

IN THIS ISSUE

ISSN 2753-8125 CODEN RSSUAN 3(4) 1587–1984 (2025)



Cover

See Yasushi Sekine *et al.*, pp. 1598–1628. Image reproduced by permission of Yasushi Sekine from *RSC Sustainability*, 2025, 3, 1598.



Inside cover

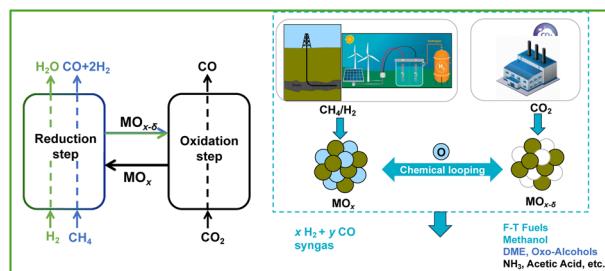
See Pratheep K. Annamalai, Ashok Kumar Nanjundan, Darren J. Martin *et al.*, pp. 1691–1704. Image reproduced by permission of Afzal, Kumar, Tebyetekerwa, Burey, Bell, Nanjundan & Martin from *RSC Sustainability*, 2025, 3, 1691.

CRITICAL REVIEWS

1598

CO₂ conversion to CO by reverse water gas shift and dry reforming using chemical looping

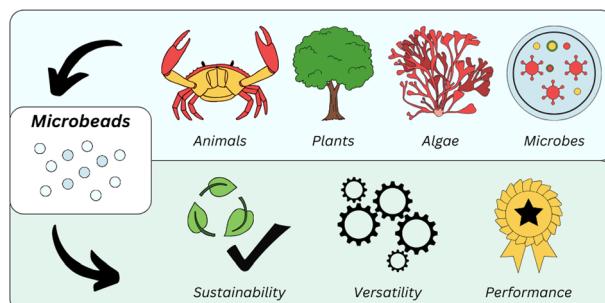
Keke Kang, Hiroshi Sampei and Yasushi Sekine*



1629

Carbohydrate-based alternatives to traditional synthetic plastic microbeads: a critical review

Amy McMackin and Sébastien Cardinal*



EES Solar

**Exceptional research on solar
energy and photovoltaics**

Part of the EES family

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

CRITICAL REVIEWS

1652

Incorporating hyperaccumulating plants in phytomining, remediation and resource recovery: recent trends in the African region – a review

Babatunde Joseph Akinbile* and Charles Mbohwa*



PERSPECTIVE

1672

Chemical bio-manufacture from diverse C-rich waste polymeric feedstocks using engineered microorganisms

Maria Franca Pitzalis and Joanna C. Sadler*

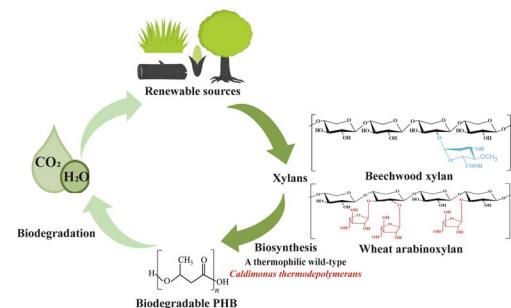


COMMUNICATION

1685

Polyhydroxyalkanoate (PHA) production by thermophilic *Caldimonas thermodepolymerans* comb. nov. from xylan

Wen Zhou, Salvador Bertrán Llorens, Peter J. Deuss, Gert-Jan W. Euverink and Janneke Krooneman*

