

# Green Chemistry

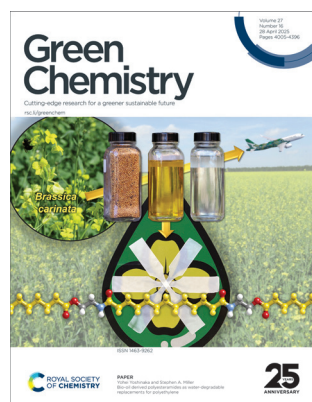
Cutting-edge research for a greener sustainable future

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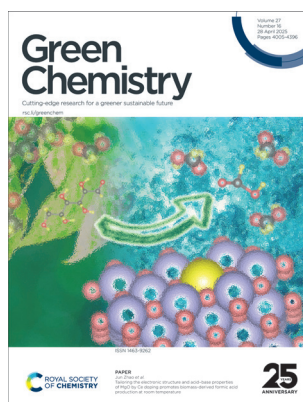
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ISSN 1463-9262 CODEN GRCHFJ 27(16) 4005–4396 (2025)



**Cover**  
See Yohei Yoshinaka and Stephen A. Miller, pp. 4152–4164.

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**Inside cover**  
See Jun Zhao *et al.*, pp. 4165–4176.

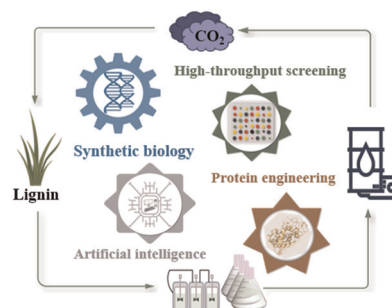
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## CRITICAL REVIEWS

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### Technological advances in ligninolytic enzymes for the biological valorization of lignin

Ning Fu, Ruo-Ying Liu, Ya Zhou, Bing-Zhi Li,\*  
Ying-Jin Yuan and Zhi-Hua Liu\*



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### Recent developments in recycling of post-consumer polyethylene waste

Yang Ma, Xinyao Jiang, Xinyue Xiang, Ping Qu\* and Maiyong Zhu\*



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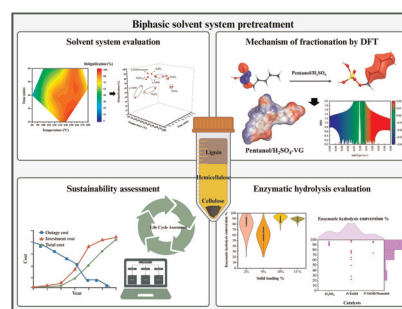
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## CRITICAL REVIEWS

4094

### Harnessing the potential of biphasic solvent systems in lignocellulosic biomass fractionation through computational insights

Maryam Saleknezhad, Meysam Madadi,\* Salauddin Al Azad and Vijai Kumar Gupta\*



## COMMUNICATIONS

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### Electrochemical $\alpha$ -hydroxylation of aryl ketones with methanol as the oxygen source

Zhaoliang Yang,\* Jianwei Huang, Yahao Wang, Haiyan Du, Yuan Zhou\* and Mingming Yu

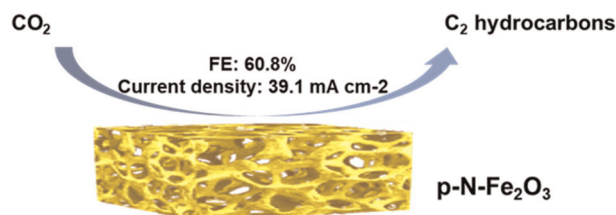


- Oxidant-free and metal-free
- Methanol as the Oxygen Source
- Broad Substrate Scope and high yields
- Scaled up to 2-gram synthesis

4134

### Enhancing the selectivity of C<sub>2</sub> hydrocarbons over Fe-based catalysts by controlling nitrogen doping in electrocatalytic CO<sub>2</sub> reduction

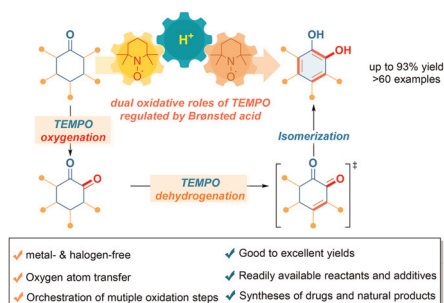
Peng Chen, Shiqiang Liu, Pei Zhang,\* Xinchun Kang, Xing Tong, Jun Ma, Chunjun Chen, Zhimin Liu, Xueqing Xing, Zhonghua Wu, Lirong Zheng and Buxing Han\*



