

# 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 26(14) 8041–8432 (2024)



### Cover

See Robert Wojcieszak, Ivaldo Itabaiana *et al.*, pp. 8211–8219.

Image reproduced by permission of Robert Wojcieszak from *Green Chem.*, 2024, **26**, 8211. Artwork created by Ella Maru Studio.



### Inside cover

See Chia-Yu Lin *et al.*, pp. 8220–8229.

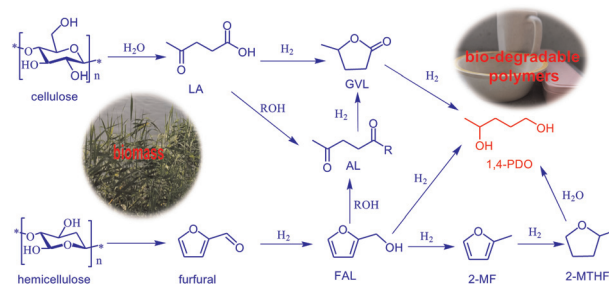
Image reproduced by permission of Chia-Yu Lin and NCKU Material from *Green Chem.*, 2024, **26**, 8220.

## CRITICAL REVIEWS

8052

### Catalytic production of 1,4-pentanediol from lignocellulosic biomass

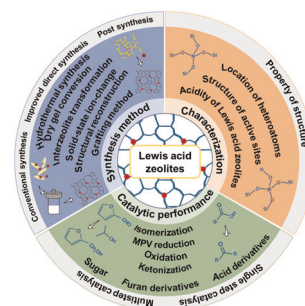
Shanhui Zhu,\* Zexiang Lv, Jiamin Wang, Xiangyu Jia, Xiaoming Li, Mei Dong, Jianguo Wang\* and Weibin Fan\*



8068

### Heteroatom Lewis acid zeolites: synthesis, characterization and application in the conversion of biomass-derived oxygenates

Zijun Yang, Qingfeng Ge and Xinli Zhu\*



# ChemComm

**Uncover new possibilities  
with outstanding  
preliminary research**

**Original discoveries, fuelling  
every step of scientific progress**

**[rsc.li/chemcomm](http://rsc.li/chemcomm)**

**Fundamental questions  
Elemental answers**

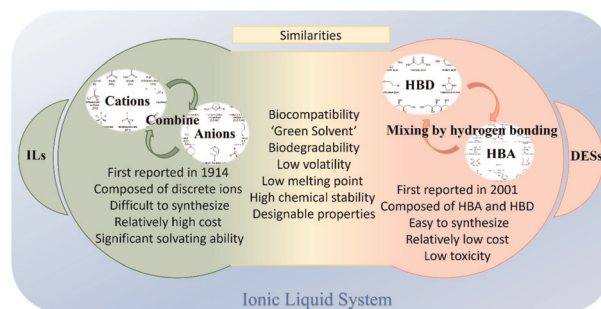


## CRITICAL REVIEWS

8100

## Review of the application of ionic liquid systems in achieving green and sustainable recycling of spent lithium-ion batteries

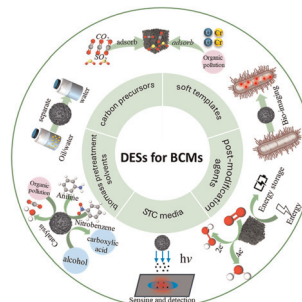
Huiying Shi, Yi Luo, Chengzhe Yin and Leming Ou\*



8123

## Emerging applications of deep eutectic solvents in the preparation and functionalization of biomass-derived carbonaceous materials: challenges and prospects

Yiyi Shen, Haiqin Zhou, Xiaotong He, Feng Shen, Zhixiang Xu, Bo Yang, Lingzhao Kong and Lichun Dai\*

