

# Green Chemistry

Cutting-edge research for a greener sustainable future

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### Cover

See Martyn Poliakoff and Ben L. Feringa, pp. 3001–3005.

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### Inside cover

See Xiaonan Wang, Shanying Hu *et al.*, pp. 3126–3140.

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## OBITUARY

3001

### Obituary: Roger Arthur Sheldon (1942–2025)

Martyn Poliakoff and Ben L. Feringa

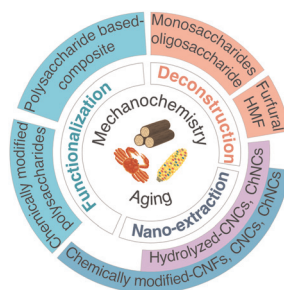


## CRITICAL REVIEWS

3006

### Mechanochemical transformations of polysaccharides to value added products: a review with Green Chemistry evaluation

Galen Yang, Yasmeen Jaber, Edmond Lam and Audrey Moores\*



- 5 to 50-fold more efficient reactions
- Less reagent and auxiliaries
- New reactivity & selectivity
- Safer synthesis



# EES Batteries

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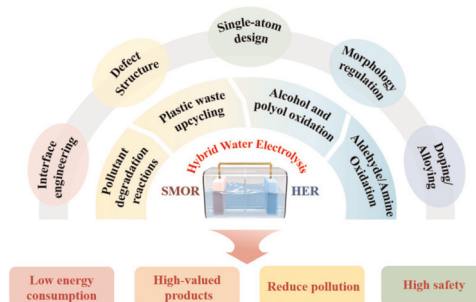
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## CRITICAL REVIEWS

3043

## Hybrid water electrolysis toward energy-efficient hydrogen production coupled with value-added chemical synthesis

Yilin Wu and Pengzuo Chen\*

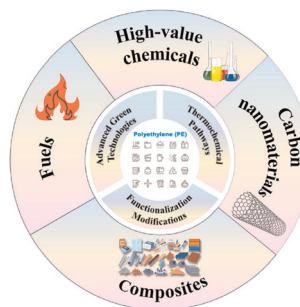


## TUTORIAL REVIEW

3073

## Research progress of high value utilization of waste polyethylene plastics

Mingjun Xiao\* and Xihang Dai

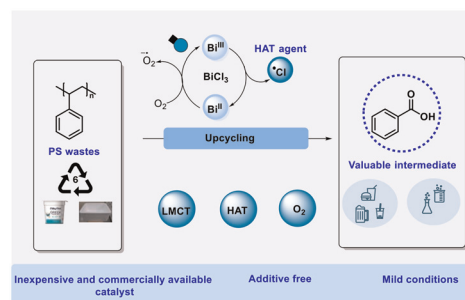


## COMMUNICATIONS

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Photochemical upcycling of polystyrene waste by  $\text{BiCl}_3$ 

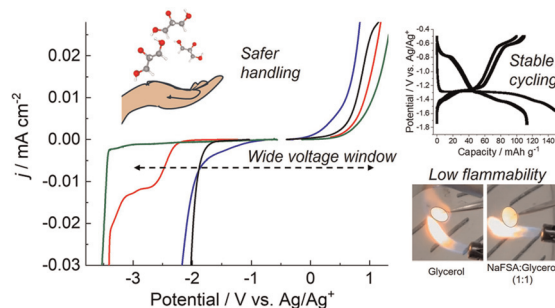
S. Srividya, Apurba Kumar Pal and K. Geetharani\*



3119

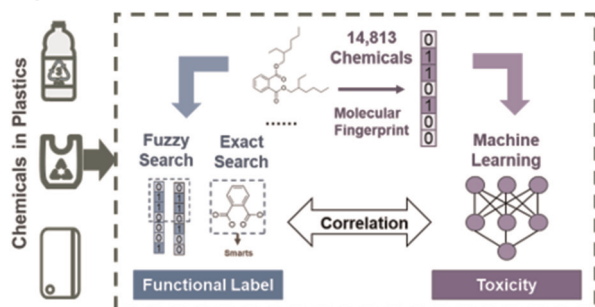
## Glycerol electrolytes for safer and more sustainable sodium ion batteries

