

# Green Chemistry

Cutting-edge research for a greener sustainable future

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ISSN 1463-9262 CODEN GRCHFJ 25(19) 7397–7828 (2023)



### Cover

See Zhenfeng Bian, Hexing Li, Yinghong Yue *et al.*, pp. 7518–7523.

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### Inside cover

See Shū Kobayashi *et al.*, pp. 7524–7528.

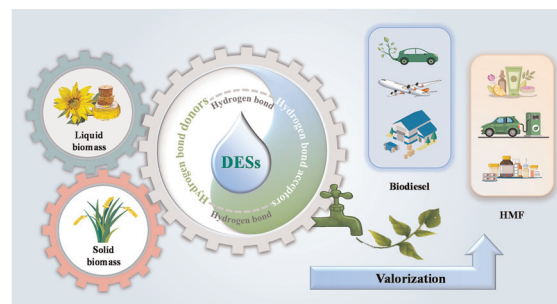
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## CRITICAL REVIEWS

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### Deep eutectic solvents for catalytic biodiesel production from liquid biomass and upgrading of solid biomass into 5-hydroxymethylfurfural

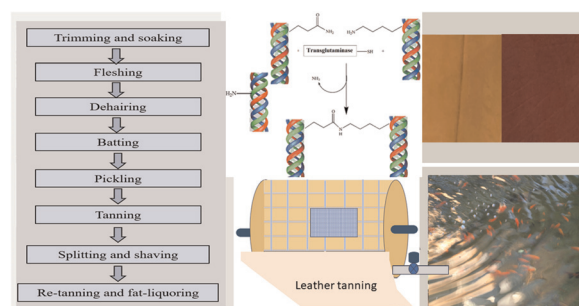
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Mohammad Mahbubul Hassan,\* Jane Harris, James J. C. Busfield and Emiliano Bilotti



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# Green Chemistry

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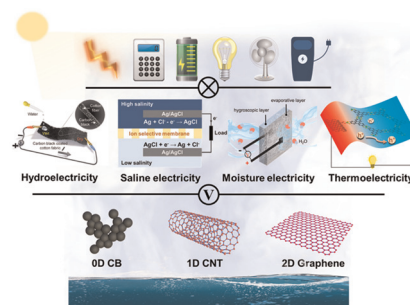


## TUTORIAL REVIEWS

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**Carbon materials for hybrid evaporation-induced electricity generation systems**

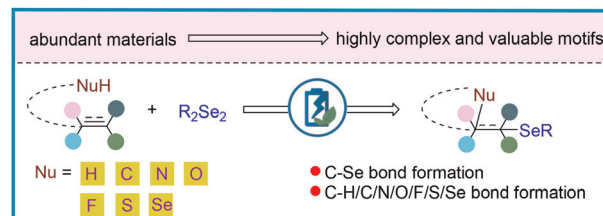
Can Ge, Duo Xu, Yan Qian, Heng Du, Chong Gao, Zhuoer Shen, Zhe Sun and Jian Fang\*



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**Recent progress in the electrochemical selenofunctionalization of alkenes and alkynes**

Pei Qu, You-Qin Jiang, Yong-Hao Wang and Gong-Qing Liu\*

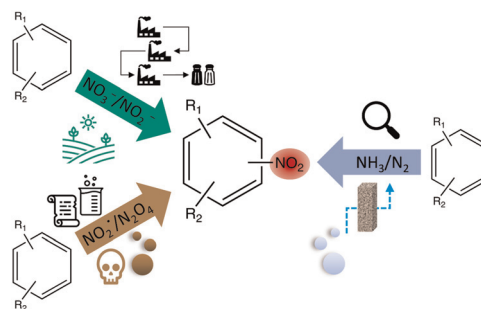


## PERSPECTIVE

7508

**Electrochemical nitration for organic C–N bond formation: a current view on possible N-sources, mechanisms, and technological feasibility**

Nils Kurig\* and Regina Palkovits

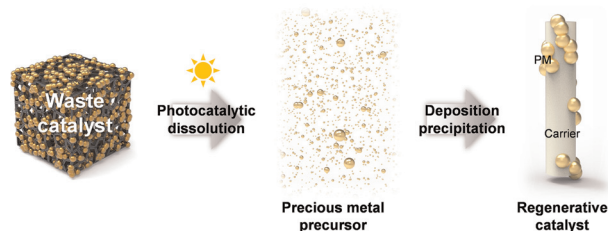


## COMMUNICATIONS

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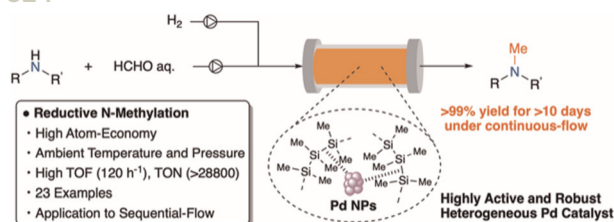
**Precious metal catalyst recycling through photocatalytic dissolution**

