita Motavaf and Phillip E. Savage*



757

Latest technological advances and insights into capture and removal of hydrogen sulfide: a critical review

Muhammad Syahir Aminuddin,* Mohamad Azmi Bustam and Khairiraihanna Johari*



RSC Advances

**At the heart of open access for
the global chemistry community**

Editor-in-chief

Russell J Cox

Leibniz Universität Hannover, Germany

We stand for:



Breadth We publish work in all areas of chemistry and reach a global readership



Quality Research to advance the chemical sciences undergoes rigorous peer review for a trusted, society-run journal



Affordability Low APCs, discounts and waivers make publishing open access achievable and sustainable



Community Led by active researchers, we publish quality work from scientists at every career stage, and all countries

Submit your work now

rsc.li/rsc-advances

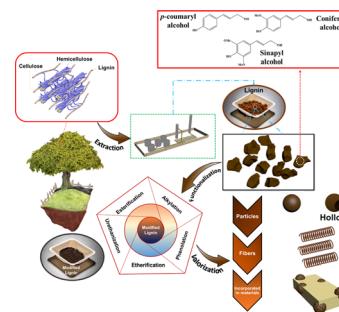
@RSC_Adv

CRITICAL REVIEWS

804

Valorization of lignin for advanced material applications: a review

Rohan Shorey, Ayyoub Salaghi, Pedram Fatehi and Tizazu H. Mekonnen*

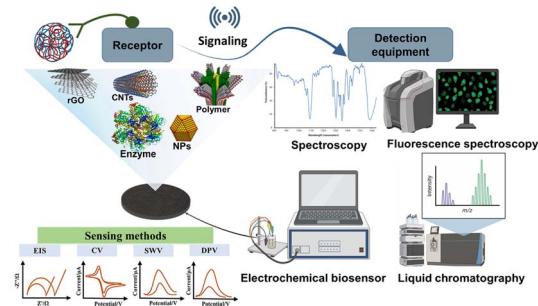


TUTORIAL REVIEWS

832

Nanomaterial-based electrochemical chemo(bio) sensors for the detection of nanoplastic residues: trends and future prospects

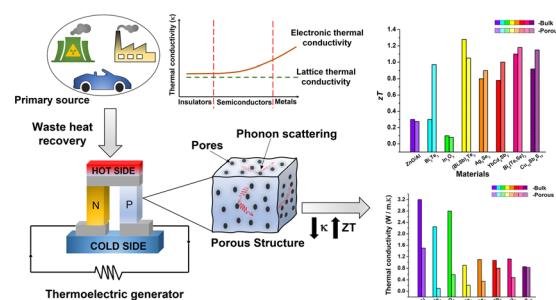
Siwar Jebril, Zina Fredj,* Ayman Ali Saeed, Anne-Marie Gonçalves, Mandheer Kaur, Ashwani Kumar and Baljit Singh*



852

The power of pores: review on porous thermoelectric materials

Umar Ijaz, Muhammad Siyar* and Chan Park*



PERSPECTIVES

871

The 12 principles of green membrane materials and processes for realizing the United Nations' sustainable development goals

Gyorgy Szekely*



PERSPECTIVES

881

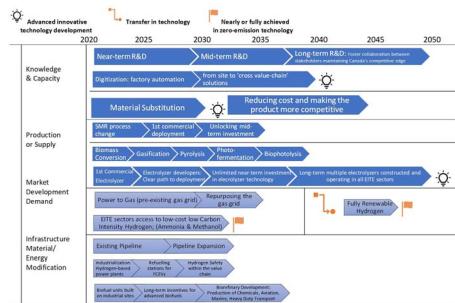
Plastics in oral healthcare: moving away from landfills to create value



The global burden of plastics in oral health: prospects for circularity, sustainable materials development and practice

Albert Ong, Jerald Y. Q. Teo, David C. Watts, Nikolaos Silikas, Jason Y. C. Lim* and Vinicius Rosa*

