

Sustainable Energy & Fuels

Interdisciplinary research for the development of sustainable energy technologies

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Cover
See Kenji Miyatake et al., pp. 4882–4888. Image reproduced by permission of Kenji Miyatake from *Sustainable Energy Fuels*, 2025, 9, 4882.

EDITORIAL

4773

Introduction to the metal-free photo/electrocatalysts for sustainable energy solutions themed collection

Reiner Sebastian Sprick,* Menny Shalom* and Xinchun Wang*

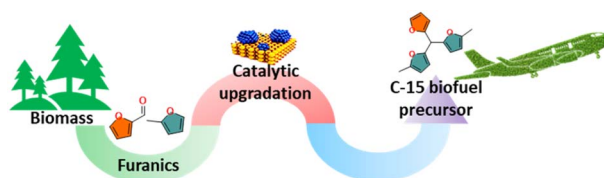


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Renewable furfural and 2-methylfuran valorization: catalytic routes for the production of sustainable aviation C-15 fuel precursors

Arvind Singh Chauhan,* Omvir Singh and Pralay Das



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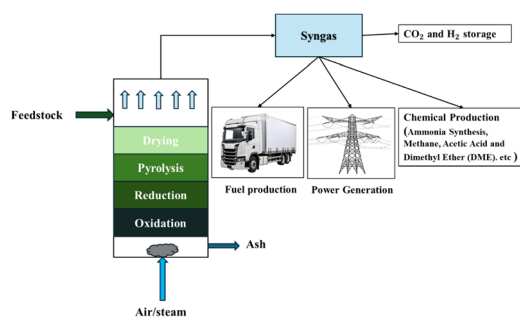
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REVIEWS

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Advancements in gasification technologies: insights into modeling studies, power-to-X applications and sustainability assessments

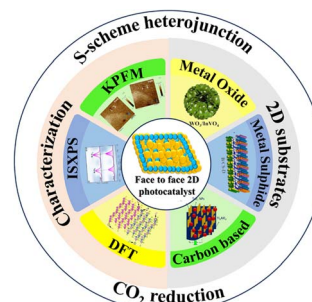
Sonu Kumar,* Rupesh Palange and Cataldo De Blasio



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Flat meets functional: face-to-face 2D/2D S-scheme photocatalysts for efficient CO₂-to-fuel conversion

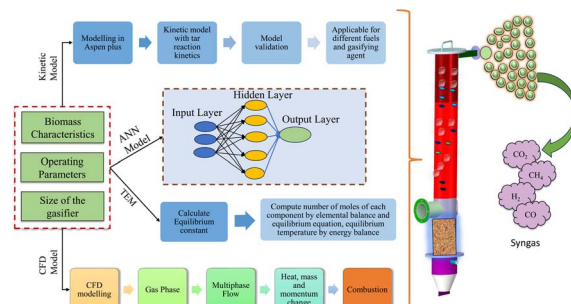
Parul Rana, Pardeep Singh, Vanita Puri, Quyet Van Le, Tansir Ahamad, Thi Thu Le, Van-Huy Nguyen* and Pankaj Raizada*



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Recent advances and computational approaches in biomass gasifier modeling: from thermodynamics to AI-driven techniques

Raj Kumar,* Narayan Lal Panwar, Vinod Kumar, Manjeet Singh, Sanwal Singh Meena and Kalpana Jain

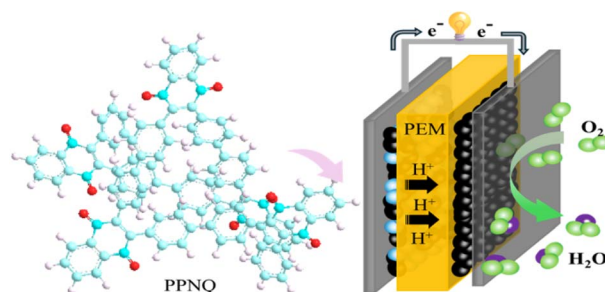


COMMUNICATIONS

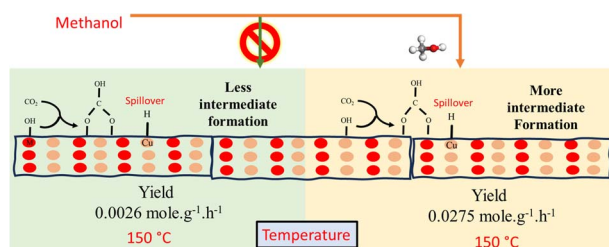
4882

Enhanced performance of all-solid-state rechargeable air batteries with a redox-active naphthoquinone-based polymer electrode