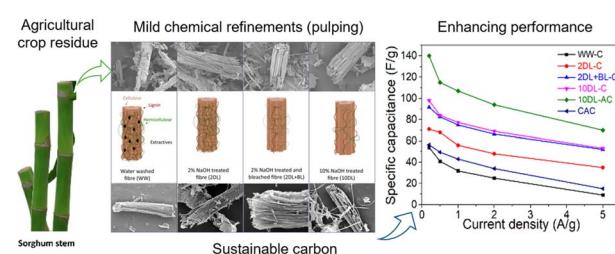


PAPERS

1691

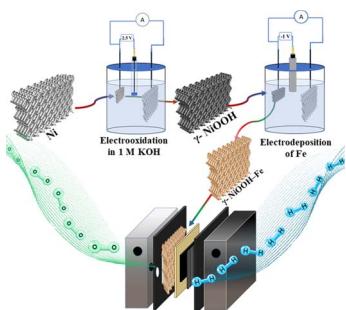
Sustainable carbon for energy storage applications: investigation on chemical refinements of sorghum biomass for tuneability of carbon structures and supercapacitor performance

Rana Arslan Afzal, Pratheep K. Annamalai,* Mike Tebyetekerwa, Paulomi (Polly) Burey, John Bell, Ashok Kumar Nanjundan* and Darren J. Martin*



PAPERS

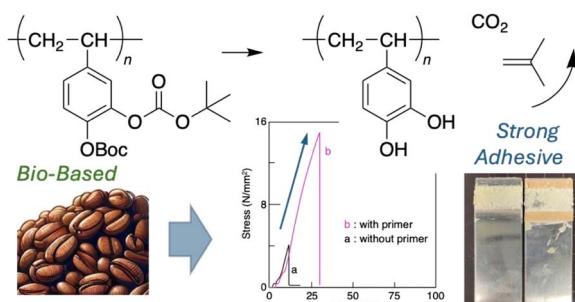
1705



An electrochemically engineered layer of γ -NiOOH with FeOOH on nickel foam for durable OER catalysis for anion exchange membrane water electrolysis

Sreekanth Narayananaru, Hidenori Kuroki, Takanori Tamaki, Gopinathan M. Anilkumar and Takeo Yamaguchi*

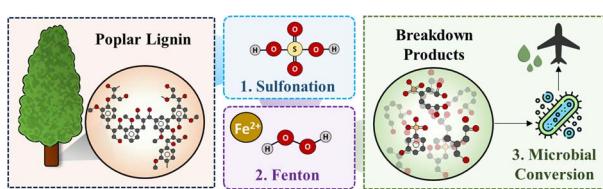
1714



Development of a bio-based adhesive by polymerization of Boc-protected vinyl catechol derived from caffeic acid

Shiho Tanizaki, Tomohiro Kubo, Yosuke Bito, Shigeki Mori, Hiroyuki Aoki and Kotaro Satoh*

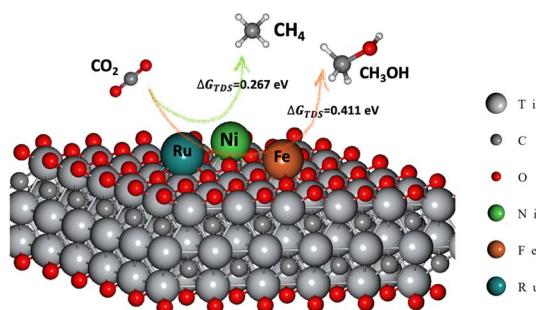
1721



Deconstructing poplar lignin from ionic liquid pretreatment for biological conversion through sulfonation and Fenton chemistry

Daniella V. Martinez, Alberto Rodriguez, Hemant Choudhary, Jay Salinas, Estevan J. Martinez, Oleg Davydovich, Gina M. Geiselman, John M. Gladden, Blake A. Simmons and Michael S. Kent*

1729



A MXene-supported single atom catalyst selectively converts CO_2 into methanol and methane

Hasan Al-Mahayni, Rongyu Yuan and Ali Seifitokaldani*

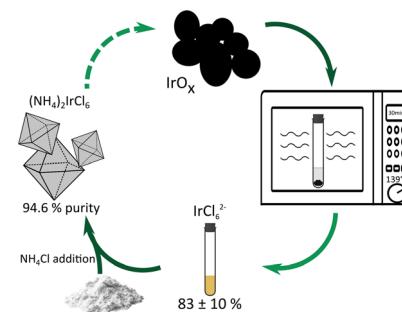


PAPERS

1741

An aqua regia-free chemical recovery and reprecipitation of Ir from IrO_x catalysts: optimisation of the extraction efficiency using surface response methodology