Yao Chen, Huan He, Shuyang Xu, Zhengxi Zou, Weiming Hua, Zhenfeng Bian,\* Hexing Li\* and Yinghong Yue\*



## COMMUNICATIONS

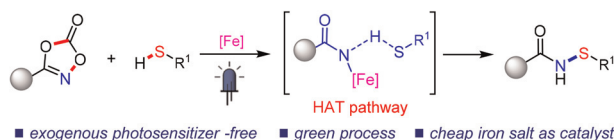
7524



### Continuous-flow reductive *N*-methylation with highly active heterogeneous Pd catalysts and sequential-flow synthesis of *N*-monomethyl amines

Yuki Saito, Taisei Senzaki, Ken Nishizawa and Shū Kobayashi\*

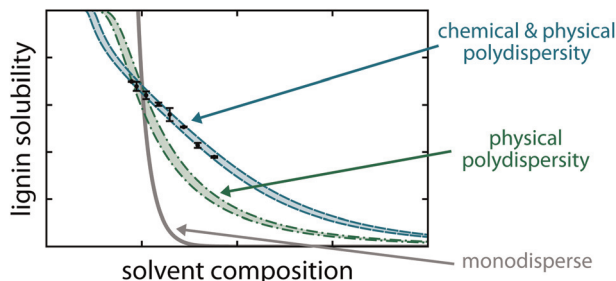
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### Visible-light-induced iron-catalyzed S–N cross-coupling of thiols with dioxazolones

Jing-Jing Tang, Ning Yan, Yiwei Zhang, Yi Wang, Ming Bao and Xiaoqiang Yu\*

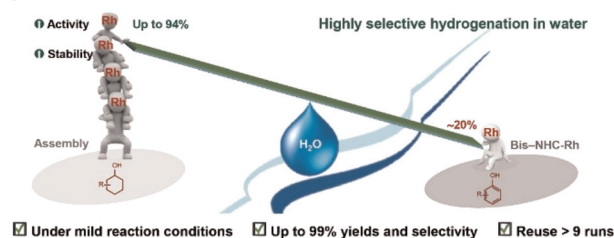
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### Quantitative prediction of the solvent fractionation of lignin

Stijn H. M. van Leuken, Dannie J. G. P. van Osch, Panos D. Kouris, Yawen Yao, Monika A. Jedrzejczyk, Geert J. W. Cremers, Katrien V. Bernaerts, Rolf A. T. M. van Benthem, Remco Tuinier, Michael D. Boot, Emiel J. M. Hensen\* and Mark Vis\*

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### Selective hydrogenation of phenols to cyclohexanols catalyzed by robust solid NHC–Rh coordination assemblies in water

Jie Chen, Jiale Ji and Tao Tu\*

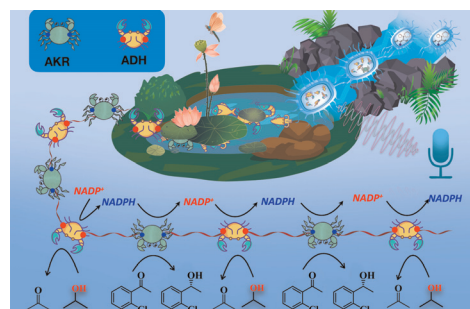


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### Designing an enzyme assembly line for green cascade processes using bio-orthogonal chemistry

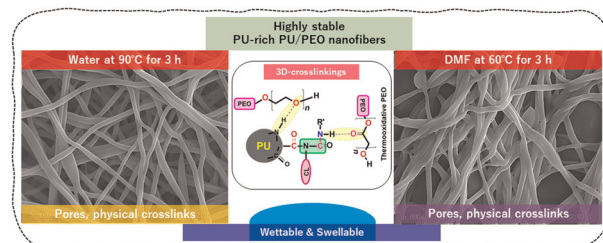
Li Qiao, Zhiyuan Luo, Ru Wang, Xiaolin Pei, Shujiao Wu, Haomin Chen, Tian Xie,\* Roger A. Sheldon\* and Anming Wang\*



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### Water-based eco-friendly fabrication of physicochemically crosslinked and highly wettable PU-rich electrospun PU/PEO nanofiber composites with exceptional chemical and thermal stability

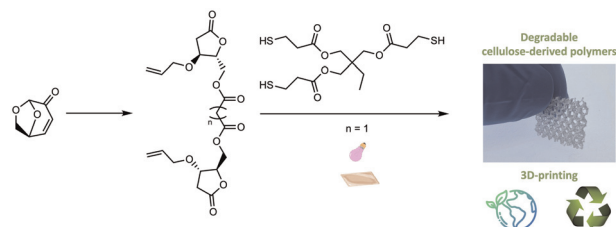
Osamu Ohsawa, Gopiraman Mayakrishnan, Yan Ge, Chunhong Zhu, Kei Watanabe\* and Ick Soo Kim\*



