

# RSC Sustainability

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## IN THIS ISSUE

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**Cover**  
See Yumiko Takagi and Toshiyuki Itoh, pp. 2750–2778. Image reproduced by permission of Yumiko Takagi and Toshiyuki Itoh from *RSC Sustainability*, 2025, 3, 2750.



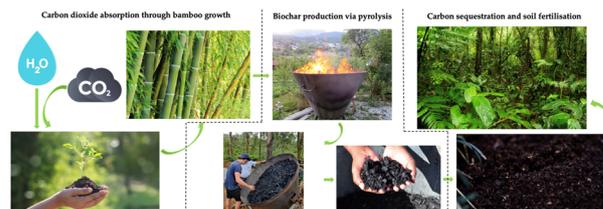
**Inside cover**  
See Chunlin Xu, Johan Bobacka *et al.*, pp. 2883–2898. Image reproduced by permission of Angelo Robiños from *RSC Sustainability*, 2025, 3, 2883.

## CRITICAL REVIEWS

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### From bamboo to biochar: a critical review of bamboo pyrolysis conditions and products with a focus on relevance to the developing world

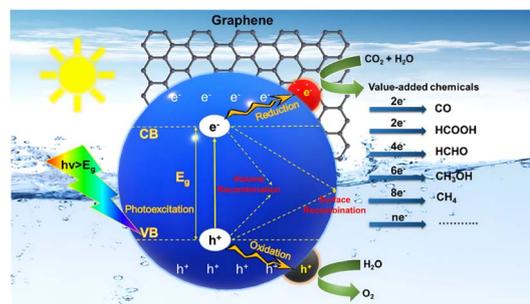
Elish Chambers, Matthew Hassall, Dominic Johnson, Conall Mcgoran, Olivia Williams, Aden Blair, Freddie Catlow and Basudeb Saha\*



2733

### Unlocking the carbon dioxide photoreduction potential of graphene-derived catalysts: mechanisms, product selectivity, and challenges

Manisha Sain, Debanjali Dey, Ramkrishna Sen and Shamik Chowdhury\*



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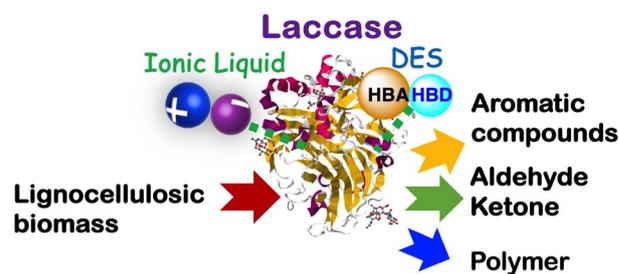
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## TUTORIAL REVIEWS

2750

### Advancing laccase-catalysed depolymerisation of lignocellulosic biomass with the help of ionic liquids or deep eutectic solvents

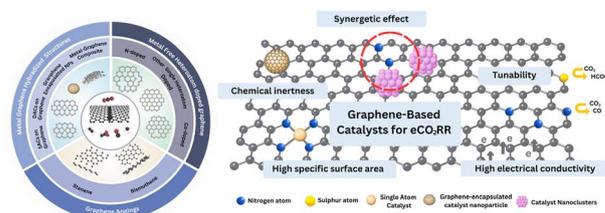
Yumiko Takagi and Toshiyuki Itoh\*



2779

### Graphene-based catalysts for electrochemical CO<sub>2</sub> reduction reaction

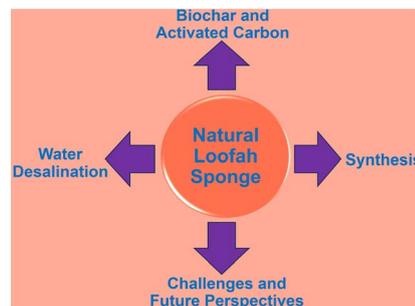
Lankamullage Hasini Amanda Wijewardena, Woo Seok Cheon, Seol-Ha Jeong,\* Jungwon Park\* and Ho Won Jang\*



