

# Green Chemistry

Cutting-edge research for a greener sustainable future

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See Wei-Min He *et al.*, pp. 7983–7987.

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### Inside cover

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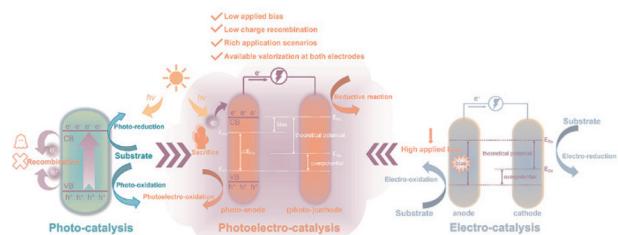
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# Green Chemistry

Cutting-edge research for a greener sustainable future

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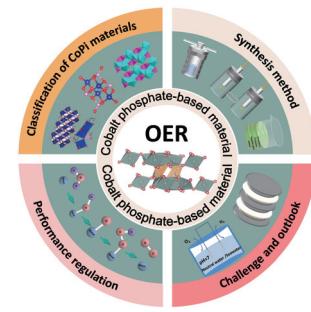


## TUTORIAL REVIEWS

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## Research status, opportunities, and challenges of cobalt phosphate based materials as OER electrocatalysts

Xingheng Zhang, Qi Hou, Shoufu Cao, Xiaojing Lin, Xiaodong Chen, Zhaojie Wang,\* Shuxian Wei, Siyuan Liu, Fangna Dai and Xiaoqing Lu\*

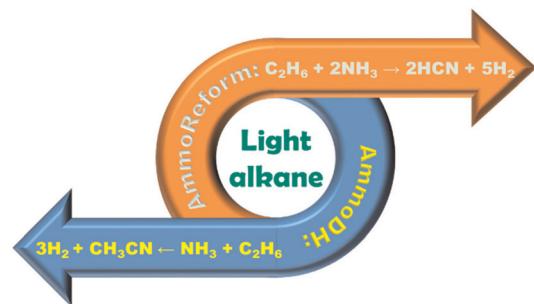


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## Ammonia-assisted reforming and dehydrogenation toward efficient light alkane conversion

Yizhi Xiang

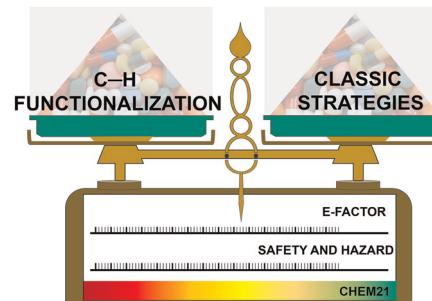


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## Classic vs. C–H functionalization strategies in the synthesis of APIs: a sustainability comparison

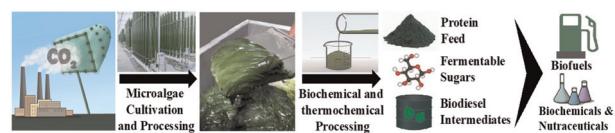
Francesco Ferlin, Giulia Brufani, Gabriele Rossini and Luigi Vaccaro\*



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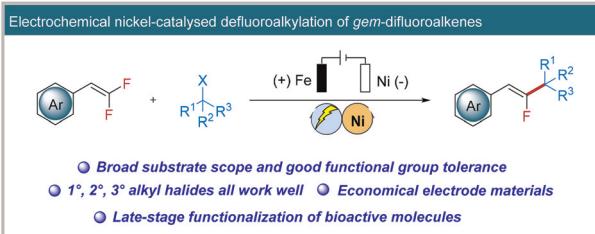
## Potential of using microalgae to sequester carbon dioxide and processing to bioproducts

Venkatesh Balan,\* James Pierson, Hasan Husain, Sandeep Kumar, Christopher Saffron and Vinod Kumar