903

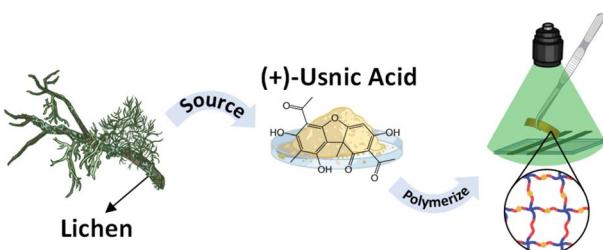


Emissions-intensive and trade-exposed industries: technological innovation and climate policy solutions to achieve net-zero emissions by 2050

Anahita Mani, Thomas Budd and Elicia Maine

COMMUNICATION

928

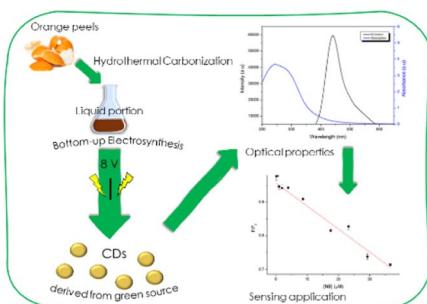


Photopolymerization of lichen derived usnic acid

Ruby R. Zhou, Jack L. Vargo, Bella G. Andjelkovic, Maya G. Vermeer, Spencer J. Goyette and Bassil M. El-Zaatari*

PAPERS

933



Carbon nanodots from orange peel waste as fluorescent probes for detecting nitrobenzene

Cinzia Michenzi,* Anacleto Proietti, Marco Rossi, Claudia Espro, Viviana Bressi, Fabrizio Vetica, Beatrice Simonis and Isabella Chiarotto*

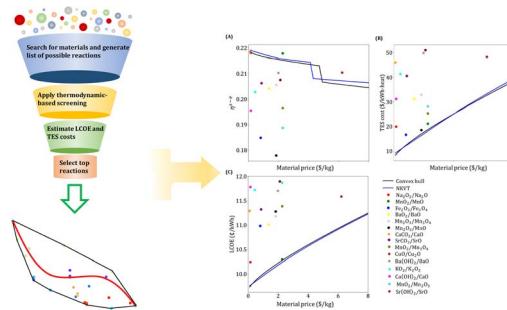


PAPERS

943

Screening and property targeting of thermochemical energy storage materials in concentrated solar power using thermodynamics-based insights and mathematical optimization

Ishan Bajaj, Xinyue Peng and Christos T. Maravelias*



961

Recycling hazardous and energy-demanding piezoelectric ceramics using an oxide–halide perovskite upside-down composite method

Sivagnana Sundaram Anandakrishnan,
Mohadeseh Tabeshfar, Mikko Nelo, Jani Peräntie,
Heli Jantunen, Jari Juuti and Yang Bai*



975

Castor-oil biobased foam: the effect of the composition on the physical and mechanical properties *via* a statistical mixture design

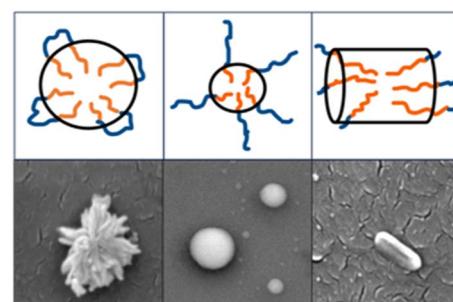
Luiza Fernandes Soares, Júlio César dos Santos, Victor Augusto Araújo de Freitas, Robson Bruno Dutra Pereira, Túlio Hallak Panzera* and Fabrizio Scarpa*



988

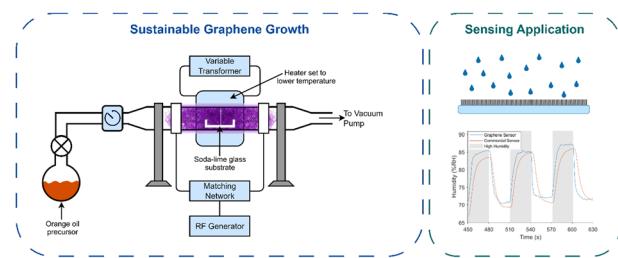
Tailoring lignin nanoparticle properties: the effects of pH and salt on shape and antioxidant capacity