Zachary T. Gossage,\* Teppei Furuichi, Tomooki Hosaka, Kei Shibuya and Shinichi Komaba\*



## PAPERS

3126

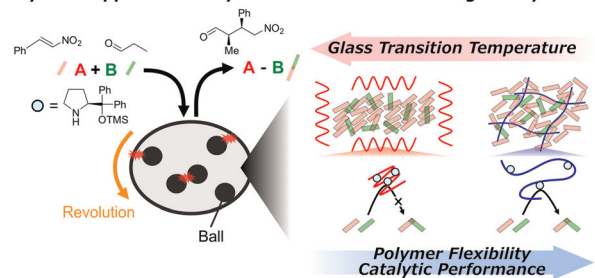


### Toward comprehensive scientific information on plastic-related chemicals powered by artificial intelligence

Kai Zhao, Xiting Peng, Ran Tao, Yuchen Su, Shiyue Huang, Hang Fu, Xiaonan Wang\* and Shanying Hu\*

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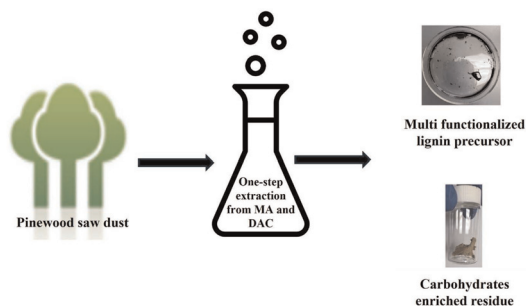
### Polymer-supported Catalyst for Mechanochemical Organic Synthesis



### Solvent-less mechanochemical asymmetric reactions in a ball mill utilizing a polymer-supported Hayashi–Jørgensen catalyst: effects of the polymer backbone and flexibility on its catalytic performance

Kento Hiroishi, Hikaru Matsumoto,\* Hidetaka Kasai, Masanori Nagao, Eiji Nishibori and Yoshiko Miura\*

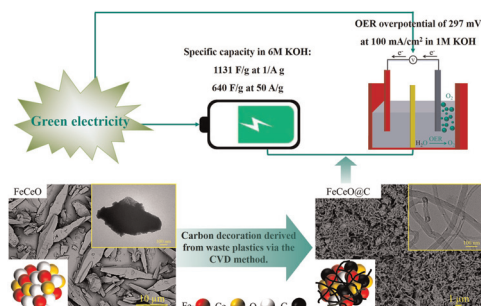
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### Green chemistry design of one-step extraction of multi-functionalized lignin-precursors directly from biomass

Kavya Ganesan, James Sternberg and Srikanth Pilla\*

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### Constructing bifunctional electrodes of FeCeO with tunable carbon decoration from waste plastics for efficient energy storage and the oxygen evolution reaction

Shizhen Zhang, Xu Hou,\* Jing Huang, Li Yin and Enxian Yuan\*

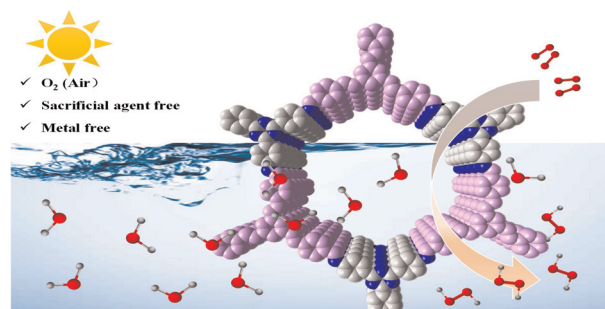


## PAPERS

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### Triazine-functionalized donor- $\pi$ -acceptor covalent organic frameworks with oligo(phenylenevinylene) bridge for efficient photocatalytic $\text{H}_2\text{O}_2$ evolution