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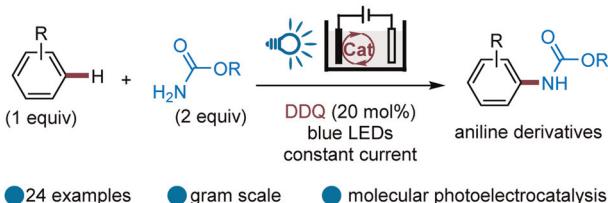
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### Electrochemical nickel-catalysed defluoroalkylation of *gem*-difluoroalkenes with alkyl halides

Yin Liu, Pengfei Li, Jun Tan, Guangsheng Kou, Dengke Ma\* and Youai Qiu\*

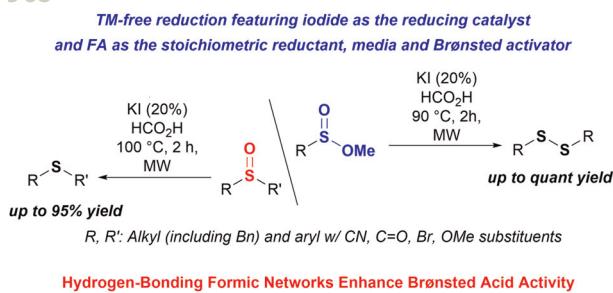
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### Photoelectrocatalytic C–H amination of arenes

Zhong-Wei Hou, Hong Yan, Jinshuai Song\* and Hai-Chao Xu\*

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J. Armando Luján-Montelongo,\* Luis Javier García de la Cuesta, Alicia E. Cruz-Jiménez, Perla Hernández and Alberto Vela

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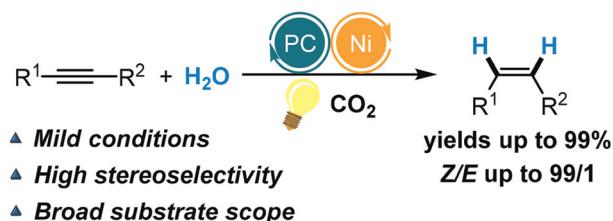


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**CO<sub>2</sub> promoted photoredox/Ni-catalyzed semi-reduction of alkynes with H<sub>2</sub>O**

Shenhao Chen and Chanjuan Xi\*

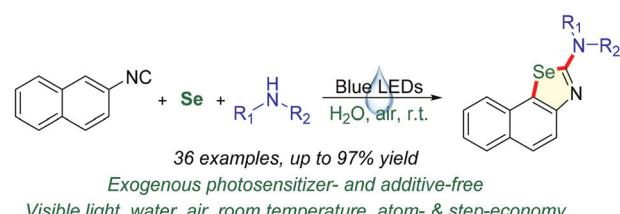


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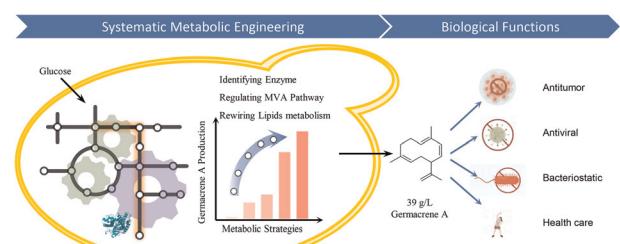
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**Reprogramming the metabolism of oleaginous yeast for sustainably biosynthesizing the anticarcinogen precursor germacrene A**

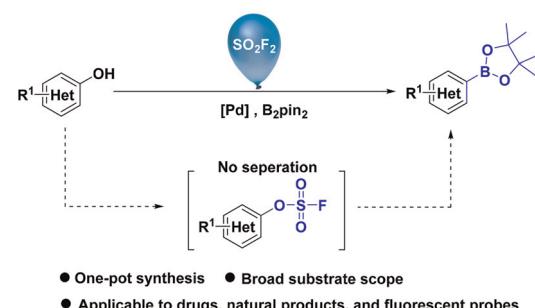
Qi Liu, Ge Zhang, Lijiu Su, Pi Liu, Shiru Jia, Qinhong Wang and Zongjie Dai\*