Natalia Obrzut, Rob Hickmott and Kimberly Gray*



PAPERS

995



Sustainable low temperature carrier gas-free growth of graphene on non-catalytic substrates

Laurance Papale, Bronson Philippa,* Boris Makarenko, Oommen K. Varghese and Mohan V. Jacob*

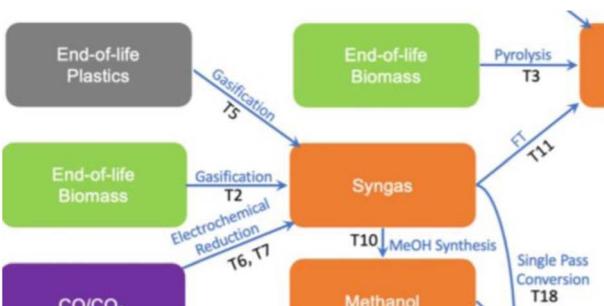
1003



Hydrogen peroxide assisted synthesis of fluorescent carbon nanoparticles from teak leaves for dye-sensitized solar cells

Arup Kumer Roy,* William Ghann, Saswata Rabi, Jackson Barua, Sumit Majumder, Ruhul Amin, M. K. Mohammad Ziaul Hyder and Jamal Uddin*

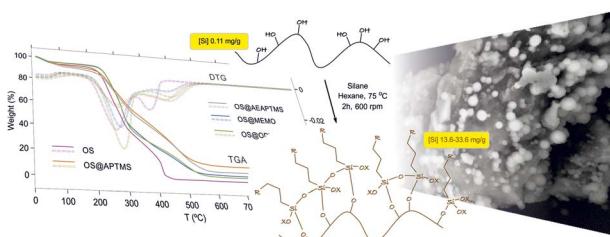
1014



Counterfactual sustainability screening – the definition and undertaking of a sustainability screening method for the assessment of defossilised supply chains

Edward G. Platt and Peter Styring*

1030



High degree of silanization of olive wood shell stone and its use in polyester biocomposites

Melissa Olmedo-Navarro, Juana M. Pérez,* Natalia Gutiérrez-Segura, Bernardo Sánchez-Sevilla, Yolanda Soriano-Jerez, Diego A. Alonso, Mari Carmen Cerón and Ignacio Fernández*

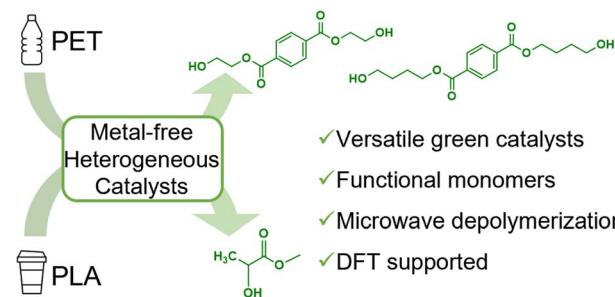


PAPERS

1040

Guanidine functionalized porous SiO_2 as heterogeneous catalysts for microwave depolymerization of PET and PLA

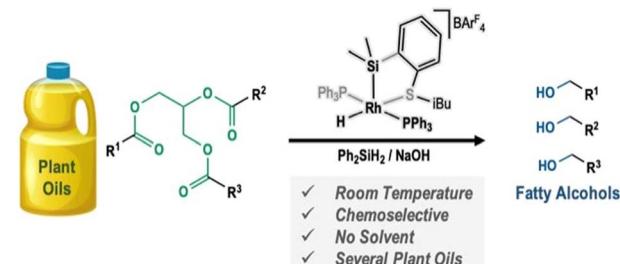
Éadaoin Casey, Rachel Breen, Gerard Pareras, Albert Rimola, Justin D. Holmes and Gillian Collins*



