

# Sustainable Energy & Fuels

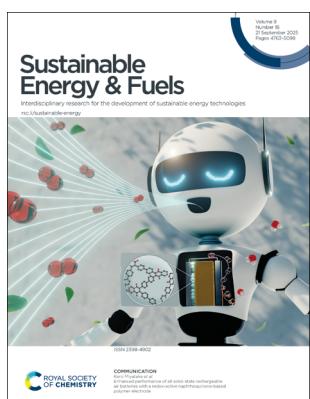
Interdisciplinary research for the development of sustainable energy technologies

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ISSN 2398-4902 CODEN SEFUA7 9(18) 4763–5098 (2025)



### Cover

See Kenji Miyatake et al.,  
pp. 4882–4888. Image  
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Kenji Miyatake from  
*Sustainable Energy Fuels*,  
2025, **9**, 4882.

## EDITORIAL

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

Reiner Sebastian Sprick,\* Menny Shalom\*  
and Xinchen Wang\*

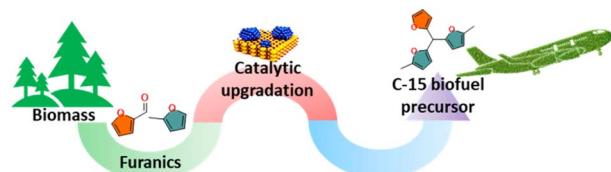


## REVIEWS

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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



# EES Batteries

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batteries and energy storage**

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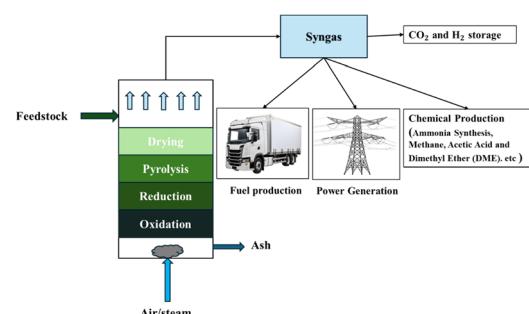
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## REVIEWS

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

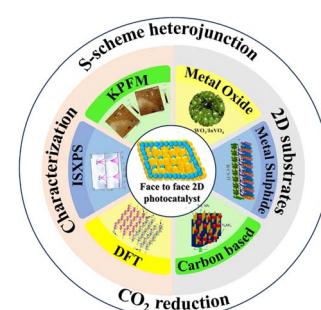
Sonu Kumar,\* Rupesh Palange and Cataldo De Blasio



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

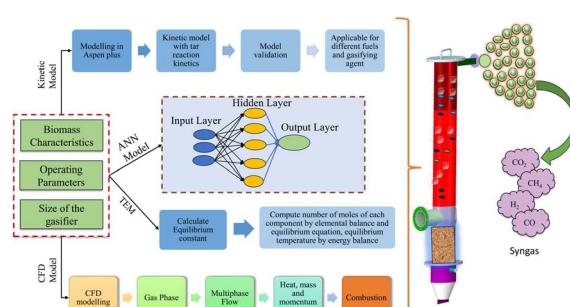
Parul Rana, Pardeep Singh, Vanita Puri, Quyet Van Le, Tansir Ahamad, Thi Thu Le, Van-Huy Nguyen,\* and Pankaj Raizada\*



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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

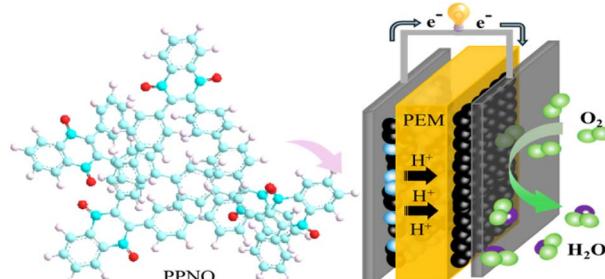


## COMMUNICATIONS

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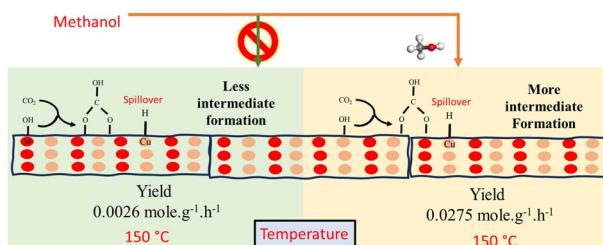
**Enhanced performance of all-solid-state rechargeable air batteries with a redox-active naphthoquinone-based polymer electrode**