Lin Guo, Kenji Miyatake,* Fang Xian, Fanghua Liu, Ahmed Mohamed Ahmed Mahmoud, Vikrant Yadav and Chun Yik Wong



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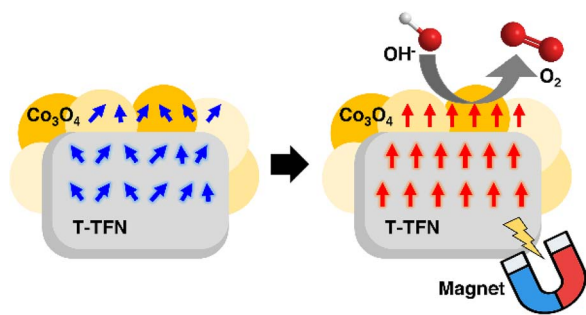


Low-temperature methanol-assisted CO₂ hydrogenation populates intermediates over a Ce-promoted Cu/ZnO/MgO catalyst in a three-phase slurry reactor

Vaibhav Pandey, Priyanshu Pratap Singh, Aakash Bhardwaj, Kamal Kishore Pant,* Sreedevi Upadhyayula* and Siddhartha Sengupta

PAPERS

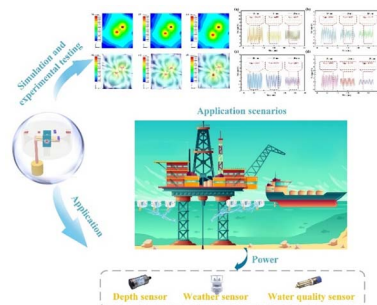
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Ferromagnetic–antiferromagnetic interfaces in MAX phase electrocatalysts: a spin-driven platform for enhanced oxygen evolution reaction

Deepak Vishnu S. K., Chih-Ying Huang, Cheng-Rong Wu, Bo-Yan Lin, Chia-Chun Chen, Huang-Ming Tsai, Jau-Wern Chiou, Raman Sankar,* Tsyng-Yan Yu,* Chi-Kung Ni,* Way-Fang Pong and Chun-Wei Chen*

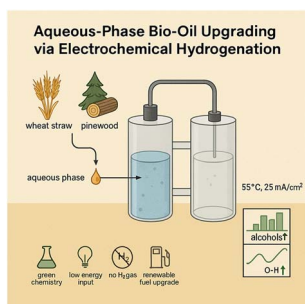
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A dual system piezoelectric energy harvester for harvesting low frequency ocean energy

Chensheng Wang, Xuesen Yuan, Luyang Tan, Zhenheng Li, Shuangjian Wang and Lipeng He*

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Pinewood and wheat straw bio-oil aqueous phase electrochemical hydrogenation utilising a PtRu/ACC catalyst

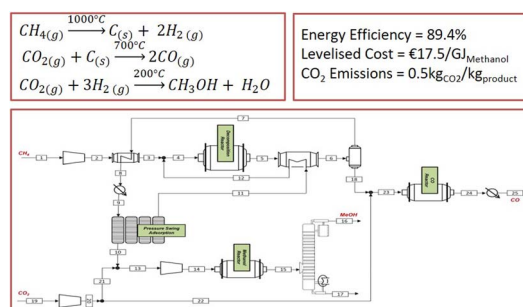
Cesar Catizane,* Ying Jiang, Scott Banks and Joy Sumner*



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Methanol and carbon monoxide co-production via methane decomposition: techno-economic and environmental analysis

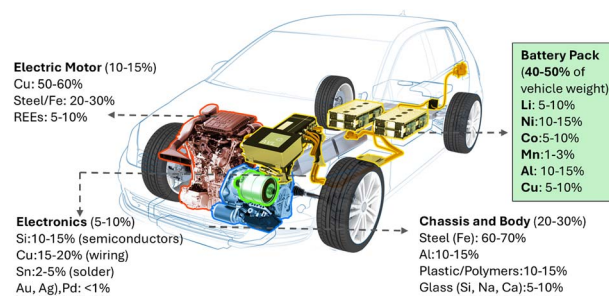
Aaditya Pandey, Farzeena Parayil Ayubkhan, Niharika Mylipilli, Amisha Thotakura and Navid Khallaghi*