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### Levoglucosenone to 3D-printed green materials: synthesizing sustainable and tunable monomers for eco-friendly photo-curing

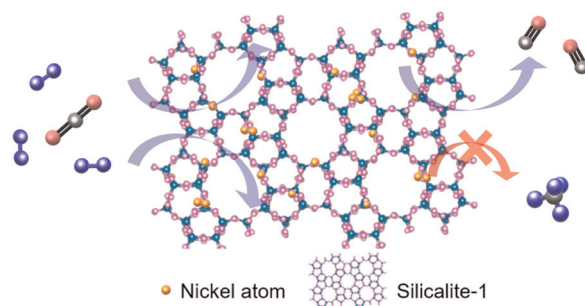
Amandine L. Flourat, Lorenzo Pezzana, Sabrina Belgacem, Abdouramane Dosso, Marco Sangermano, Sami Fadlallah\* and Florent Allais\*



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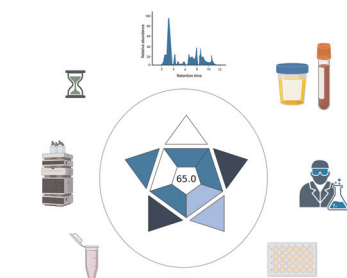
### Reversal of methanation-oriented to RWGS-oriented Ni/SiO<sub>2</sub> catalysts by the exsolution of Ni<sup>2+</sup> confined in silicalite-1

Chia-Hung Chen, Hong-Kai Chen, Wei-Hsiang Huang, Chi-Liang Chen, Kittisak Choojun, Tawan Sooknoi, Hong-Kang Tian\* and Yu-Chuan Lin\*





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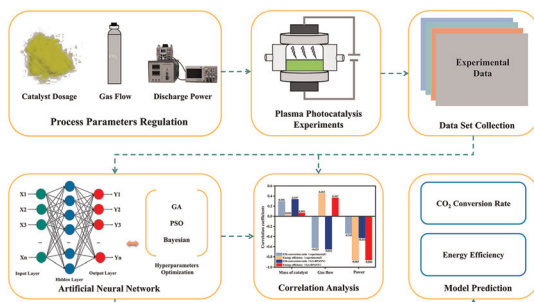


Blue Applicability Grade Index (BAGI)

### Blue applicability grade index (BAGI) and software: a new tool for the evaluation of method practicality

Natalia Manousi, Wojciech Wojnowski, Justyna Płotka-Wasyłka and Victoria Samanidou\*

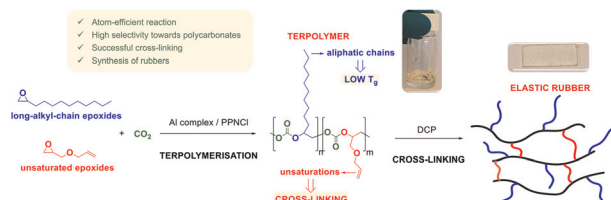
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### Machine learning for CO<sub>2</sub> conversion driven by dielectric barrier discharge plasma and Cs<sub>2</sub>TeCl<sub>6</sub> photocatalysts

Yangyi Shen, Chengfan Fu, Wen Luo, Zhiyu Liang, Zi-Rui Wang\* and Qiang Huang\*

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### Novel elastic rubbers from CO<sub>2</sub>-based polycarbonates

Giulia Chiarioni, Martin van Duin and Paolo P. Pescarmona\*

7627



**Conditions A:** K<sub>2</sub>CO<sub>3</sub>, DMAc, with or without 18-crown-6, rt-100 °C for most of electron-deficient aryl halides (Cl, Br)

**Conditions B:** 1-5 mol% copper salt and oxalic diamide, t-BuOK, dioxane, 30-130 °C

for most of electron-rich (hetero)aryl halides (Cl, Br, I)

### Assembly of (hetero)aryl thioethers via simple nucleophilic aromatic substitution and Cu-catalyzed coupling reactions with (hetero)aryl chlorides and bromides under mild conditions

Weiqi Liu, Xinghao Jin and Dawei Ma\*

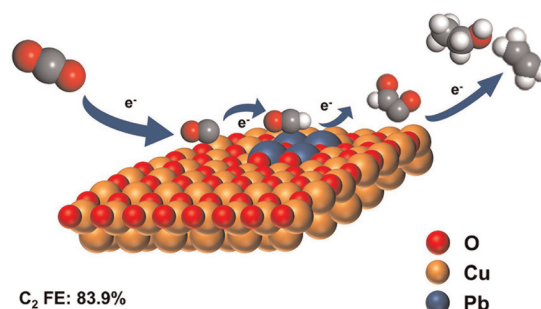


## PAPERS

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### Stabilizing Cu<sup>0</sup>–Cu<sup>+</sup> sites by Pb-doping for highly efficient CO<sub>2</sub> electroreduction to C<sub>2</sub> products