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



## COMMUNICATIONS

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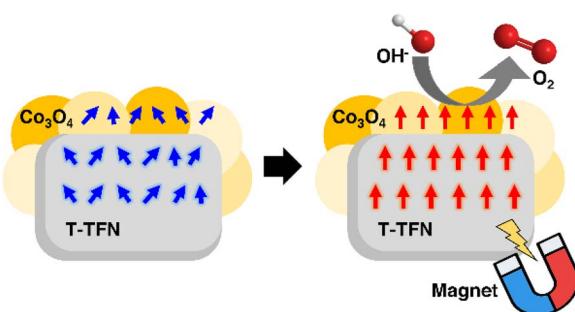


**Low-temperature methanol-assisted  $\text{CO}_2$  hydrogenation populates intermediates over a Ce-promoted Cu/ZnO/MgO catalyst in a three-phase slurry reactor**

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

## PAPERS

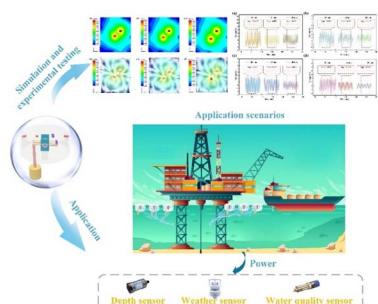
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**Ferromagnetic–antiferromagnetic interfaces in MAX phase electrocatalysts: a spin-driven platform for enhanced oxygen evolution reaction**

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

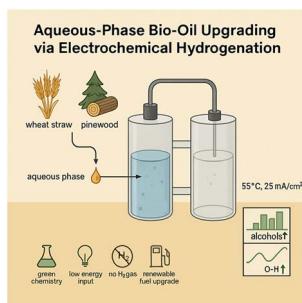
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**A dual system piezoelectric energy harvester for harvesting low frequency ocean energy**

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\*

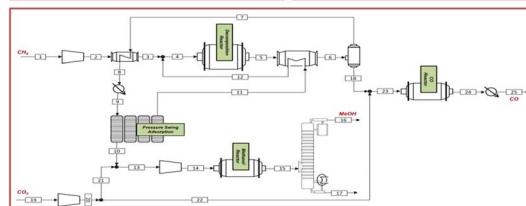
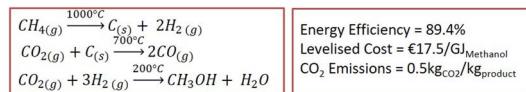


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# Methanol and carbon monoxide co-production via methane decomposition: techno-economic and environmental analysis

Aaditya Pandey, Farzeena Parayil Ayubkhan,  
Niharika Mylipilli, Amisha Thotakura and Navid Khalagh\*  
(\*

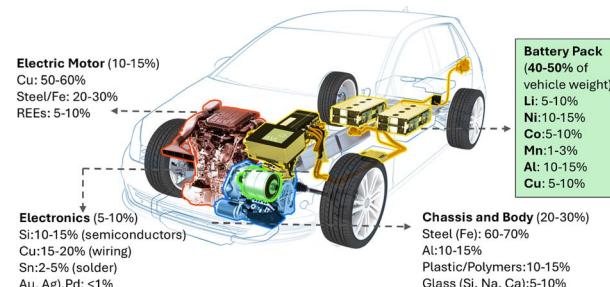


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# Material feasibility and environmental impacts of critical metals in NMC cathodes under a sustainable framework for electric vehicles

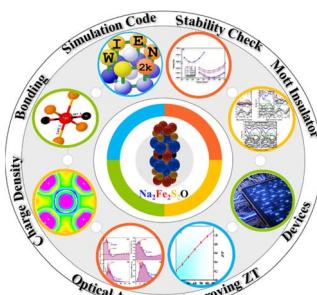
Nidhi Pandey, Gopa Nandikes, Pankaj Pathak,\* Sadia Ilyas\*  
and Rajiv Ranjan Srivastava\*



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# Unveiling $\text{Na}_2\text{Fe}_2\text{S}_2\text{O}$ oxychalcogenide: a high-performance thermoelectric and optoelectronic material for sustainable energy conversion

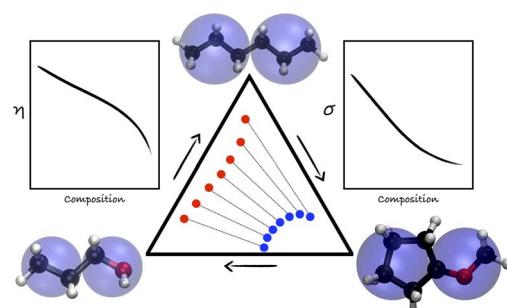
Muhammad Haseeb,\* Muhammad Kashif Bashir, Athar Javed, Asma Munir, Muhammad Amir Rafiq and Altaf Hussain\*