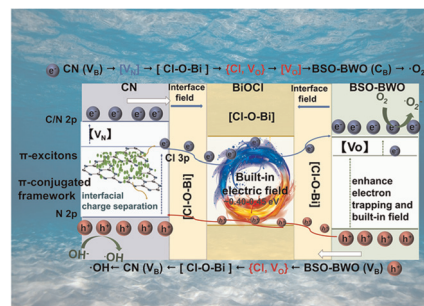
Jie Fan, Shiguang Lv, Yayu Yan, Qiaohong Li,\*  
Shao-Xia Lin\* and Daqiang Yuan\*



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### Rational co-engineering of $\pi$ -exciton and oxygen vacancy via a mild halide-exchange strategy: a sustainable blueprint for highly efficient S-scheme photocatalysts

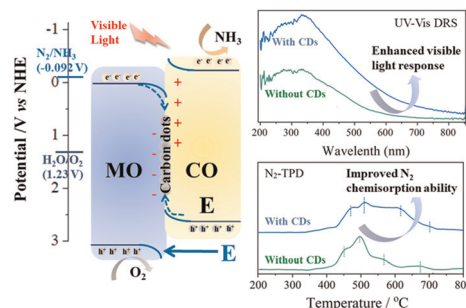
Jingyue Hu,\* Yuanting Wu,\* Weizhi Tian, Lihui Guo,  
Xinmeng Zhang, Ou Hai, Hulin Liu, Yunlong Xue and  
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### Embedded carbon dot mediator in a $\text{Ce-MoO}_{3-x}$ heterojunction for improved visible-light-driven $\text{N}_2$ fixation: performance and interfacial activation mechanism

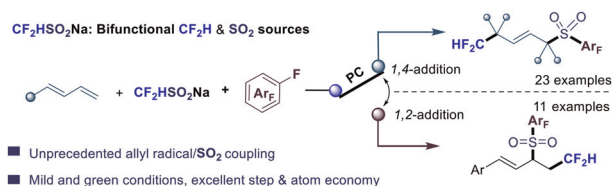
Huaiwei Zhang,\* Liang Bao, Ying Pan, Lulu Xu\* and  
Wei Wang



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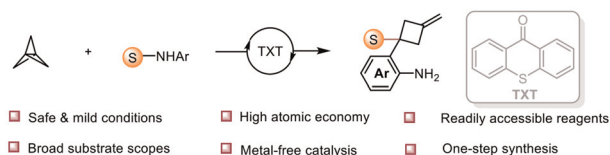
### Photoredox-catalyzed cascade difluoromethylation/ $\text{SO}_2$ reintegration/polyfluoroarylation of conjugated dienes with a bifunctional $\text{CF}_2\text{HSO}_2\text{Na}$ reagent

Kehan Jiao, Yunliang Guo, Jiuli Xia, Kaixuan Chen,  
Lihan Zhu, Ying Dong, Jiao Qu, Guangfan Zheng,\*  
Jiaqiong Sun,\* Tao Xiong and Qian Zhang



## PAPERS

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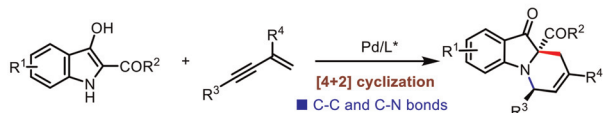


### Construction of sulfur-substituted methylenecyclobutanes via thioaromatization of [1.1.1]propellane with sulfenamides

Jun Hong, Tianbao Wu, Zhihao Yu, Yu Zhu, Daijun Tang, Minyan Wang\* and Xinpeng Jiang\*

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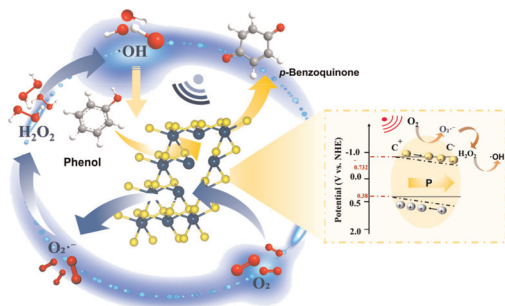
#### Asymmetric Sequential Hydroalkylation and Hydroamination of 1,3-Enynes