2806

### Loofah sponge: a sustainable material for wastewater desalination

Susmi Anna Thomas,\* Jayesh Cherusseri\* and Deepthi N. Rajendran\*

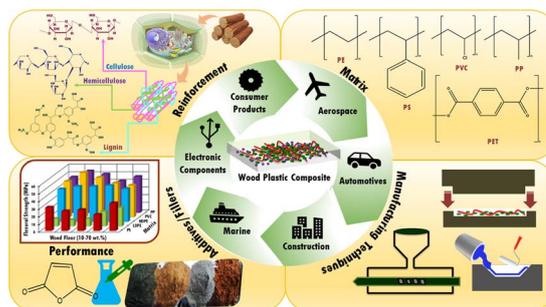


## PERSPECTIVES

2833

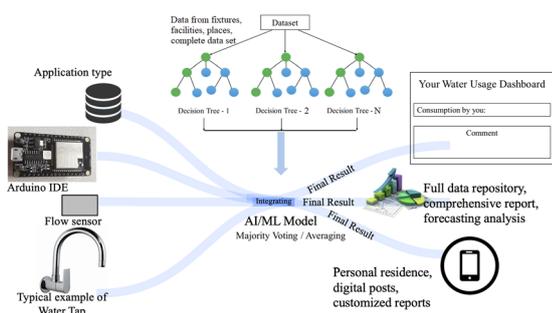
### Towards sustainable wood–plastic composites: polymer types, properties, processing and future prospects

Anam Khan, Alka Mishra, Vijay Kumar Thakur and Asokan Pappu\*



## PERSPECTIVES

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### A sustainable future: the impact of real-time feedback systems on water conservation efforts

Manoj Kumar Jindal,\* Pradip Kumar Tewari, Vikky Anand\* and Uthukotasriram Abhishek

## COMMUNICATIONS

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Chemicals	Amount	Grade	Activity
Surfactant	✗	✗	
HAuCl <sub>4</sub>	0.5 mM	-	
NaOH	2 mM	+/-	
Ethanol	20 v.%	-	
H <sub>2</sub> O	80 v.%	+/-	
Temperature	RT		

### Surfactant-free gold nanoparticles synthesized in alkaline water–ethanol mixtures: leveraging lower grade chemicals for size control of active nanocatalysts

Frederik Jæger, Albert Abildtrup Pedersen, Peter Stensgaard Wachterhausen, Aleksandra Smolska and Jonathan Quinson\*

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Ethanol	[Ethanol + Glycerol]	Glycerol
Low viscosity	Low viscosity	High viscosity
2-10 v.%	18 v.% + 2 v.% 8 v.% + 2 v.% 3 v.% + 2 v.%	20 v.% 2-10 v.%
✗		+/-

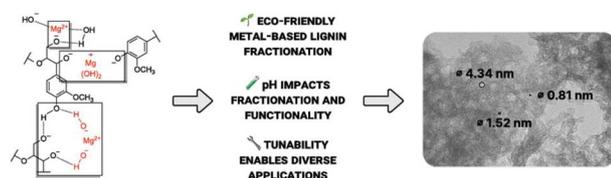
### Less chemicals for more controlled syntheses: on the benefits of mixtures of alcohols for room temperature surfactant-free colloidal syntheses of gold nanoparticles

Julie Christine Hamer Larsen, Astrid Nymann Porsgaard, Leander Vinding, Aleksandra Smolska and Jonathan Quinson\*

## PAPERS

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### INTEGRATED FRACTIONATION AND TEMPLATING OF LIGNIN



### Integrated fractionation and templating of lignin using magnesium for sustainable and tailored porous carbon

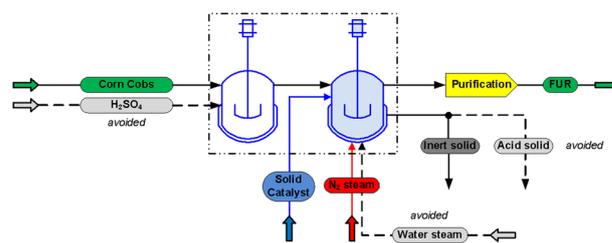
Angelo Robiños, Hao Zhang, Zekra Mousavi, Tor Laurén, Jan-Henrik Småtå, Leena Hupa, Chunlin Xu\* and Johan Bobacka\*



2899

### Towards greener furfural: evaluating the technical, economic and environmental feasibility of heterogeneous catalysis in biomass conversion