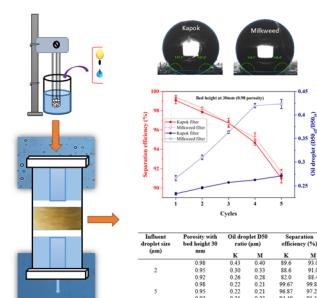
Sarah Turnbull, Delphine Clauss,* Vincent Martin, Jean-Pierre Magnin, Laetitia Dubau and Frédéric Maillard*



1751

Comparative analysis of *Calotropis procera* and *Ceiba pentandra* fibre-based filters used to separate oil from emulsified effluent

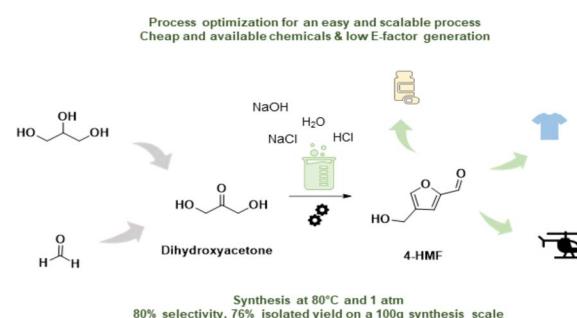
Chandra Jeet Singh,* Samrat Mukhopadhyay, Raju Seenivasan Rengasamy, Mayuri Srivastava and Ranjna Kumari



1762

Green and efficient one-pot synthesis of the bio-based platform molecule 4-hydroxymethyl-2-furfural on a multigram scale

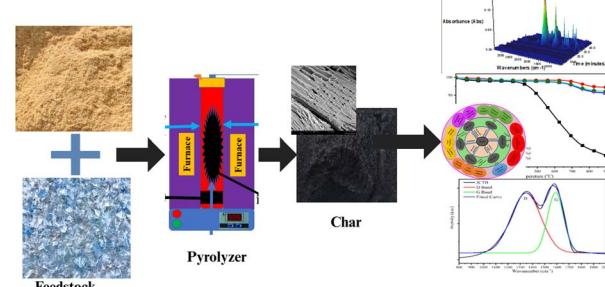
Kubilay Ceyhan, Mattis Rottmann and Harald Gröger*



1774

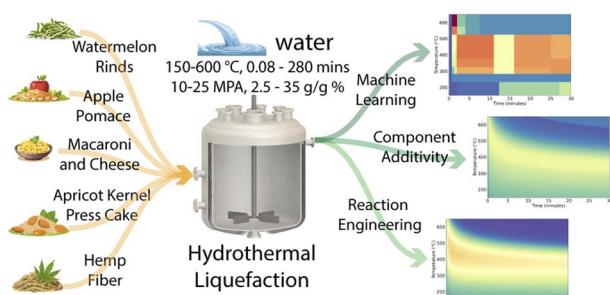
Co-pyrolysis of low-value wood sawdust and non-recyclable plastics into char: effect of plastic loading on char yield and its properties

Ranjeet Kumar Mishra



PAPERS

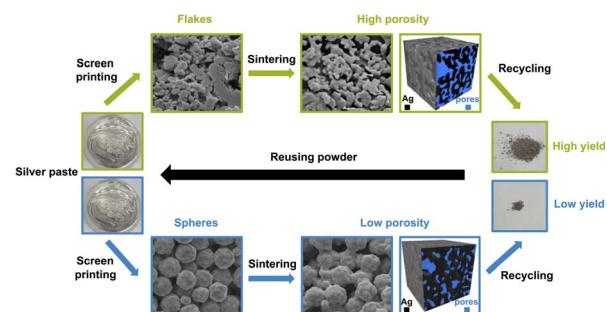
1788



General component additivity, reaction engineering, and machine learning models for hydrothermal liquefaction