1052

Direct chemoselective reduction of plant oils using silane catalysed by $\text{Rh}^{(III)}$ complexes at ambient temperature

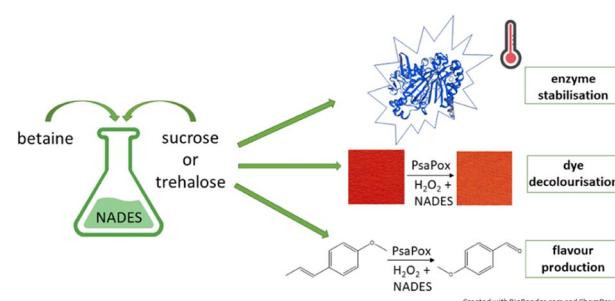
Unai Prieto-Pascual, Itxaso Bustos, Zoraida Freixa,* Amit Kumar* and Miguel A. Huertos*



1058

Improving the stability and activity of a dye-decolourizing peroxidase using NADESs

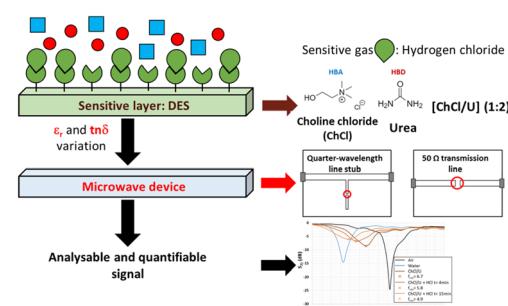
Maria Garbe,* Linnea Ute Lutz, Leander Tom Lehmann, Theresa Strotmann, Ralf G. Berger and Franziska Ersoy



1067

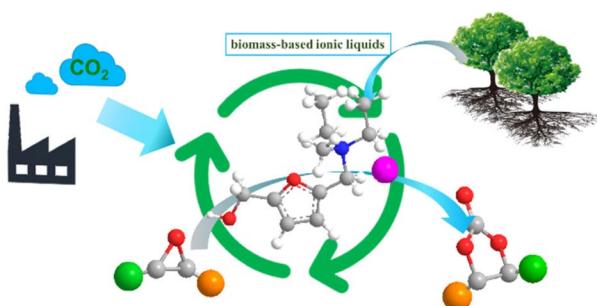
The use of deep eutectic solvents as a promising approach in the design of microwave-based green gas sensors

Emilie Bertrand,* Mohamed Himdi, David Rondeau, Xavier Castel, Thomas Delhaye and Ludovic Paquin



PAPERS

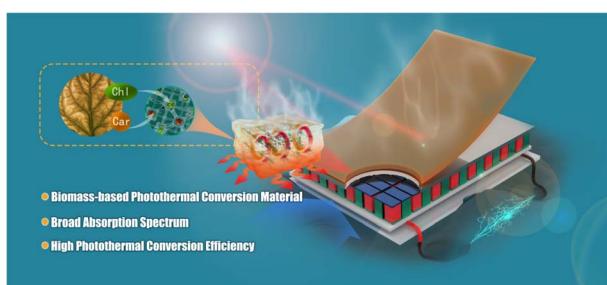
1074



Biomass-based ionic liquids efficiently catalyzed the cycloaddition reaction of epoxides with CO_2 by hydrogen-bonding and the anion cooperative effect

Kaixin Guo, Na Ji, Feng Han,* Qingfeng Yang, Ning Wang and Chengxia Miao*

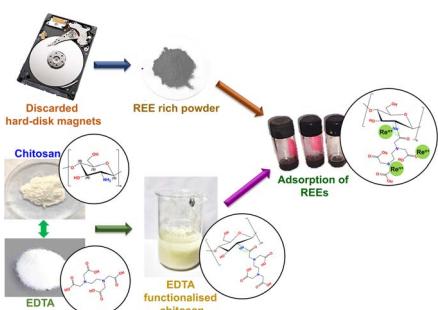
1081



A biomass hydrogel solar evaporator based on low-grade tobacco leaves for water evaporation and thermoelectric conversion applications