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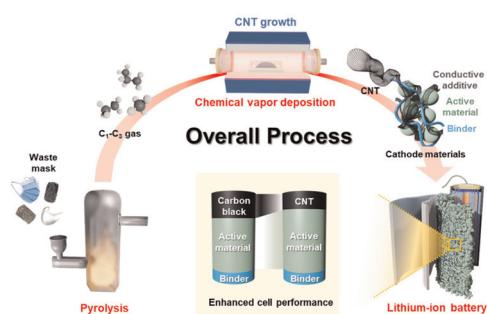
**Borylation of phenols using sulfonyl fluoride activation**

Zhengjun Chen, Yan Liu, Chunhua Zeng, Changyue Ren, Hongyu Li, Rajenahally V. Jagadeesh,\* Zeli Yuan\* and Xinmin Li\*



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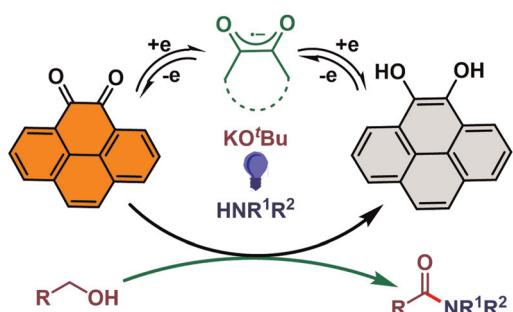
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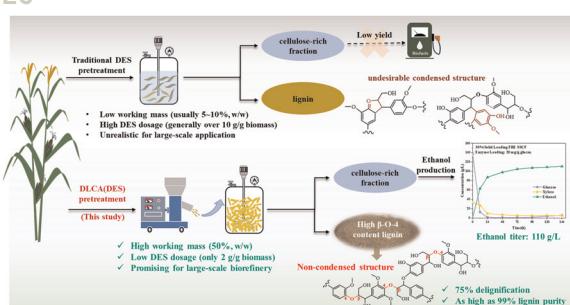
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### Organophotocatalytic dehydrogenative preparation of amides directly from alcohols

Shyamali Maji, Monojit Roy, Kanchan Shaikh and Debashis Adhikari\*

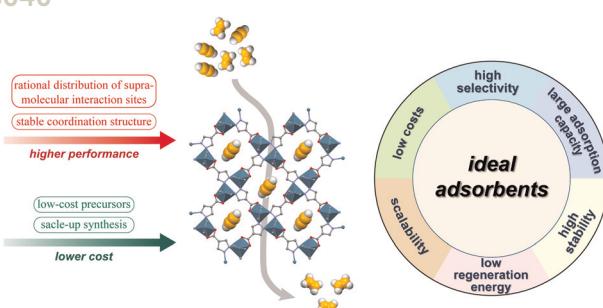
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### Densification pretreatment with a limited deep eutectic solvent triggers high-efficiency fractionation and valorization of lignocellulose

Guannan Shen, Xinchuan Yuan, Yin Cheng, Sitong Chen, Zhaoxian Xu and Mingjie Jin\*

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Hengcong Huang, Yifan Gu, Luyao Wang, Tao Jia, Susumu Kitagawa and Fengting Li\*

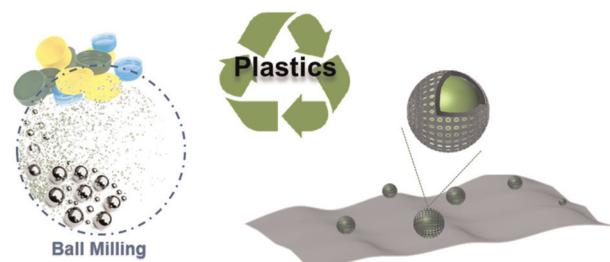


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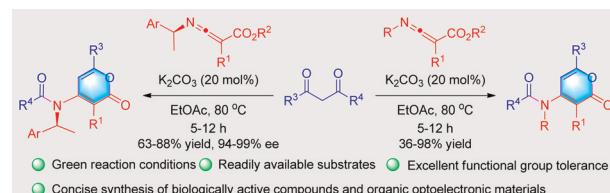
Jiahua Zhao, Qiang Niu, Junjun Zhang\* and Pengfei Zhang\*