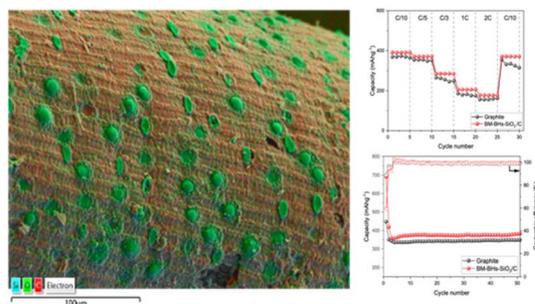
Jorge Blanco-Cejas,\* Ion Agirre,\* Inaki Gandarias, Jovita Moreno and Jose Iglesias



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### From waste to power: utilizing barley husk as a sustainable anode active material alternative to graphite in lithium-ion batteries

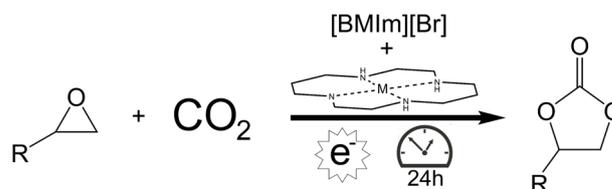
Chenghao Yue, Alireza Fereydooni, Puritut Nakhanej, Maria Balart Murria, Mingrui Liu, Yuexi Zeng, Zhijie Wei, Qiuju Fu, Xuebo Zhao, Melanie J. Loveridge and Yimin Chao\*



2927

### Integrated experimental and theoretical insights into CO<sub>2</sub> fixation: tetraazamacrocyclic catalysts in ionic liquids for cyclic carbonate formation

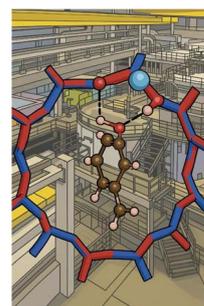
Jessica Honores,\* Diego Quezada, Maria B. Camarada, Galo Ramirez and Mauricio Isaacs\*



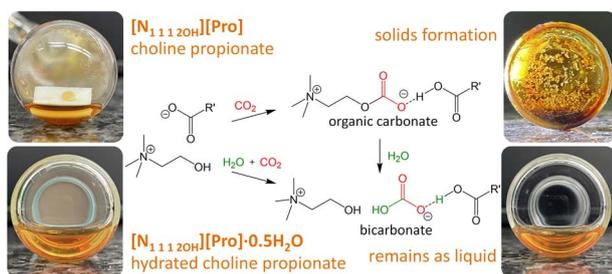
2938

### Probing adsorption interactions of lignin derivatives in industrial zeolite catalysts through combining vibrational spectroscopy and *ab initio* calculations

K. S. C. Morton, A. J. O. Malley\* and J. Armstrong\*



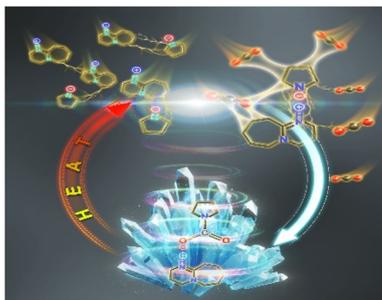
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### CO<sub>2</sub> capture by carboxylate ionic liquids: fine-tuning the performance by altering hydrogen bonding motifs

Mohammad Yousefe, Katarzyna Glińska, Michael Sweeney, Leila Moura, Matgorzata Swadźba-Kwaśny and Alberto Puga\*

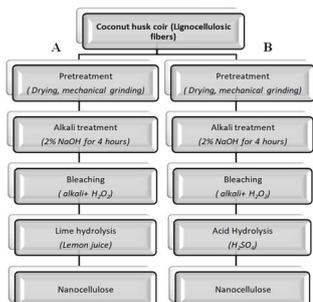
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### Efficient capture of carbon dioxide to form organic crystals at low pressure and room temperature

Shangzhong Zhang and Lifeng Yan\*

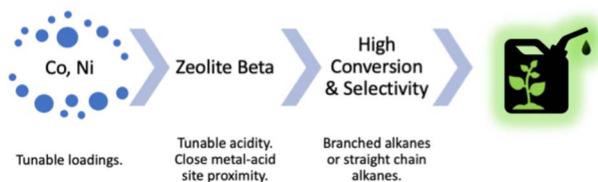
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### Upcycling coconut husk coir by extraction of cellulose nanofibrils using green citric acid from lemon juice

Navdeep Kaur, Parul Chandel, Antonio J. Capezza, Annu Pandey, Richard T. Olsson\* and Nibedita Banik\*

