

# Green Chemistry

Cutting-edge research for a greener sustainable future

[rsc.li/greenchem](https://rsc.li/greenchem)

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

## IN THIS ISSUE

ISSN 1463-9262 CODEN GRCHFJ 27(20) 5659–5908 (2025)



### Cover

See Ning Yan *et al.*, pp. 5715–5727.

Image reproduced by permission of Yiyang Xiao from *Green Chem.*, 2025, **27**, 5715.



### Inside cover

See Carlos Marquez and Sustainable Polymer Technologies (SPOT) Team, pp. 5709–5714.

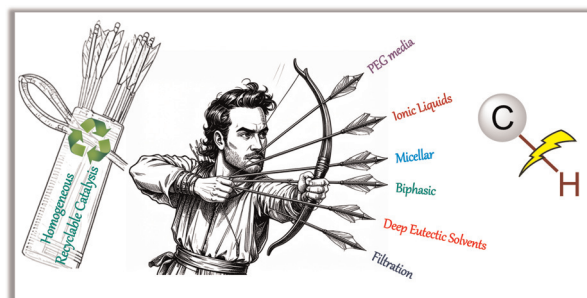
Image reproduced by permission of Carlos Marquez, Elias Feghali from *Green Chem.*, 2025, **27**, 5709.

## TUTORIAL REVIEW

5667

### Green innovations in C–H bond functionalisation: exploring homogeneous recyclable catalytic systems

Dewal S. Deshmukh, Sanjay Singh, Kirtikumar C. Badgujar, Vivek T. Humne, Gajanan V. Korpe\* and Bhalchandra M. Bhanage\*

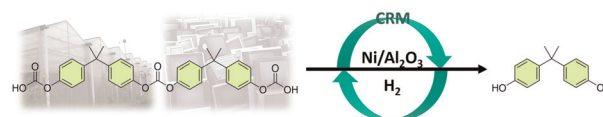


## COMMUNICATION

5709

### Monomer recycling of virgin polycarbonate (PC), end-of-life PC and PC-ABS blends by Ni-catalyzed reductive depolymerization

Carlos Marquez,\* Annelore Aerts, Dambarudhar Parida, Illian Glassee, Harisekhar Mitta, Lingfeng Li, Kevin M. Van Geem, Karolien Vanbroekhoven, Elias Feghali\* and Kathy Elst



# EES Catalysis

GOLD  
OPEN  
ACCESS

**Exceptional research on energy  
and environmental catalysis**

**Open to everyone. Impactful for all**

**[rsc.li/EESCatalysis](https://rsc.li/EESCatalysis)**

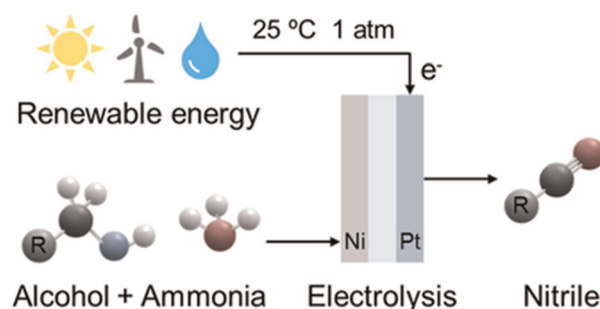
**Fundamental questions  
Elemental answers**

## PAPERS

5715

**Electrosynthesis of nitriles from primary alcohols and ammonia on Ni catalysts**

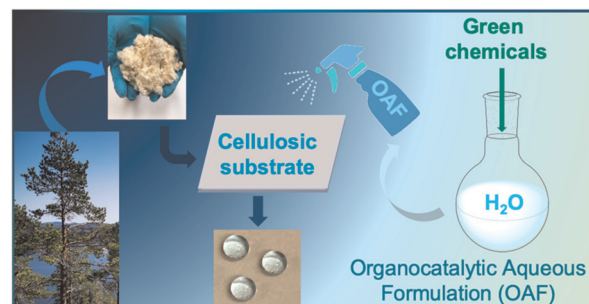
Yiyi Xiao, Chia Wei Lim, Linfeng Gao and Ning Yan\*



5728

**Organocatalytic aqueous formulations: green organocatalytic hydrophobization of heterogeneous polysaccharide-based materials in water through “on-water” mechanisms**

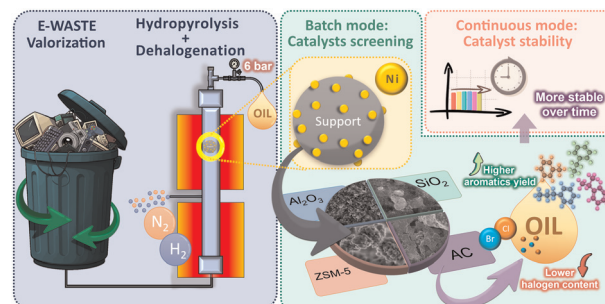
Rana Alimohammadzadeh,\* Dylan Ferreira, Zine Eddine Hamdouche, Tanel Möistlik and Armando Córdova\*