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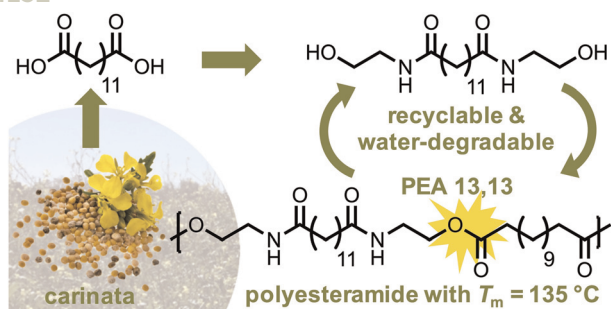
### Synthesis of catechols from cyclohexanones via acid-regulated dual oxidative transformations with TEMPO

Biping Xu, Xiaojie Liu, Lei Deng, Yaping Shang, Xiaoming Jie\* and Weiping Su\*



## PAPERS

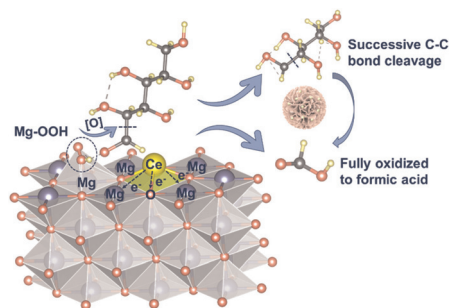
4152



### Bio-oil derived polyesteramides as water-degradable replacements for polyethylene

Yohei Yoshinaka and Stephen A. Miller\*

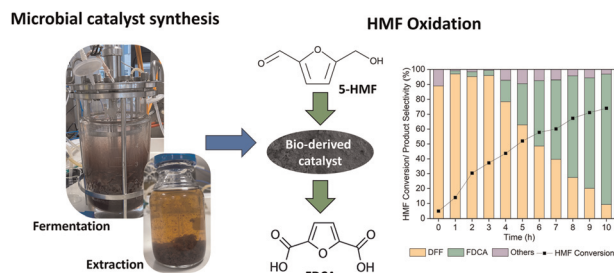
4165



### Tailoring the electronic structure and acid–base properties of MgO by Ce doping promotes biomass-derived formic acid production at room temperature

Yiqi Geng, Wenhua Xue, Jian Ye, Ruilong Zhang, Puranjan Mishra and Jun Zhao\*

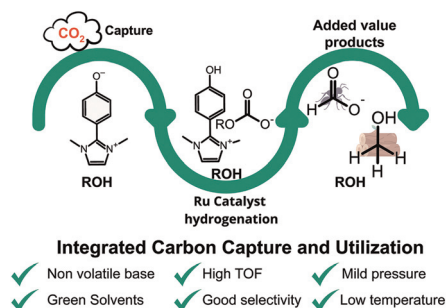
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### Pulcherrimin: a bio-derived iron chelate catalyst for base-free oxidation of 5-hydroxymethylfurfural to furandicarboxylic acid

Swathi Mukundan, Fabio Santomauro, Daniel Miramontes Subillaga, Noelia Villarroel, Adriano Randi, Sandra E. Dann, Jose F. Marco and Jonathan L. Wagner\*

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### Zwitterionic alcoholic solutions for integrated CO<sub>2</sub> capture and hydrogenation

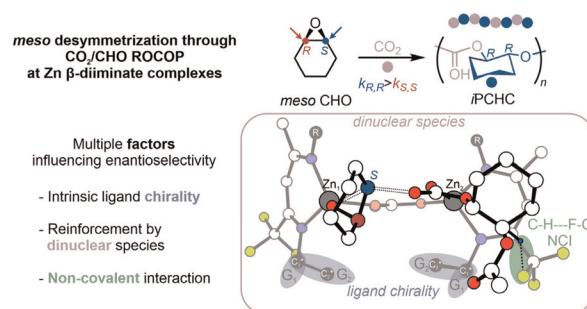
Bruno A. Cândido, Marcelli L. C. Zanirati, Francisco P. dos Santos, Wilmer Villarreal, Jairton Dupont and Pedro Migowski\*



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### Disclosing multiple factors influencing enantioselective copolymerization of CO<sub>2</sub> with *meso*-epoxides using $\beta$ -diiminate Zn catalysts