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Material feasibility and environmental impacts of critical metals in NMC cathodes under a sustainable framework for electric vehicles

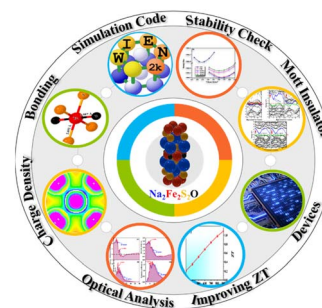
Nidhi Pandey, Gopa Nandikes, Pankaj Pathak,* Sadia Ilyas* and Rajiv Ranjan Srivastava*



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Unveiling Na₂Fe₂S₂O oxychalcogenide: a high-performance thermoelectric and optoelectronic material for sustainable energy conversion

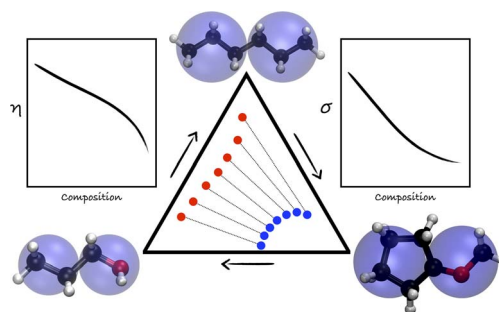
Muhammad Haseeb,* Muhammad Kashif Bashir, Athar Javed, Asma Munir, Muhammad Amir Rafiq and Altaf Hussain*



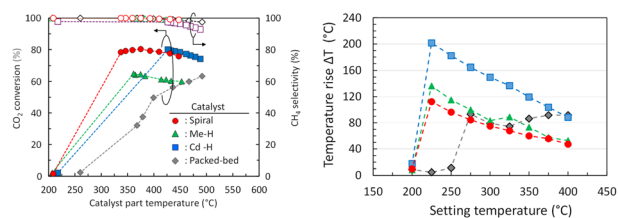
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Toward sustainable fuel formulations: thermophysical assessment of a synthetic oxygenated blend formed from hexane + cyclopentyl methyl ether + propan-1-ol

Isaías Huenuvil-Pacheco, Marcela Cartes and Andrés Mejía*



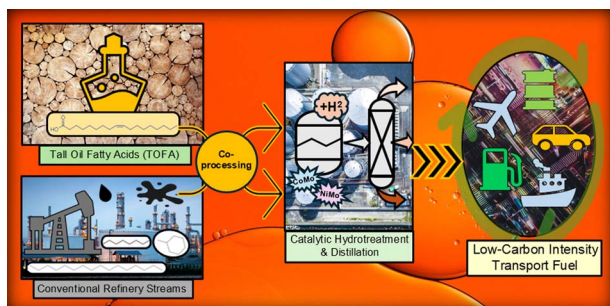
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Enhanced thermal management in CO₂ methanation using spiral-structured catalysts: a comparative study with honeycomb, monolith, and packed-bed systems

Ryo Watanabe,* Shota Ueda, Hiroshi Akama, Kazuhide Mino and Choji Fukuhara*

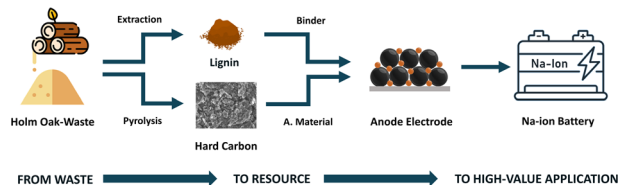
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Fractionation and catalytic upgradation of crude tall oil into sustainable transportation fuels via blending and co-refining

J. G. B. Churchill, G. K. Rath, V. B. Borugadda and A. K. Dalai*

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A sustainable anode for Na-ion batteries based on holm oak waste-derived hard carbon and lignin binder

Luca Bottoni,* Hamideh Darjazi, Leonardo Sbrascini, Antunes Staffolani, Genny Pastore, Luca Minnetti, Federico Verdicchio, Serena Gabrielli, Andrea Catorci and Francesco Nobili