### Palladium-catalyzed asymmetric sequential hydroalkylation and hydroamination of 1,3-enynes with 3-hydroxyindoles

Qiuyu Li, Ruixue Wu, Tianbao Wu, Renkang Wei, Zhijiao Li, Shang Gao, Minyan Wang,\* Hequan Yao\* and Aijun Lin\*

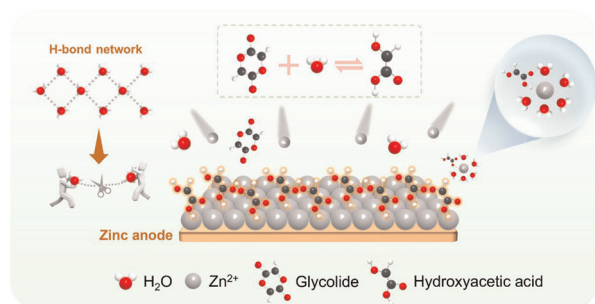
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### Piezocatalytic oxidation of lignin-derived phenol to *p*-benzoquinone: a sustainable route for green polymerization inhibitors

Xinlei Ma, Bo Zhang,\* Xin Huang, Qing Xu and Roger Ruan

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### Trace electrolyte additives dynamically regulating the zinc anode interface towards stable zinc-based energy storage

Xinyu Yang, Ke Zhang and Liubing Dong\*

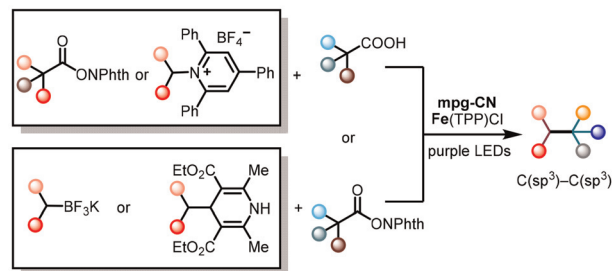


## PAPERS

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Semi-heterogeneous dual iron/photocatalytic decarboxylative C(sp<sup>3</sup>)–C(sp<sup>3</sup>) cross-coupling via radical sorting

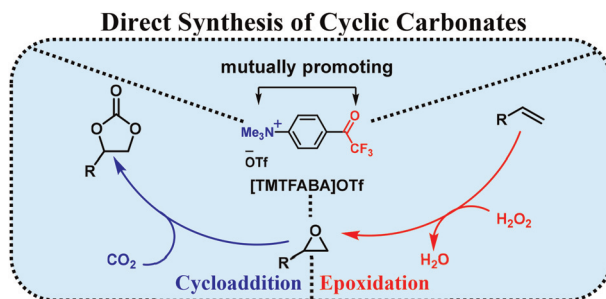
Yajun Sun, Tengfei Kang,\* Yingdi Feng, Huaming Sun, Geyang Song and Dong Xue\*



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Direct synthesis of cyclic carbonates from olefins and CO<sub>2</sub> via ionic liquid catalysis with mutually promoting bifunctional groups

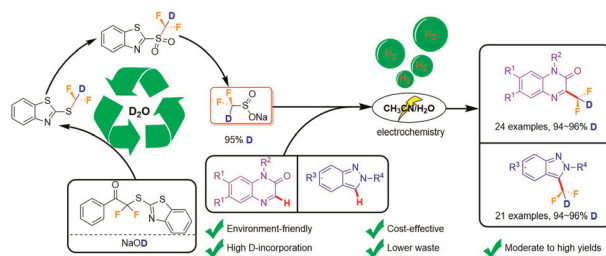
Li-Feng Xu, Wen-Jun Xie, Shan-Shan Chen, Alexander O. Terent'ev, Hong-Ru Li\* and Liang-Nian He\*



3286

Electrochemical C(sp<sup>2</sup>)–H deuterodifluoromethylation of quinoxalines and 2H-indazoles with CF<sub>2</sub>DSO<sub>2</sub>Na