5736

**Assessing supported nickel catalysts for the upcycling of real WEEE plastics through low-pressure hydrolysis and dehalogenation**

Lidia Amodio, Jennifer Cueto, Julio López, Héctor Hernando, Patricia Pizarro and David P. Serrano\*



5753

**Closed-loop chemical recycling of polyethylene furan-2,5-dicarboxylate (PEF) under microwave-assisted heating**

Sean Najmi, Dylan Huang, Andrew Duncan, Daniel Slanac, Keith Hutchenson, James Hughes, Raja Poladi and Dionisios G. Vlachos\*



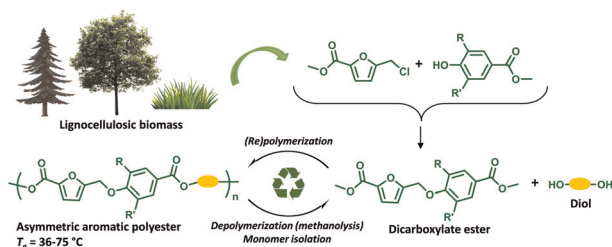
5764



### Electrocatalytic linear coupling of alkenes via radical anion under mild conditions

Jingao Xiao, Feng Long, Sheng Yi, Haifang Luo, Changqun Cai and Hang Gong\*

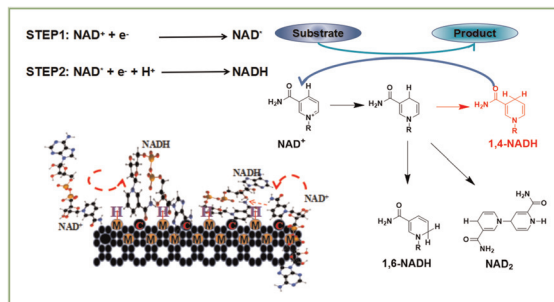
5770



### Closed-loop chemically recyclable aromatic polyesters based on asymmetric dicarboxylates obtainable from lignocellulose

Nitin G. Valsange, Niklas Warlin, Smita V. Mankar, Nicola Rehnberg, Baozhong Zhang\* and Patric Jannasch\*

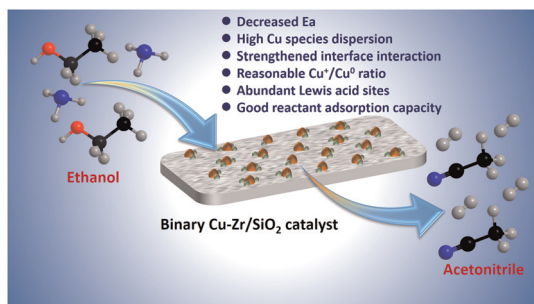
5782



### Metal–carbon electrode optimization for efficient electrochemical regeneration of 1,4-NADH: a new approach for sustainable biochemical synthesis

Yang Zhou, LingLong Huang, Yuan Tao, ChangQing Luo, JianMiao Xu,\* ZhiQiang Liu and YuGuo Zheng

5795



### Selective production of acetonitrile via dehydroamination of ethanol over a stable Cu–Zr/meso SiO<sub>2</sub> catalyst

Xiaomin Zhang, Mo Zhou, Yujia Zhao, Jifeng Pang, Pengfei Wu,\* Zhen Guo\* and Mingyuan Zheng\*



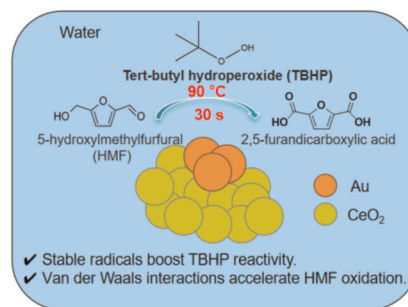


## PAPERS

5810

### *tert*-Butyl hydroperoxide-mediated rapid 30-second oxidation of 5-hydroxymethylfurfural to 2,5-furandicarboxylic acid

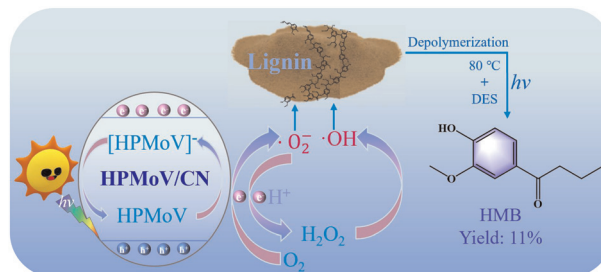
Jian Liu and Ximing Zhang\*



5819

### Photo-promoted production of a new monophenolic compound from larch lignin with polyoxometalates supported on g-C<sub>3</sub>N<sub>4</sub> under ambient conditions