Zuoyu Wang, Lu Han, Gaolei Xi, Tao Jia,* Yi Liu, Xiao He, Hongxia Wang* and Bin Li*

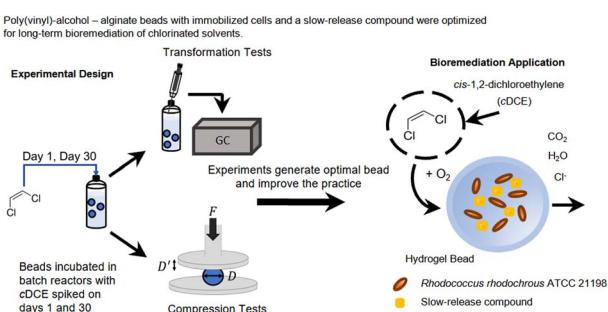
1088



Recovery of rare earth elements (Nd, Dy) from discarded hard disk magnets using EDTA functionalised chitosan

Shruti Srivastava, Anurag Bajpai, Syed Mohammad Musthaq and Krishanu Biswas*

1101



The optimization of poly(vinyl)-alcohol-alginate beads with a slow-release compound for the aerobic cometabolism of chlorinated aliphatic hydrocarbons

Conor G. Harris, Hannah K. Gedde, Audrey A. Davis, Lewis Semprini, Willie E. Rochefort and Kaitlin C. Fogg*

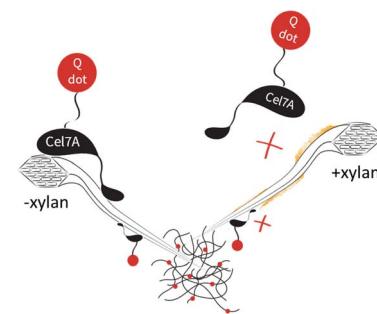


PAPERS

1118

Xylan inhibition of cellulase binding and processivity observed at single-molecule resolution

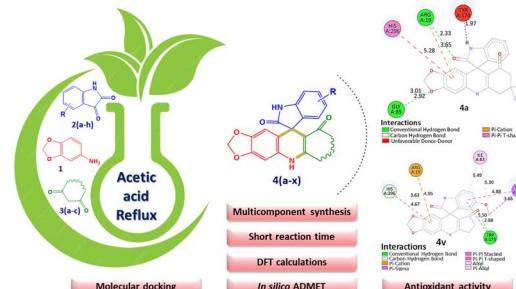
Nerya Zexer, Alec Paradiso, Daguan Nong, Zachary K. Haviland, William O. Hancock and Charles T. Anderson*



1128

In silico exploration of acetic acid driven multicomponent synthesis: design, characterization, and antioxidant evaluation of spiroacridines and spiroquinolines

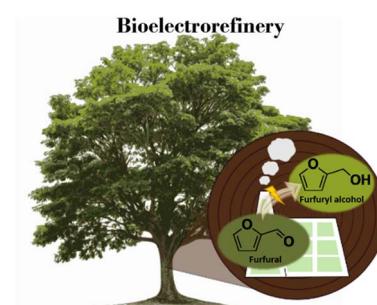
Subham G. Patel, Dipti B. Upadhyay, Nirajkumar V. Shah, Mehl P. Parmar, Paras J. Patel, Apoorva Malik, Rakesh K. Sharma and Hitendra M. Patel*



1142

Revisiting the electrocatalytic hydrogenation of furfural to furfuryl alcohol using biomass-derived electrolytes

Maria Wolfsgruber, Robert H. Bischof, Christian Paulik, Adam Slabon* and Bruno V. M. Rodrigues*



1154

Ionic liquid strategy for chitosan production from chitin and molecular insights

Van Minh Dinh,* Santosh Govind Khokarale, Pedro Ojeda May, Tobias Sparrman, Knut Irgum and Jyri-Pekka Mikkola*