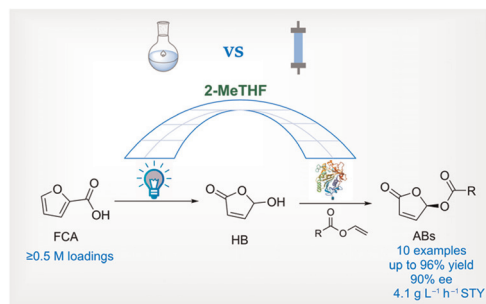
Yuhang Ding, Xin Liu, Yanlin Wu, Meichao Li\* and Zhenlu Shen\*



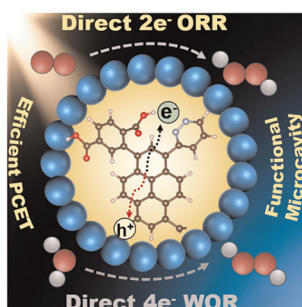
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## Asymmetric photoenzymatic synthesis of chiral γ-acyloxybutenolides from 2-furoic acid in 2-methyltetrahydrofuran: from batch to flow process

Yi He and Ning Li\*



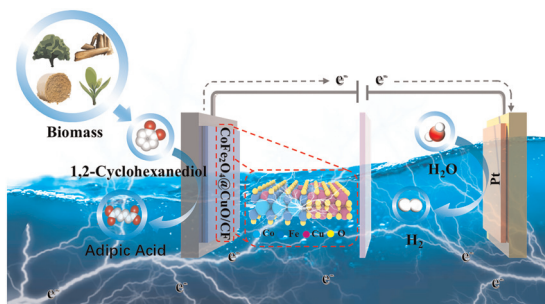
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### Spatially confined proton-coupled electron transfer in functional microcavities for photocatalytic H<sub>2</sub>O<sub>2</sub> production in pure water

Yanzhuo Zhao, Xiaoya Li, Linghao Liu, Yuanying Liu, Yan Li, Xin Zhang, Hang Wang, Yichao Huang, Lin Wang\* and Chuan-De Wu\*

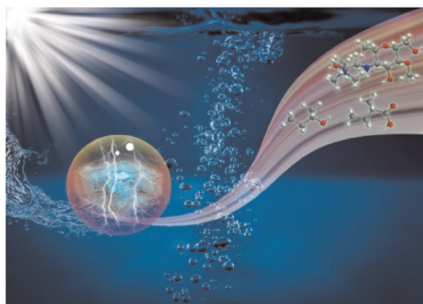
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### Electrocatalytic oxidation of 1,2-cyclohexanediol to adipic acid with high faradaic efficiency under high current density over a CoFe<sub>2</sub>O<sub>4</sub>@CuO/CF catalyst

Xuzheng Cao, Gang Yan,\* Qi Zhao, Huaqiao Tan,\* Wensi Tang, Aicen Li and Yangguang Li\*

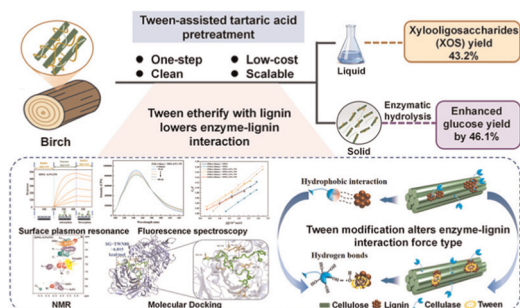
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### High-performance multi-component synergistic hydrogel electrolyte with enhanced ion transport for flexible zinc–air batteries and wearable sensors

Qiusheng Zhou,\* Li Song, Minmin Song, Linfang Lu, Weihao Pan, Xianying He, Chenxu Zhao, Ziyu Zhao and Chuanyin Xiong\*

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### A green strategy for co-production of xylooligosaccharides and fermentable sugars from birch via tween-assisted tartaric acid pretreatment

Rutong Jiang, Bin Bian, Ruoyan Li, Qijun Wu, Daihui Zhang, Caoxing Huang, Chenhuan Lai,\* Mi Li\* and Qiang Yong