Peter M. Guirguis and Phillip E. Savage*

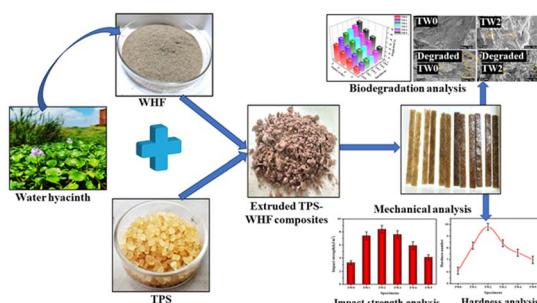
1800



The importance of shape: flakes and spheres in recyclable conductive pastes for printed electronics

David van Impelen, Dominik Perius, Lola González-García* and Tobias Kraus*

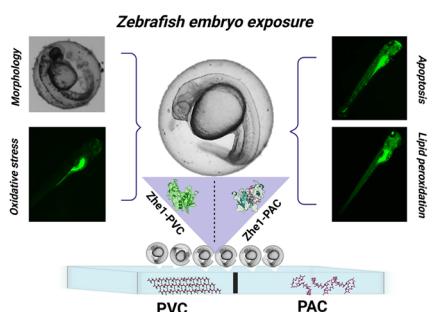
1807



Development and characterization of water hyacinth reinforced thermoplastic starch as sustainable biocomposites

Diptiranjan Behera, Shruti S. Pattnaik, Shubhendu S. Patra, Aruna K. Barick, Jyotsnarani Pradhan and Ajaya K. Behera*

1819



Eco-biocompatible periphyton-inhabited polyvinyl chloride (PVC) and polyacrylic acid (PAC) sheets indicate aquaculture bio-sustainability by oxidative stress and steatosis in zebrafish

Mitali Sahoo, Snehasmita Jena, Shaikh Sheeran Naser, Sudakshya S. Lenka, Adrija Sinha, Aishee Ghosh, Ch. Vinod* and Suresh K. Verma*

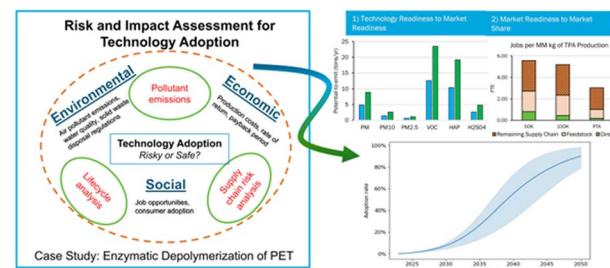


PAPERS

1830

Addressing adoption barriers and accelerating market deployment of new technologies

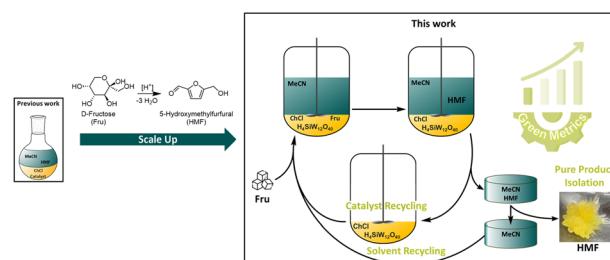
Greg Avery,* Arpit Bhatt,* Shubhankar Upasani, Julien Walzberg, Andre Fernandes Tomon Avelino, Jason DesVeaux, John Minh Quang Pham and Alberta Carpenter



1848

5-Hydroxymethylfurfural (HMF) synthesis in a deep eutectic solvent-based biphasic system: closing the loop of solvent reuse, product isolation and green metrics