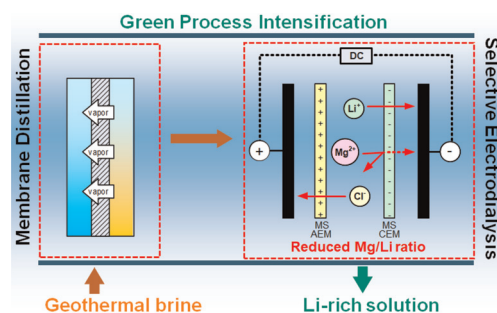
Yolanda Rusconi, Massimo Christian D'Alterio, Claudio De Rosa, Geoffrey W. Coates and Giovanni Talarico\*



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### Sustainable lithium recovery from geothermal brine via integrated membrane distillation – selective electro dialysis

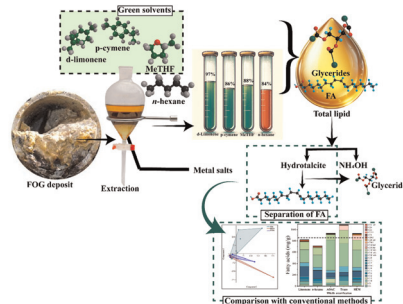
Roviel Berhane Zegeye, Ramato Ashu Tufa,\* Sergio Santoro, Bruno Marco Inzillo, Marco Aquino, Grazia Giuseppina Politano, Alula Selomon Embaye, Pietro Argurio, Loredana De Bartolo and Efrem Curcio



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### Sustainable lipid extraction: green solvents and hydrotalcite as alternatives to conventional methods for measuring fatty acids in fat, oil and grease

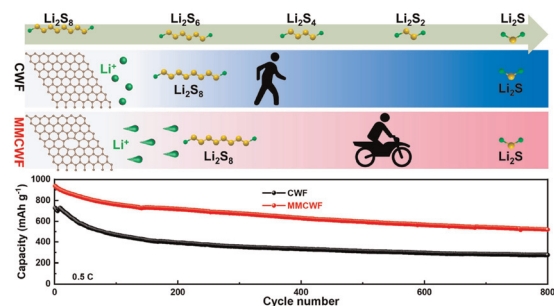
Anika Amir Mohana, Felicity Roddick, Selvakannan Periasamy, Li Gao and Biplob Kumar Pramanik\*



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### Solvothermal-assisted defect engineering in hierarchically porous carbonized wood fibers for high-performance lithium–sulfur batteries

Yangyang Chen, Yu Liao, Lei Li, Yiding Ding, Ying Wu, Zhen Zhang, Sha Luo, Yiqiang Wu and Yan Qing\*



## PAPERS

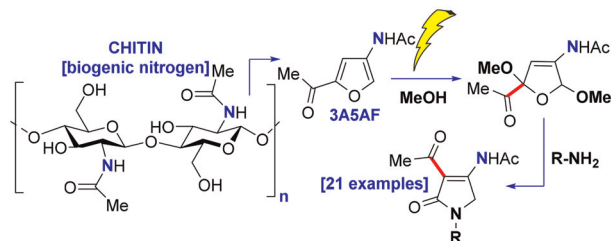
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### Protective fractionation of highly uncondensed lignin with high purity and high yield: new insights into propanediol-blocked lignin condensation

Yaling Zhao, Deqing Zhao,\* Jingpeng He, Kaibin Ma, Jiatian Zhu, Jianrong Liu,\* Yongqi Zhang, Qinqin Xia and Ting Li

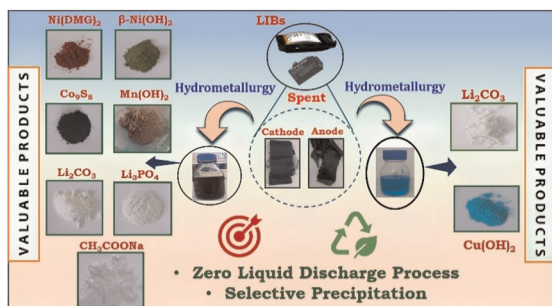
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### Electrochemical oxidation–cyclocondensation of chitin-derived 3-acetamido-5-acetylfuran (3A5AF) for the synthesis of 3-acetyl-4-acetamidopyrrolin-2-ones