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### Bifunctionality of supported metal hydrodeoxygenation catalysts

Raiven I. Balderas, Logan Myers, Jacob Miller, Cody J. Wrasman, Derek Vardon and Ryan M. Richards\*



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## Unveiling the environmental costs of lignocellulosic film production with ionic liquids: the case of 1-ethyl-3-methylimidazolium acetate

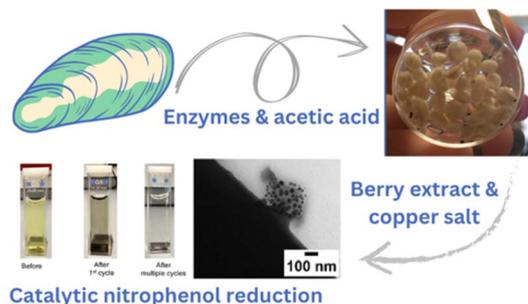
Diego Freire Ordóñez,\* Antonella Rozaria Nefeli Pontillo, Niall Mac Dowell, Tom Welton and Koon-Yang Lee\*



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## Modification of calcium carbonate from blue mussel shells with copper oxide nanoparticles

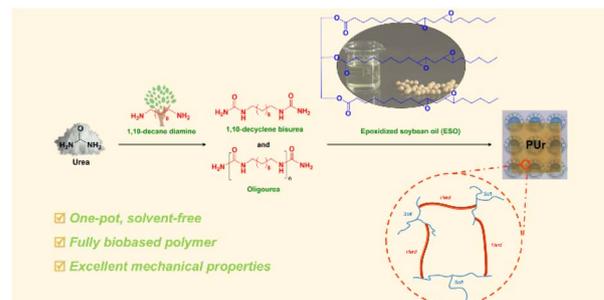
Sachel Christian-Robinson, Fanqi Kong, E. Bradley Easton and Francesca M. Kerton\*



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## One-pot synthesis of fully biobased polyureas with excellent mechanical properties from epoxidized soybean oil

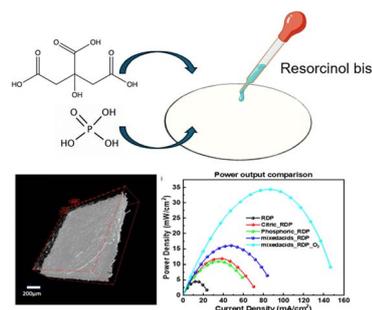
Lei Zhang and Donglin Tang\*



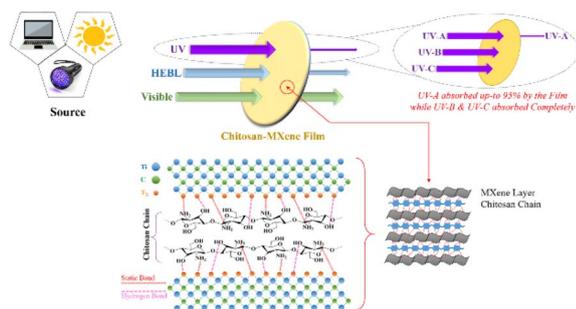
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## Designing a micro-cellulose membrane for hydrogen fuel cells

Aniket Raut, Haoyan Fang, Yu-Chung Lin, Md Farabi Rahman, Shi Fu, Yifan Yin, Yiwei Fang, David Sprouster, Rebecca Isseroff, Sunil K. Sharma, Priyanka Sharma, Devanshi Bhardwaj, Mounesha N. Garega, Steve Greenbaum, Sheng Zhang and Miriam Rafailovich\*



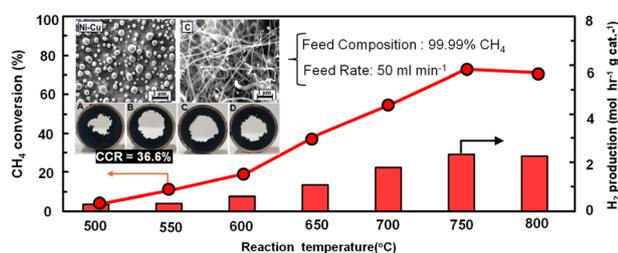
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### Transparent and flexible MXene-chitosan nanocomposite film for effective UV and high-energy blue light shielding applications

Md. Hanif Munshi, Md. Didarul Islam, M. Mehedi Hasan, Md Nasiruddin, S. M. Fazle Rabbi, Shaikh Almoon Hussain and Md. Kamruzzaman\*