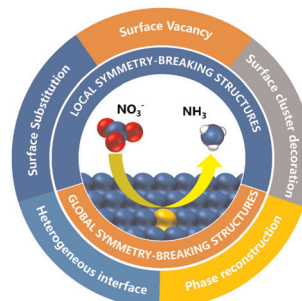


## TUTORIAL REVIEWS

8145

## Symmetry-breaking structure electrocatalysts for nitrate reduction to ammonia

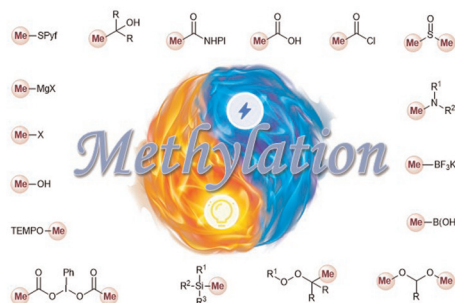
Yifan Han, Jiachangli Shang, Shuai Yin, Rong Cao, Jing Zhang,\* Wei Jiang\* and Guigao Liu\*



8161

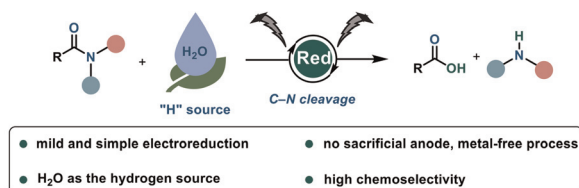
## Demystifying the recent photochemical and electrochemical strategies in installing the magic methyl group: a comprehensive overview

Feiyang Liao, Zenghui Wei, Yunhao Guan, Zhe Zhuang, Kun Xu\* and Jiajing Tan\*



## COMMUNICATION

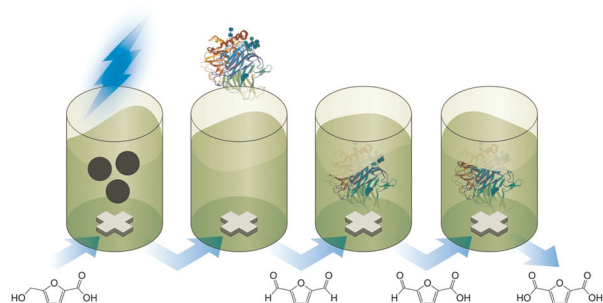
8204

Electroreductive hydrolysis of amides by H<sub>2</sub>OHighly selective hydrolysis of amides *via* electroreduction

Jin-Yu He, Yan-Zhao Wang, Wen-Xi Duan, Jia-Rong Li, Hao Xu\* and Cuiju Zhu\*

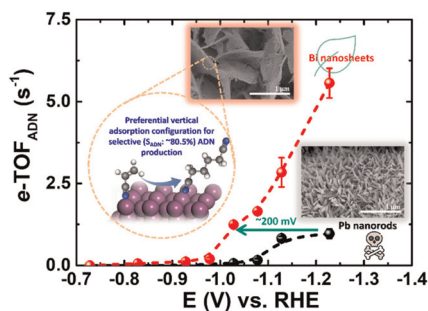
## PAPERS

8211

Optimization of 5-hydroxymethylfurfural oxidation *via* photo-enzymatic cascade process

Marcelo A. do Nascimento, Bernardo Haber, Mauro R. B. P. Gomez, Raquel A. C. Leão, Mariusz Pietrowski, Michał Zieliński, Rodrigo O. M. A. de Souza, Robert Wojcieszak\* and Ivaldo Itabaiana, Jr\*

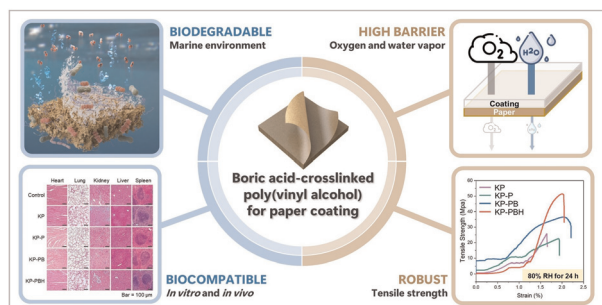
8220



## Efficient and selective electrosynthesis of adiponitrile by electrohydrodimerization of acrylonitrile over a bismuth nanosheet modified electrode