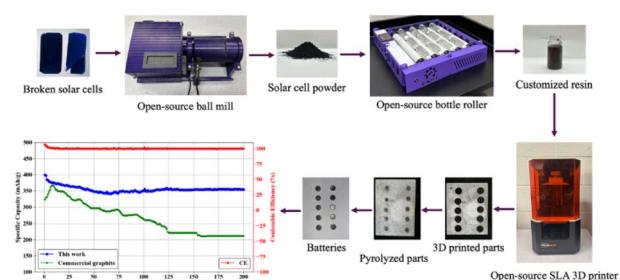
Nico Thanheuser, Leonie Schlichter, Walter Leitner, Jesús Esteban* and Andreas J. Vorholt*



1859

Recycling silicon photovoltaic cells into silicon anodes for Li-ion batteries using 3D printing

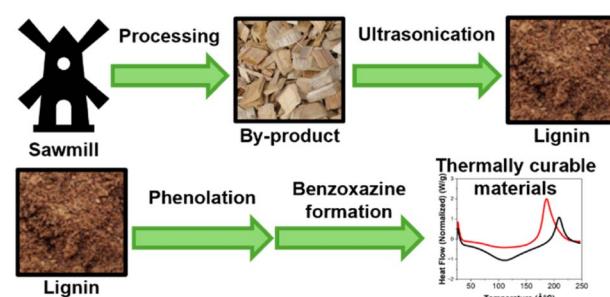
Maryam Mottaghi,* Apoorv Kulkarni and Joshua M. Pearce



1870

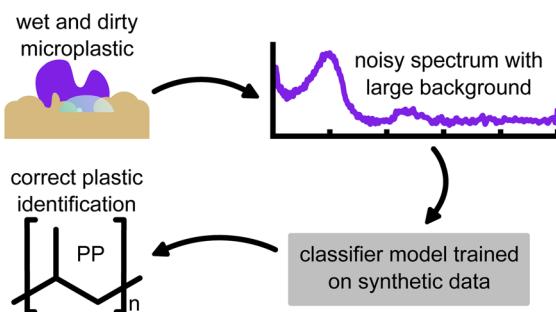
Preparation of thermally curable materials using lignin extracted from sawmill co-product

Libby J. Marshall, Daniel J. Cheney, Jasmine A. Keith, Christopher Kelly, Frédéric Blanc, Andrew J. West and Dave J. Adams*



PAPERS

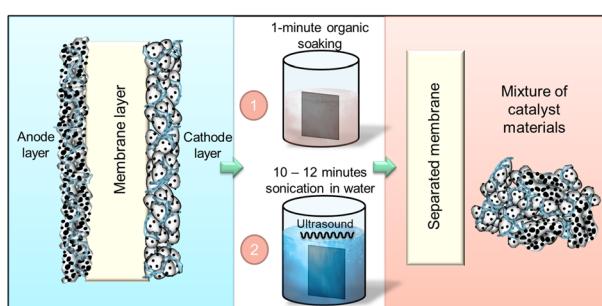
1886



Microplastics in the rough: using data augmentation to identify plastics contaminated by water and plant matter

Joseph C. Shirley, Kobiny Antony Rex, Hassan Iqbal, Christian G. Claudel and Carlos R. Baiz*

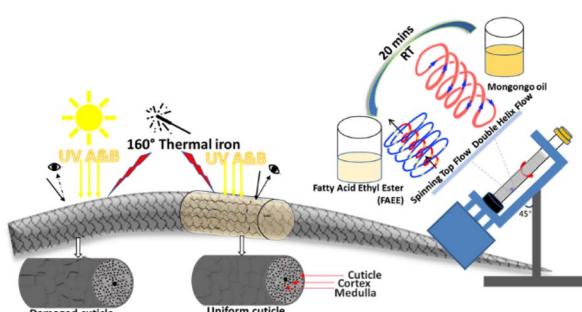
1900



Catalyst coated membranes for fuel cell and water electrolyser delamination induced by organic solution soaking and water ultrasonication

Tanongsak Yingnakorn, Jennifer Hartley, Molly E. Keal, Ross Gordon, Daniel Marin Florido, Andrew P. Abbott and Jake M. Yang*