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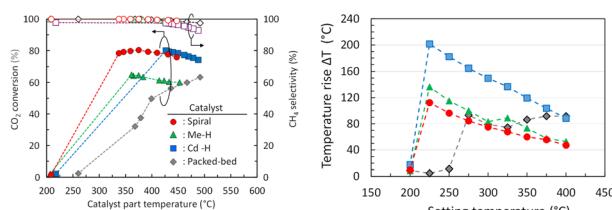
# Toward sustainable fuel formulations: thermophysical assessment of a synthetic oxygenated blend formed from hexane + cyclopentyl methyl ether + propan-1-ol

Isaías Huenuvil-Pacheco, Marcela Cartes  
and Andrés Mejía\*



## PAPERS

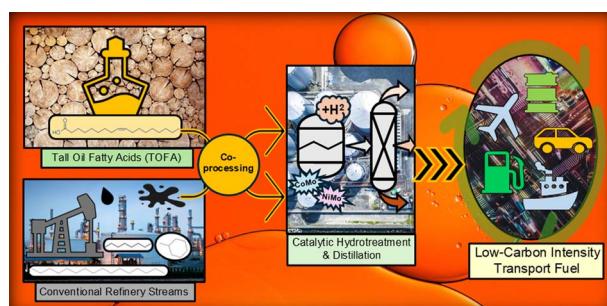
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## Enhanced thermal management in $\text{CO}_2$ methanation using spiral-structured catalysts: a comparative study with honeycomb, monolith, and packed-bed systems

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\*

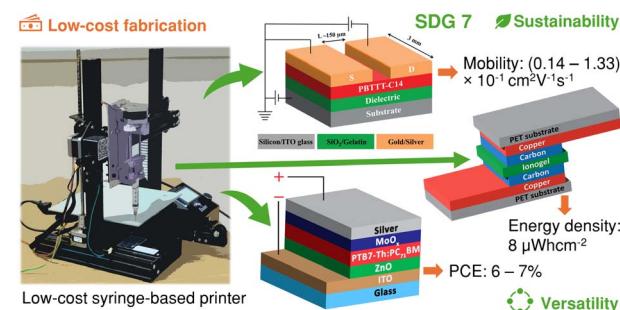


## PAPERS

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

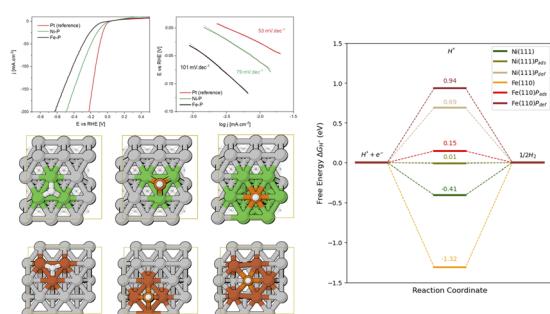
Donjo George, Aman Khatkar, Vamsi Krishna G, Lubna Khanam, Yogesh Yadav, Ramesh Gupta Burela and Samarendra Pratap Singh\*



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

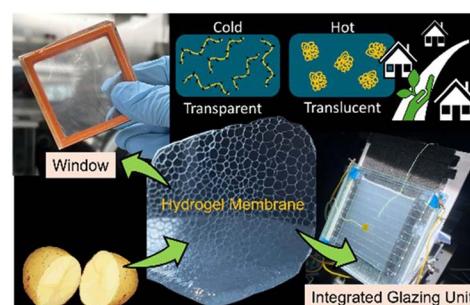
Natália Podrojčková, Alexandra Gubóová, Magdalena Strecková, František Kromka and Renáta Oriňáková\*



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

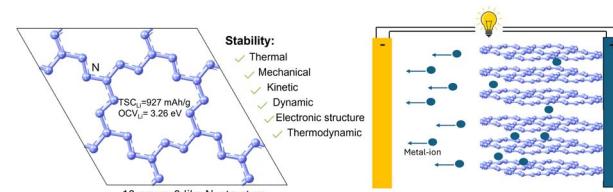
Anurag Roy,\* Adeel Arshad, Tapas Kumar Mallick and Asif Ali Tahir\*



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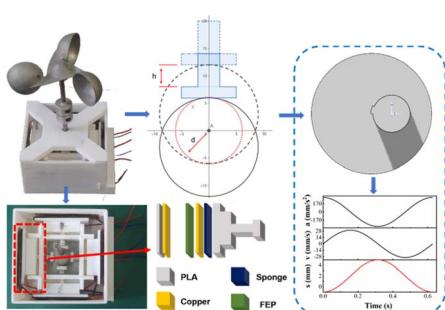
## A DFT study on an 18-crown-6-like-N<sub>8</sub> structure as a material for metal ion storage: stability and performance

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



## PAPERS

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**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\*