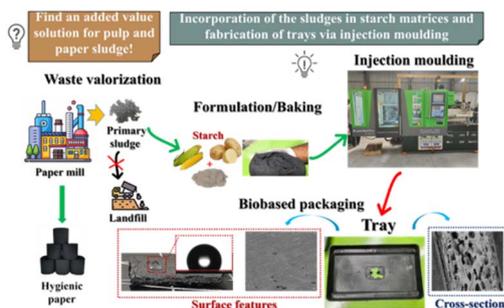
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### Methane decomposition using a Ni–Cu-based hollow-wall-structured catalyst prepared by combined electroless plating

Prithvi Rasaili, Ryo Watanabe,\* Hiroshi Akama and Choji Fukuhara\*

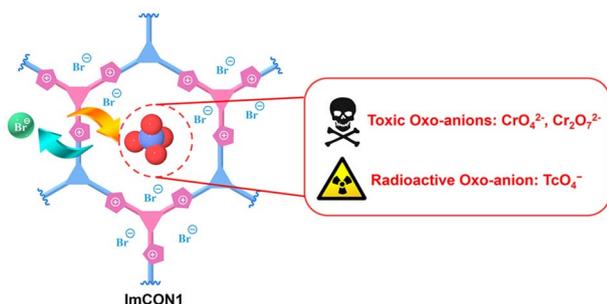
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### Sustainable packaging solutions: harnessing primary sludge cellulosic fibres in foamed starch materials via injection moulding

Susana C. Pinto,\* Bernardo Graça, Vasco G. Lopes and Dmitry. V. Evtugin\*

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### A novel cationic organic network for ultra-fast and high-capacity removal of toxic oxo-anions from water

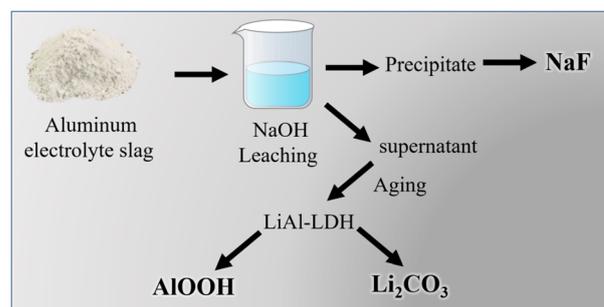
Yi-Shou Wang,\* Xin-Yu Li, Rui-Rui Li, Xiao-Nan Yuan, Zhu-Qing Zhao and Xing-Xing Gou



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### Recovery of valuable metals from lithium-containing aluminum electrolyte slag *via* an NaOH leaching-aging-water leaching process

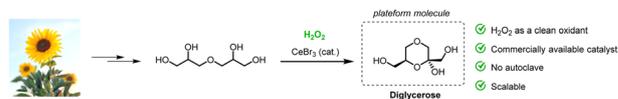
Ting Zhou, Chenyu Zhang, Rui Xu, Sha Luo,\* Wenzhang Li and Yang Liu\*



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### Oxidation of diglycerol to diglycerose using hydrogen peroxide as a clean oxidant

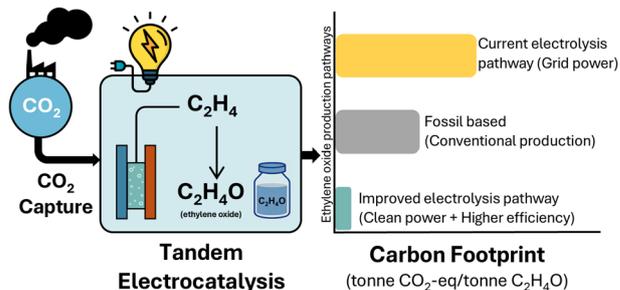
Yanfang Qin, Huan Wang, Estelle Métay\* and Nicolas Duguet\*



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### Carbon footprint assessment of ethylene oxide production *via* CO<sub>2</sub> electrolysis

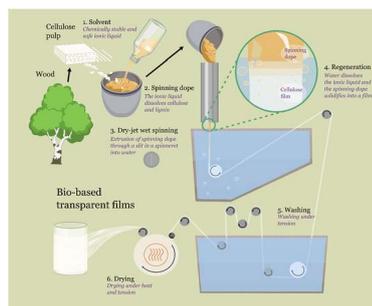
Angel Badewole,\* Jianan Erick Huang, Edward H. Sargent, Bradley A. Saville and Heather L. MacLean\*