Jia-Sheng Su, Shih-Ching Huang, Ming-Chi Tsai, Chia-Hui Yen and Chia-Yu Lin\*

8230



## Boric acid-crosslinked poly(vinyl alcohol): biodegradable, biocompatible, robust, and high-barrier paper coating

Shinhyeong Choe, Seulki You, Kitae Park, Youngju Kim, Jehee Park, Yongjun Cho, Jongchul Seo, Hanseul Yang and Jaewook Myung\*

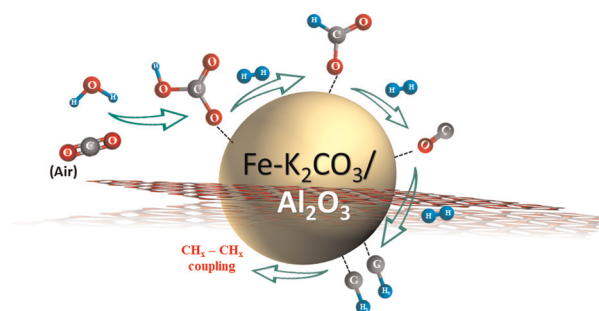


## PAPERS

8242

# Reactive direct air capture of CO<sub>2</sub> to C–C coupled products using multifunctional materials

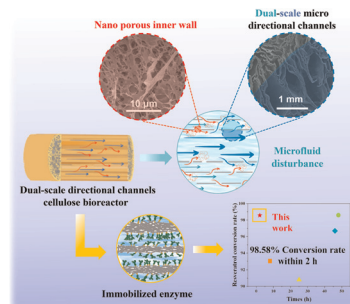
Shazia Sharmin Satter, Johnny Saavedra Lopez, Michael L. Hubbard, Yuan Jiang, Robert A. Dagle and Jotheeswari Kothandaraman\*



8256

# Wood-inspired dual-scale directional channel cellulose bioreactors with high mass transfer efficiency for continuous flow catalytic green conversion

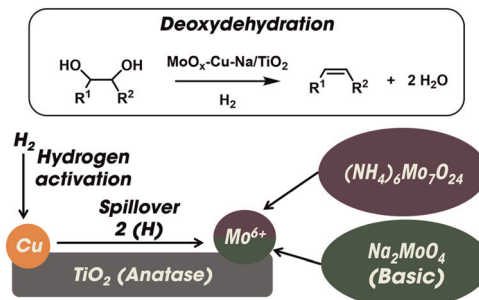
En-Jiang Liu, Yu-Shi Shen, Mei-Yan Ling, Chen-Xi He, Xing Zhou, Jun Wang, Shuai You, Wei-Guo Zhao, Xiao-Hui Yao and Dong-Yang Zhang\*



8267

# Non-noble metal heterogeneous catalysts for hydrogen-driven deoxydehydration of vicinal diol compounds

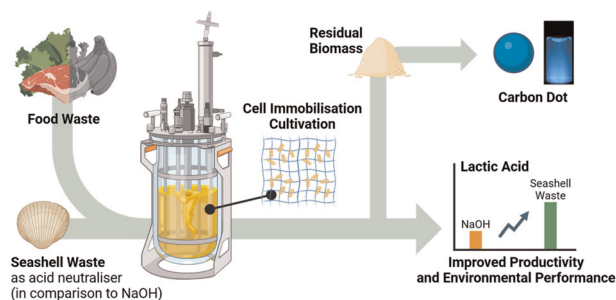
Jianxing Gan, Yoshinao Nakagawa,\* Mizuho Yabushita and Keiichi Tomishige\*



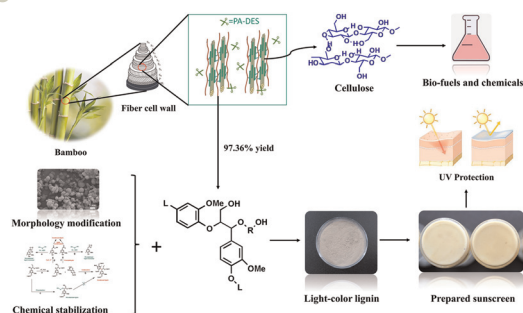
8282

# Green synthesis of lactic acid and carbon dots using food waste and seashell waste

Jin-Hua Mou, Ling-Feng Ouyang, Zi-Hao Qin, Ya-Hui Miao, Xin-Tian Jiang, Mui-Choo Jong, Man-Chung Tang, Chenyu Du, Season Si Chen\* and Carol Sze Ki Lin\*