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**Green and effective synthesis of multisubstituted  $\alpha$ -pyrones via  $K_2CO_3$  catalyzed formal insertion of ketenimines into C(CO)–C bonds of 1,3-diketones**

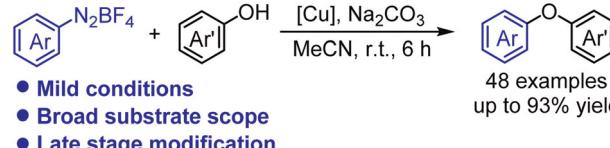
Jian Luo, Ai-Qing Zhong, Jia-Hao Qiu, Xiong-Wei Liu,\* You-Ping Tian, Bao-Hua Zhang,\* Guo-Shu Chen, Wei Shu and Yun-Lin Liu\*



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**Copper-catalyzed O-arylation of phenols with diazonium salts**

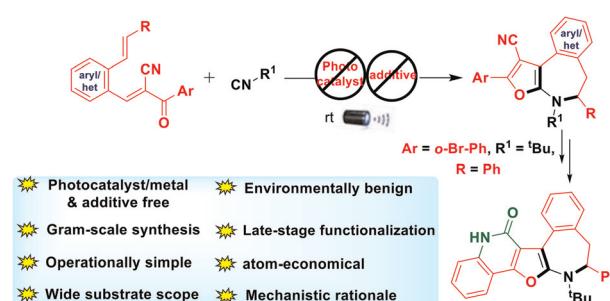
Xin Fang, Chengning Qi, Xiangqian Cao, Zhi-Gang Ren, David James Young and Hong-Xi Li\*



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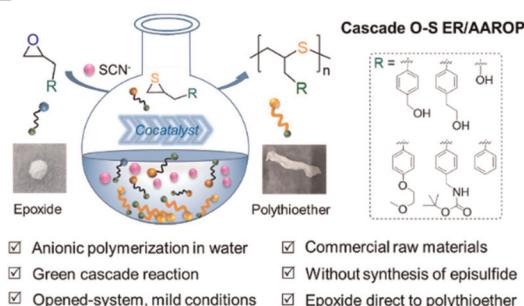
**Photocatalyst- and transition-metal-free syntheses of furan-fused dihydroazepines by visible light**

Babasaheb Sopan Gore,\* Chiao-Ying Kuo and Jeh-Jeng Wang\*



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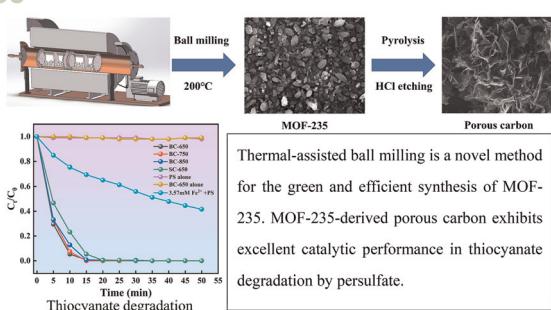
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Ying Quan, Cuihong Ma, Qiancai Liu, Zhiying Han, Huijing Han, Xiaojuan Liao,\* Ruyi Sun\* and Meiran Xie\*

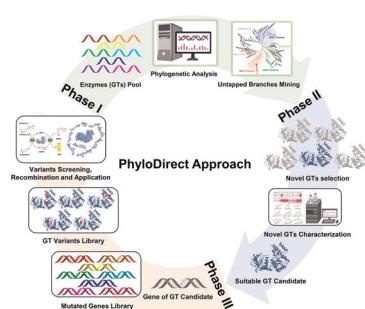
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Yang Yang, Binchuan Li, Daxue Fu, Jianshe Chen, Shuang Cui, Xiaocai He, Kuiren Liu, Shicheng Wei, Da Li and Qing Han\*

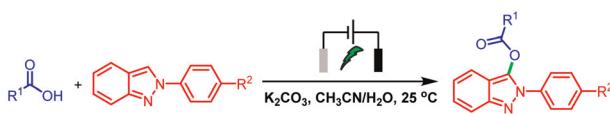
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### A phylogeny-based directed evolution approach to boost the synthetic applications of glycosyltransferases