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A vanillin bio-based redox polymer as a cathode material for lithium organic batteries

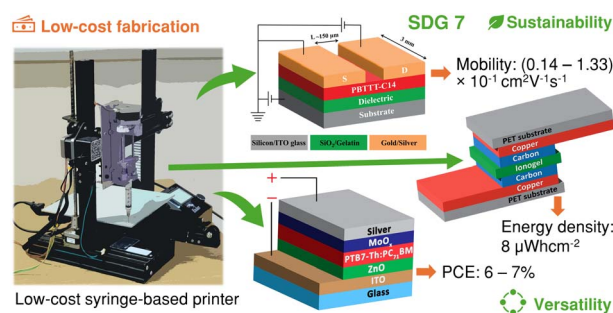
Tijs Lap, Gabriele Lingua, Daniele Mantione and David Mecerreyes*



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Wider manifestation of low-cost syringe-based printer for realizing printed organic electronic devices and supercapacitors

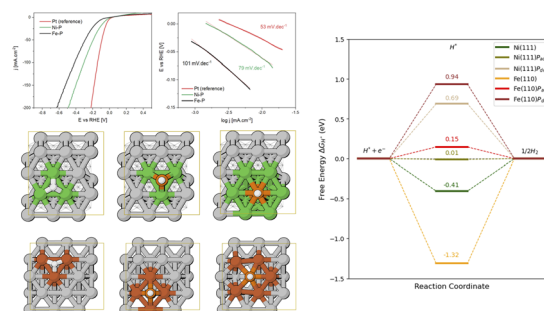
Donjo George, Aman Khatkar, Vamsi Krishna G, Lubna Khanam, Yogesh Yadav, Ramesh Gupta Burela and Samarendra Pratap Singh*



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Experimental and computational analysis of Ni–P and Fe–P metal foams for enhanced hydrogen evolution reaction in alkaline media

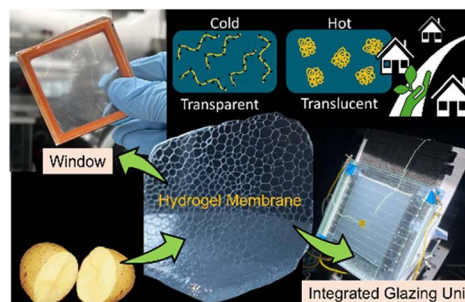
Natália Podrojková, Alexandra Gubóová, Magdalena Streckova, František Kromka and Renáta Oriňaková*



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Enhancing thermal comfort and photovoltaic efficiency through thermotropic starch–hydrogel composite membrane integration in sustainable building fenestration

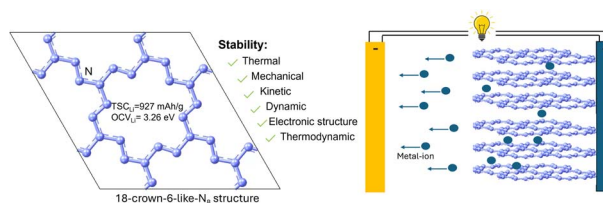
Anurag Roy,* Adeel Arshad, Tapas Kumar Mallick and Asif Ali Tahir*

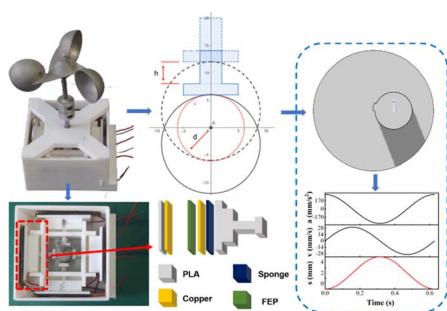


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A DFT study on an 18-crown-6-like-N₈ structure as a material for metal ion storage: stability and performance

Irina I. Piyanzina,* Regina M. Burganova, Sadeqh Kaviani, Oleg V. Nedopekin and Hayk Zakaryan





3D-printed rotary triboelectric nanogenerators based on a cam-drive structure for wind energy harvesting

Shuyue You, Wei Zhao, Lisheng Du, Junyang Ma, Yaxiong Qin, Kun Du, Dan Zhao and Bo Zhang*