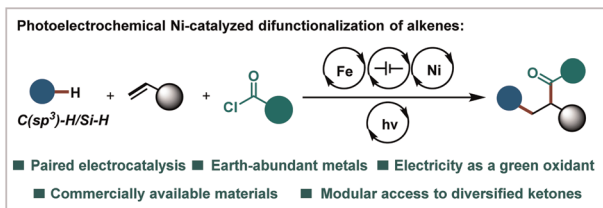
8298



### Low-chromophore lignin isolation from natural biomass with polyol-based deep eutectic solvents

Jinyuan Cheng, Xuelian Zhou, Caoxing Huang, Chang Geun Yoo, Xianzhi Meng, Guigan Fang,\* Arthur J. Ragauskas and Chen Huang\*

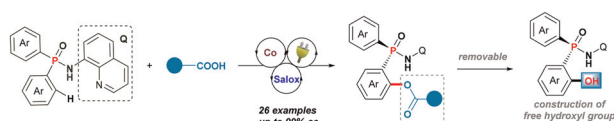
8315



### Photoelectrochemical nickel-catalyzed carboacylation/silanoylation of alkenes with unactivated C/Si–H bonds

Lanfen Wang, Xiangyu Huo, Xiaozhi He, Lutz Ackermann\* and Dingyi Wang\*

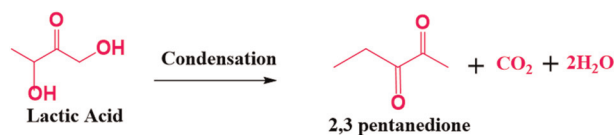
8323



### Electrochemically enabled cobalt catalyzed enantioselective C–H acyloxylations of aryl phosphamides with carboxylic acid

Xuying Xia, Changdi Zheng, Yunfei Hang, Jiyuan Guo, Tao Liu, Dingguo Song, Zhiwei Chen, Weihui Zhong and Fei Ling\*

8330



### Highly efficient production of 2,3-pentanedione from condensation of bio-derived lactic acid over polymorphic ZrO<sub>2</sub>

Neha Dhiman, B. Moses Abraham, Deepti Agrawal, Sudhakara Reddy Yenumala, Jyoti Porwal and Bipul Sarkar\*



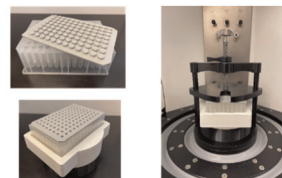
## PAPERS

8341

### Nickel-catalyzed cross-coupling aminations via high-throughput mechanochemistry enabled by resonant acoustic mixing

Alice Nanni, Deshen Kong, Chen Zhu and Magnus Rueping\*

- ✓ Media-free mixing
- ✓ Reliable and safe
- ✓ Easy scale-up
- ✓ 96-well plate compatible
- ✓ suitable for HTE



8348

### Steam-assisted electro-reduction of NiO: a sustainable alternative to conventional hydrogen reduction

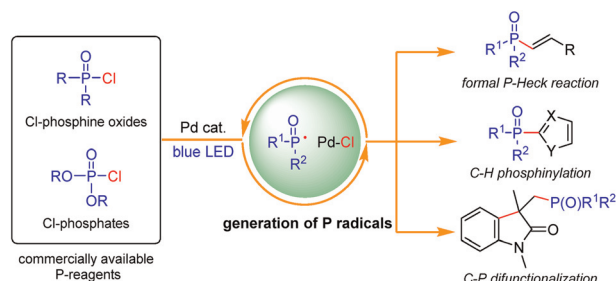
Kaiyu Xie and Ali Reza Kamali\*



8360

### A general platform for phosphorylation reactions enabled by photoinduced palladium catalysis

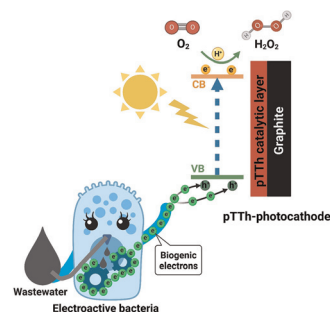
Yu-Jie Zhang, Xue-Song Wang, Jian Cao\* and Li-Wen Xu\*