Peng Zhang, Yu Ji,\* Shuaiqi Meng, Zhongyu Li, Dennis Hirtz, Lothar Elling and Ulrich Schwaneberg\*

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### Electrochemical C3 acyloxylation reactions of 2H-indazoles with carboxylic acids via C(sp<sup>2</sup>)-O coupling

Xin Liu, Yibin Hu, Yuanbin She, Meichao Li\* and Zhenlu Shen\*

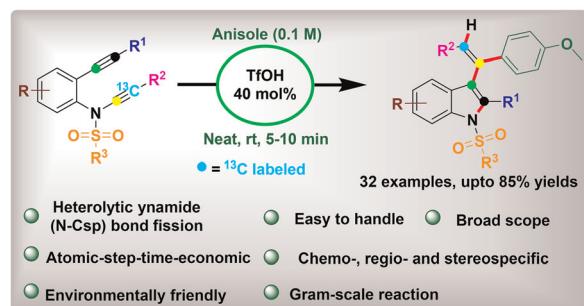


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**Green and rapid acid-catalyzed ynamide skeletal rearrangement and stereospecific functionalization with anisole derivatives**

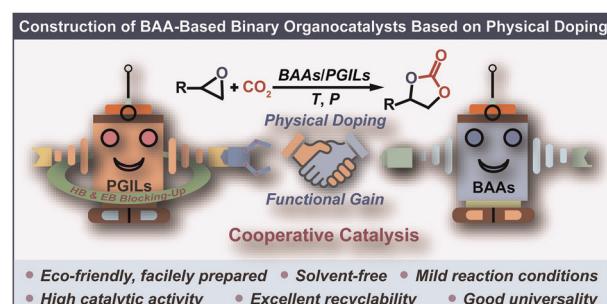
Mohana Reddy Mutra,\* T. L. Chandana, Yun-Jou Wang and Jeh-Jeng Wang\*



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**Functionally enhanced basic amino acid-based binary organocatalysts based on physical doping for efficient coupling of CO<sub>2</sub> with epoxides**

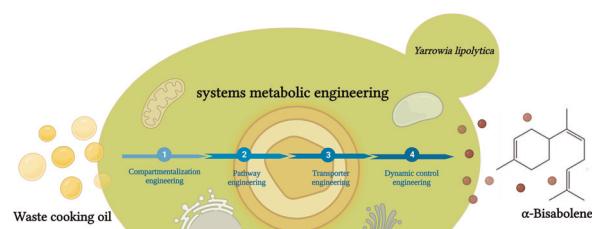
Fan Wang, Congxia Xie, Hongbing Song and Xin Jin\*



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**Biosynthesis of  $\alpha$ -bisabolene from low-cost renewable feedstocks by peroxisome engineering and systems metabolic engineering of the yeast *Yarrowia lipolytica***

Baixiang Zhao, Yahui Zhang, Yaping Wang, Zhihui Lu, Lin Miao, Shuhui Wang, Zhuo Li, Xu Sun, Yuqing Han, Sicheng He, Ziyuan Zhang, Dongguang Xiao, Cuiying Zhang,\* Jee Loon Foo,\* Adison Wong\* and Aiqun Yu\*



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**Efficient Fe<sub>3</sub>O<sub>4</sub> nanoparticle catalysts for depolymerization of polyethylene terephthalate**

Yoonjeong Jo, Eun Jeong Kim, Jueun Kim and Kwangjin An\*



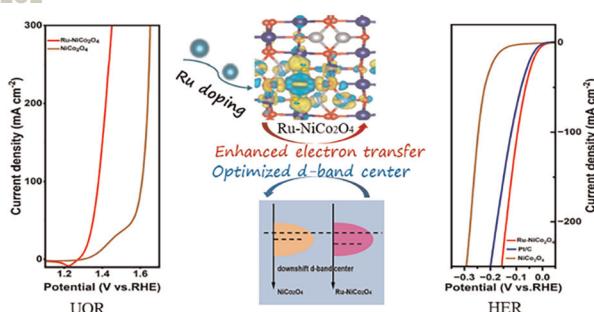
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**Organoborane-catalysed reductive depolymerisation of catechyl lignin under ambient conditions**