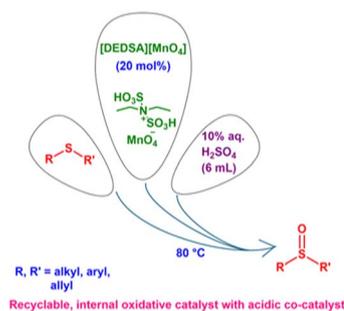
3109

### Semi-continuous, industrial-like production of transparent cellulose films by means of the Lyocell-type Ioncell® process

Eva González Carmona, Inge Schlapp-Hackl, Kaarlo Nieminen, Wenwen Fang, Seppo Jääskeläinen, Kalle Salonen, Hannes Elmer, Helena Westerback, Herbert Sixta and Michael Hummel\*



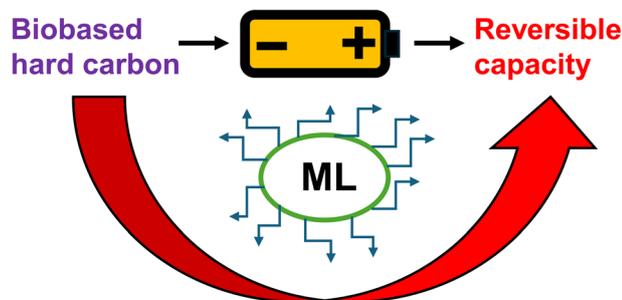
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### Investigation of a sulfonic acid functionalized ammonium-based permanganate hybrid as a sustainable oxidative catalyst for selective conversion of organic sulfides to sulfoxides

Sangeeta Kalita, Niharika Kashyap, Prapti Priyam Handique, Debanga Bhusan Bora and Ruli Borah\*

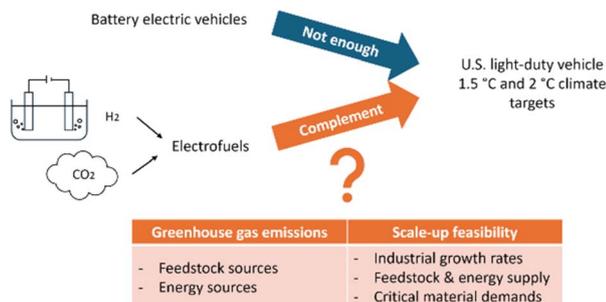
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### Machine learning prediction of the reversible capacities of a biomass-derived hard carbon anode for sodium-ion batteries

Stephen Yaw Owusu\*

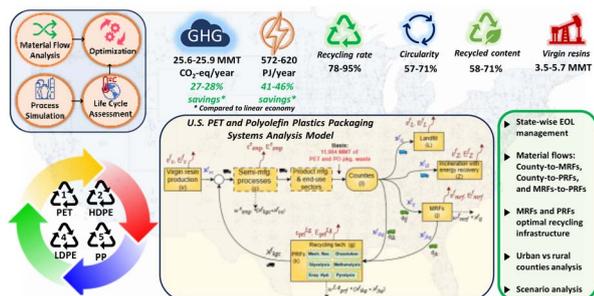
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### Meeting U.S. light-duty vehicle fleet climate targets with battery electric vehicles and electrofuels

Dijuan Liang,\* Alexandre Milovanoff, Hyung Chul Kim, Robert De Kleine, James E. Anderson, I. Daniel Posen and Heather L. MacLean

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### Minimum GHG emissions and energy consumption of U.S. PET and polyolefin packaging supply chains in a circular economy

Utkarsh S. Chaudhari,\* Abhishek Patil, Tasmin Hossain, David W. Watkins, Damon S. Hartley, Barbara K. Reck, Robert M. Handler, Anne T. Johnson, Vicki S. Thompson and David R. Shonnard



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### Screen printability assessment of water-based composite electrodes for lithium-ion batteries

Nora Chelfouh, Ngoc Duc Trinh, Chloé Bois, Audrey Laventure\* and Mickaël Dollé\*



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### Microbial degradation of tannery chrome-solid waste using *Bacillus thuringiensis*: optimization of collagen hydrolysate extraction via response surface methodology

Sharmin Akter Liza and Md. Abdulla-Al-Mamun\*