8367

### Novel bio-solar hybrid photoelectrochemical synthesis for selective hydrogen peroxide production

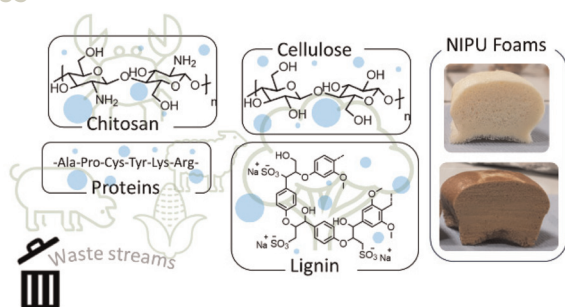
Rusen Zou, Babak Rezaei, Xiaoyong Yang, Wenjing Zhang, Stephan Sylvest Keller and Yifeng Zhang\*





## PAPERS

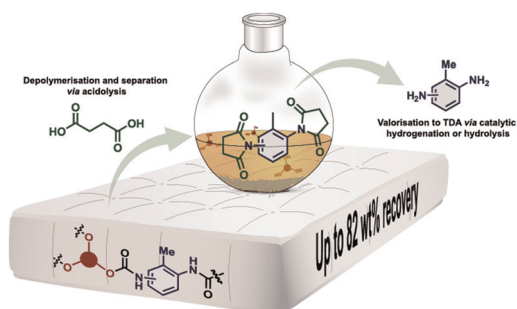
8383



### Valorization of waste biomass for the fabrication of isocyanate-free polyurethane foams

Dagmara Trojanowska, Florent Monie, Giovanni Perotto,\*  
Athanasia Athanassiou, Bruno Grignard, Etienne Grau,  
Thomas Vidil, Henri Cramail\* and  
Christophe Detrembleur\*

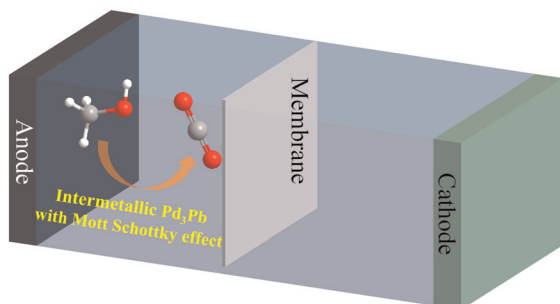
8395



### Chemical separation of polyurethane via acidolysis – combining acidolysis with hydrolysis for valorisation of aromatic amines

Thomas B. Bech, Bjarke S. Donslund,  
Steffan K. Kristensen\* and Troels Skrydstrup\*

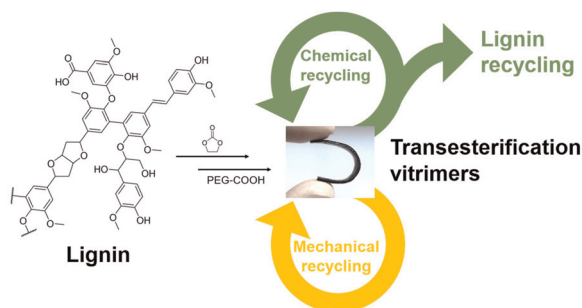
8405



### Ultrafine Pd<sub>3</sub>Pb intermetallic nanowires with Mott–Schottky effect achieve a complete oxidation pathway for methanol oxidation catalysis

Shuanglong Zhou, Zuochao Wang, Mo Zhang,  
Xiaoming Mou, Yu Dai, Lei Wang and Jianping Lai\*

8414



### Turning lignin into a recyclable bioresource: transesterification vitrimers from lignins modified with ethylene carbonate

Antoine Duval,\* Wissam Benali and Luc Avérous\*





## CORRECTION

8428

**Correction: Comparative environmental assessment of zeolites synthesized from chemicals and natural minerals**

Xiaoling Chen, Guoxi Xiao, Tiesen Li,\* Chan Wang, Qingyan Cui, Xiaojun Bao and Yuanyuan Yue\*