Shihao Su, Fan-shu Cao, Shuizhong Wang,\*  
Qingru Shen, Gen Luo,\* Qiang Lu and Guoyong Song\*

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**Elaborately tailored NiCo<sub>2</sub>O<sub>4</sub> for highly efficient overall water splitting and urea electrolysis**

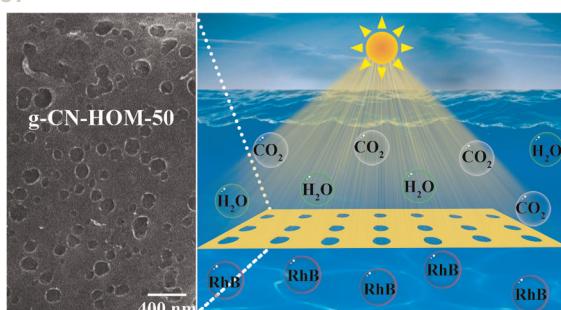
Yamei Wang, Lanli Chen, Huaming Zhang,\*  
Muhammad Humayun, Junhong Duan, Xuefei Xu,  
Yanjun Fu, Mohamed Bououdina and Chundong Wang\*

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**Facet-dependent electrocatalytic oxidation activity of  $Co_3O_4$  nanocrystals for 5-hydroxymethylfurfural**

Zhenchuan Zhang, Zhaohui Yang, Chenyang Wei,  
Zhenghui Liu and Tiancheng Mu\*

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**Controllable construction of graphitic carbon nitride with highly-ordered macropores for boosting photodegradation**

Ruxia Li, Xiaoxiang Fan, Jianqi Meng, Jie Wu,  
Jinjuan Zhao, Ruifa Jin, Honglei Yang\* and Shuwen Li\*

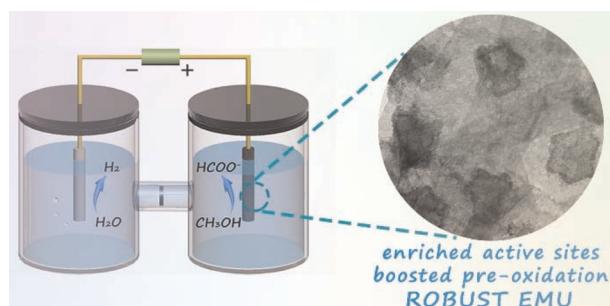


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**Tailoring the catalytically active sites in Co-based catalysts for electrochemical methanol upgrading to produce formate**

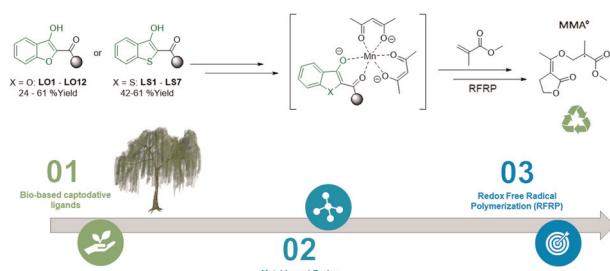
Yameng Wang, Xue Yang, Kexin Wang, Zimeng Liu, Xiaoning Sun, Jinyue Chen, Shanshan Liu, Xu Sun, Junfeng Xie\* and Bo Tang\*



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**Bio-based captodative ligands for redox polymerization of E illum® thermoplastic composites under mild conditions**

Nicolas Giacoletto, Marie Le Dot, Hizia Cherif, Fabrice Morlet-Savary, Bernadette Graff, Valérie Monnier, Didier Gigmes, Frédéric Dumur, Hamza Olleik, Marc Maresca, Pierre Gerard, Malek Nechab\* and Jacques Lalevée\*



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**Feedstock agnostic upcycling of industrial mixed plastic from shredder residue pragmatically through a composite approach**