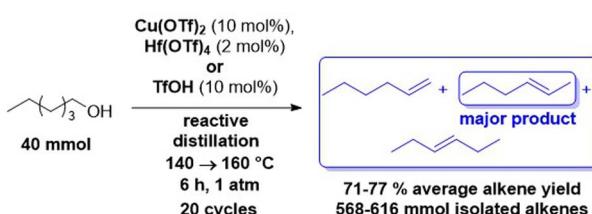
1909



Vortex fluidic-mediated transesterification enhancement of mongongo fatty acid ethyl ester production for haircare applications

Xuejiao Cao, Xuan Luo, Safira M. Barros, Wenjin Xing, Melanie MacGregor, Iliana Delcheva, Jonathan A. Campbell, Shan He, Bradley P. Kirk, Youhong Tang and Colin L. Raston*

1923



Reusability studies with Lewis and Brønsted acid catalysts for dehydration of the primary alcohol 1-hexanol under energy-saving conditions

Adil Allahverdiyev and Harald Gröger*

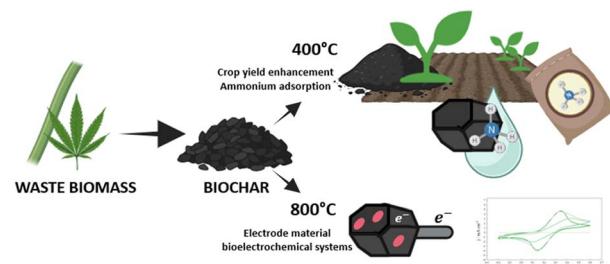


PAPERS

1932

Cannabis sativa biochar: characterization and preliminary application in plant growth and adsorption, and as an electrode material

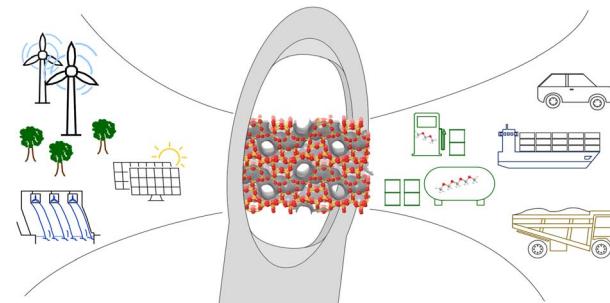
Maria Belen Ceretta, Sofia Antic Gorrazzi, Sebastian D'Ippolito, Julieta Mendieta, Debora Nercessian and Sebastian Bonanni*



1941

Production of oxymethylene ethers (OME) as sustainable diesel fuel substitutes: continuous synthesis from dimethyl ether and trioxane and evaluation of catalyst stability

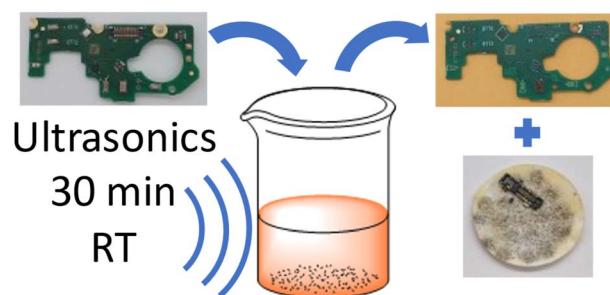
Marius Drexler, Victor Zaghini Francesconi, Ulrich Arnold,* Thomas A. Zevaco and Jörg Sauer



1957

Critical metal recovery from e-waste in concentrated ionic media using ultrasound

Christopher E. Elgar,* Kelsey Hall and Andrew P. Abbott



1966

A high-performance nanofiltration membrane synthesized by embedding amino acids and ionic liquids in cellulose acetate for heavy metal separation

D. Teja Nayak, Vinoth Kumar Raja, G. Arthanareeswaran,* Tran Dang Khoa and Wirach Taweeprada