Juan J. Arteaga Giraldo, Tilo Söhnel, Paul A. Kilmartin and Jonathan Sperry\*

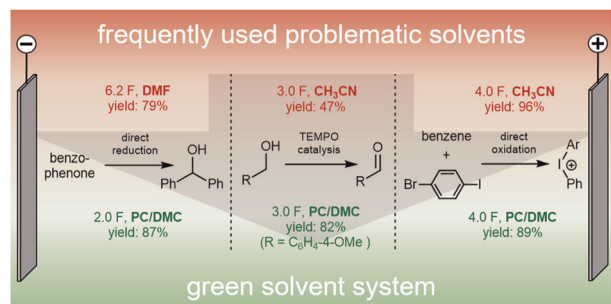
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### A closed-loop zero-liquid-discharge process for the precipitative separation of all valuable metals from waste lithium-ion batteries of mixed chemistries at room-temperature

Nishu Choudhary, Hiren Jungi, Maulik V. Gauswami, Anu Kumari, Arvind B. Boricha,\* Jatin R. Chunawala, Joyee Mitra\* and Alok Ranjan Paital\*

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### On the use of propylene carbonate and dimethyl carbonate as green solvents in organic electrochemistry

Adrian Prudlik, Alexandra Matei, Anton Scherkus, Javier Ivan Bardagi, Sebastian B. Beil\* and Robert Francke\*

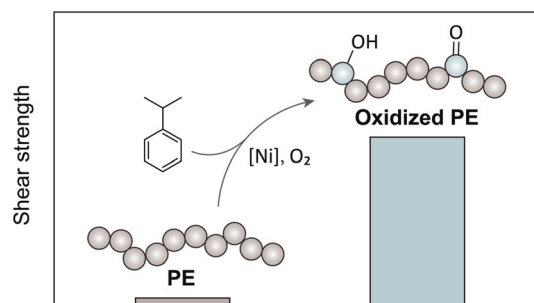


## PAPERS

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**Cumene-mediated aerobic oxidation of polyethylene**

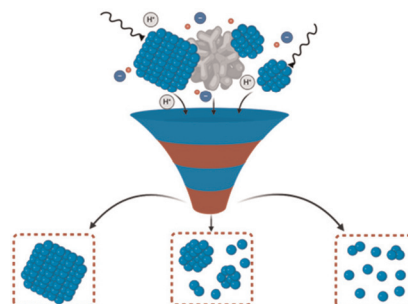
Yizhen Che, Yanfen Wu, Yanyan Zheng, Helai Huang, Qikun Hu and Zhiqiang Niu\*



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**A nano-SPR model for predicting the dissolution rate of metal and metal oxide nanomaterials in the aqueous environment**

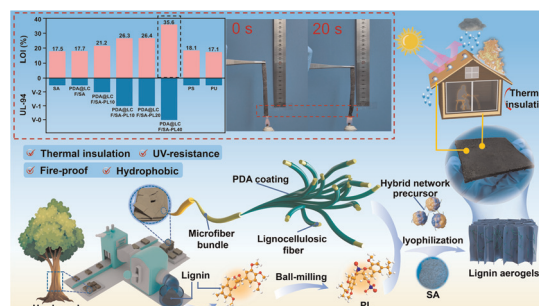
Michal Kalapus and Tomasz Puzyn\*



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**P–N synergy with lignocellulosic biomimetic flame-retardant aerogels for effective fire-safe and thermal insulation**

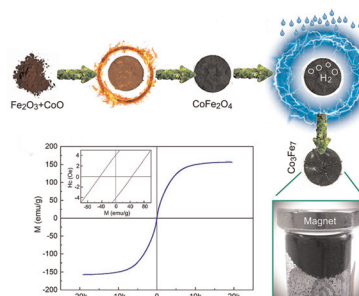
Tao Gui, Shuang-Lin Zou, Hao-Zhen Dou, Wen-Feng Ren, Chang-You Shao, Chun-Lin Xu, Ling-Ping Xiao\* and Run-Cang Sun



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**Water-assisted clean electro-preparation of  $\text{Co}_3\text{Fe}_7$  in molten salts: its enhanced ferromagnetic properties and hydrogen evolution rate**

Shengxi Zhao, Kaiyu Xie and Ali Reza Kamali\*





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## Shedding light on the path to multifunctional task-specific supported ionic liquids with enhanced catalyst stability and activity

Sergio Alcalde, Raúl Porcar, Nuria Martín, Francisco G. Cirujano, Belén Altava and Eduardo García-Verdugo\*