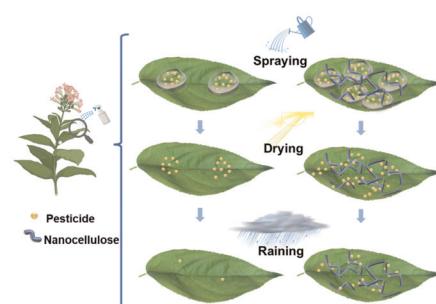
Kanjanawadee Singkronart, Andre Gaduan, Siti Rosminah Shamsuddin, Keeran Ward and Koon-Yang Lee\*



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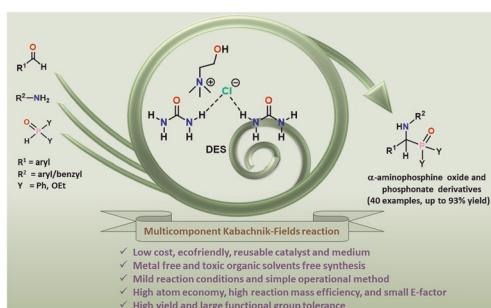
**Effectively enhancing topical delivery of agrochemicals onto plant leaves with nanocelluloses**

Shangxu Jiang, Peng Li,\* Li Li, Nasim Amiralian, Divya Rajah and Zhi Ping Xu\*



## PAPERS

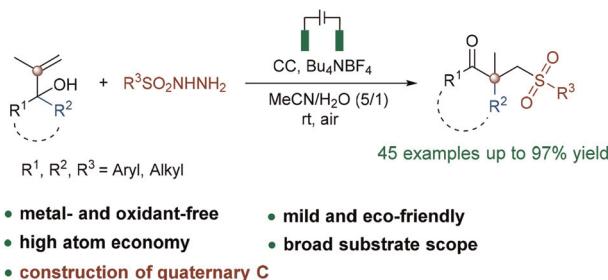
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### Synthesis of $\alpha$ -aminophosphorous derivatives using a deep eutectic solvent (DES) in a dual role

Susmita Mandal, Rajrani Narvariya, Shiva Lall Sunar, Ishita Paul, Archana Jain\* and Tarun K. Panda\*

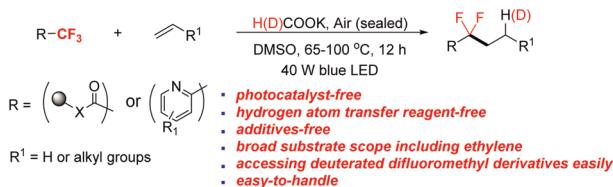
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### Electrochemical synthesis of $\gamma$ -keto sulfones containing a $\beta$ -quaternary carbon center via 1,2-migration

Wen Xia, Yawen Yang, Xiaohui Zhang, Liangzhen Hu\* and Yan Xiong\*

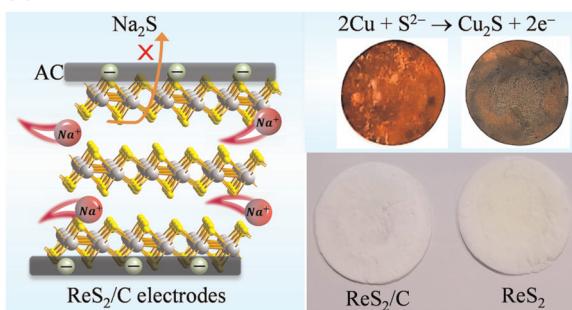
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### Catalyst-free defluorinative alkylation of trifluoromethyls

Yan Huang, Yuan-Cui Wan, Yu Shao, Le-Wu Zhan, Bin-Dong Li\* and Jing Hou\*

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### Carbon-coated $\text{ReS}_2$ hierarchical nanospheres to inhibit polysulfide dissolution in ether-based electrolytes for high-performance Na-ion batteries

Jun Xu,\* Xuhui Zhang, Fang Cao, Zilin Mao, Junbao Jiang, Junwei Chen, Yan Zhang\* and Kun Xing\*