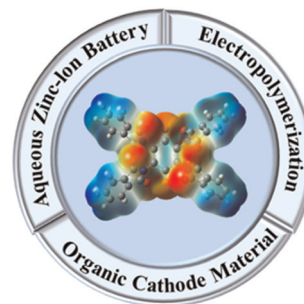
He Wan, Yang Liu, Chunhui Yu, Kuiyuan Cao, Yongwei Han, Zhong Sun, Junyou Shi and Xixin Duan\*



5832

### Towards ultra-stable aqueous zinc-ion batteries via electrochemical polymerization of phthalimido-anchored benzoquinone

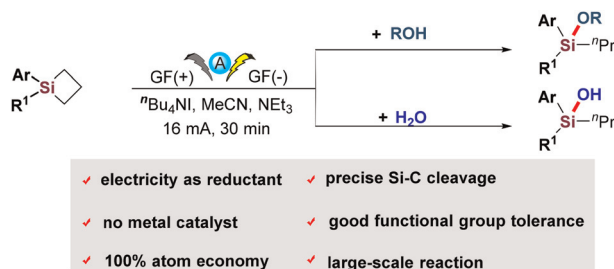
Dan Wang,\* Yu-Xuan Bai, Zi-Xiang Zhou, Wei Cao, Yang-Min Ma and Chao Wang\*



5844

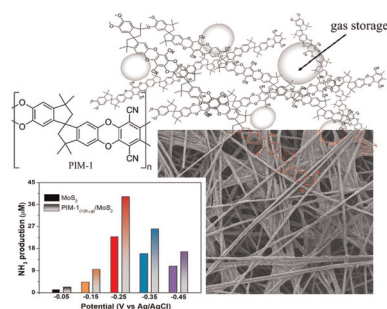
### Electrochemically driven silicon–carbon bond cleavage of silacyclobutanes: a transition metal-free approach

Yuanmeng Li, Jianshu Yue, Yinghui Shao, Yanni Yue,\* Hongping Deng, Xiaoli Bu, Mengtao Ma\* and Fei Xue\*



## PAPERS

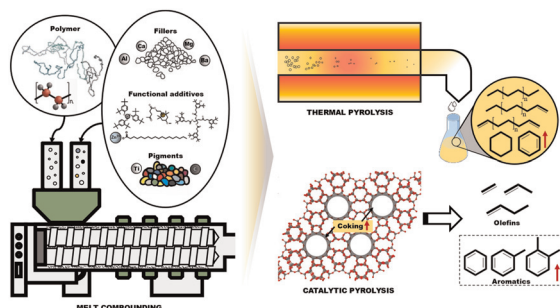
5851



### Enhancing the electroreduction of $\text{N}_2$ and/or $\text{O}_2$ on $\text{MoS}_2$ using a nanoparticulate intrinsically microporous polymer (PIM-1)

Caio V. S. Almeida, Lara K. Ribeiro, Lucia H. Mascaro,\*  
Mariolino Carta, Neil B. McKeown and Frank Marken\*

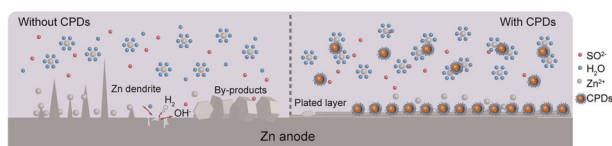
5861



### Influence of functional additives, fillers, and pigments on thermal and catalytic pyrolysis of polyethylene for waste plastic upcycling

Harish Radhakrishnan, Abdulrahman  
A. B. A. Mohammed, Isabel Coffman and Xianglan Bai\*

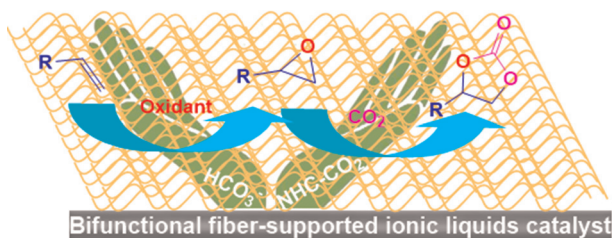
5883



### Carbonized polymer dots as electrolyte additives for suppressing Zn dendrite growth, corrosion, and the HER in Zn-ion batteries

Xiao-Yan Shen, Guo-Duo Yang, Xin-Yao Huang,  
Yan-Fei Li, Zhuo Wang, Tong Wang, Ru-Yi Liu,  
Yi-Han Song, Ming-Xiao Deng\* and Hai-Zhu Sun\*

5892



### Tandem reaction of olefins and $\text{CO}_2$ to cyclic carbonates over polyetheretherketone fiber-supported ionic liquids *via* relay catalysis in a spinning basket reactor

Xian-Lei Shi,\* Ruifeng Jing, Qianqian Hu,  
Honghui Gong, Jingyi Wang, Gang Xu, Bowen Liu\* and  
Ao Zhang