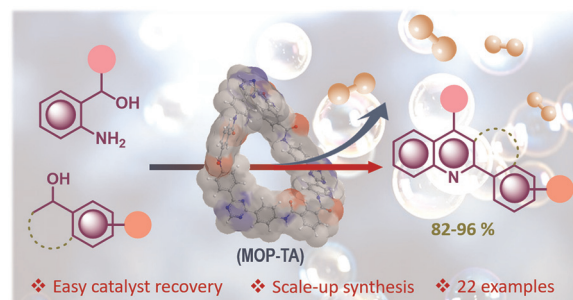
Xiaodong Ma, Xinning Song, Libing Zhang, Limin Wu, Jiaqi Feng, Shunhan Jia, Xingxing Tan, Liang Xu, Xiaofu Sun\* and Buxing Han\*



7642

### Metal-free reusable hollow-spherical triazine microporous organic polymer supported quinolines synthesis via hydrogen evolution

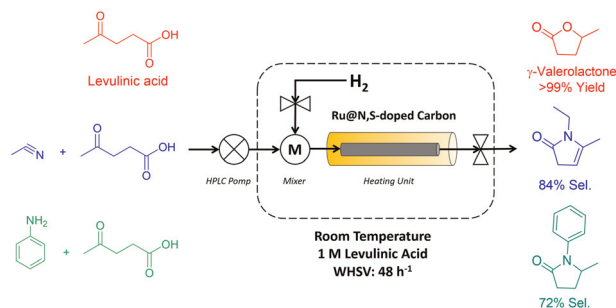
Debabrat Pathak, Bikash Kumar Kalita, Ashish Sarmah, Himanshu Sharma, Bidisha Bora, Tridib K. Goswami and Bipul Sarma\*



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### Room temperature continuous flow synthesis of $\gamma$ -valerolactone and N-containing heterocycles over Ru supported bimodal N,S-doped cubic mesoporous carbon

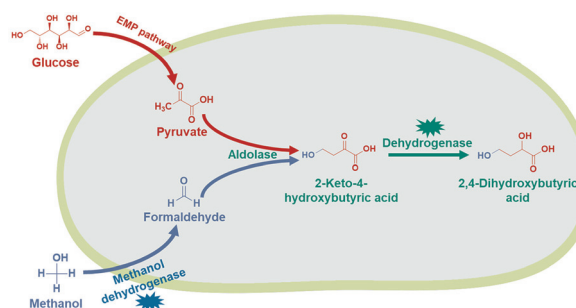
Hamzeh H. Veisi, Babak Karimi,\* Mohsen Heydari and Rafael Luque\*



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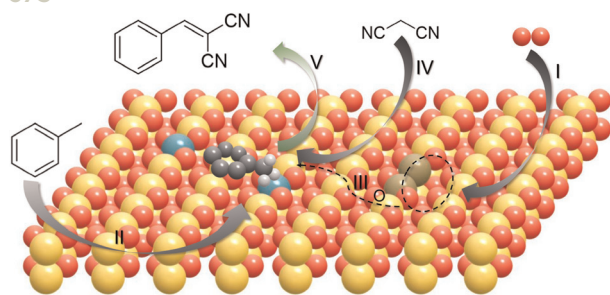
### Highly efficient biosynthesis of 2,4-dihydroxybutyric acid by a methanol assimilation pathway in engineered *Escherichia coli*

Xianjuan Dong, Chao Sun, Jing Guo, Xiangyu Ma, Mo Xian\* and Rubing Zhang\*



## PAPERS

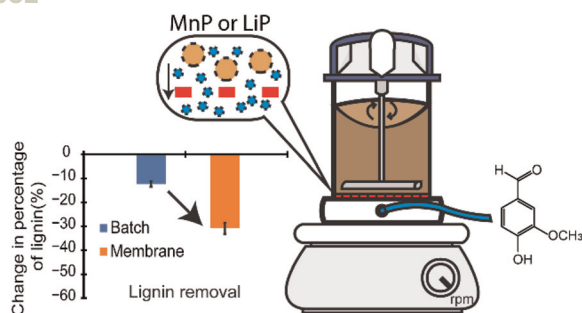
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### Dual active-sites of Co and oxygen vacancies in Co-doped CeO<sub>2</sub>-catalyzed toluene oxidation for the subsequent Knoevenagel condensation process

Yong Zou, Yuxuan Liu, Sai Zhang\* and Yongquan Qu\*

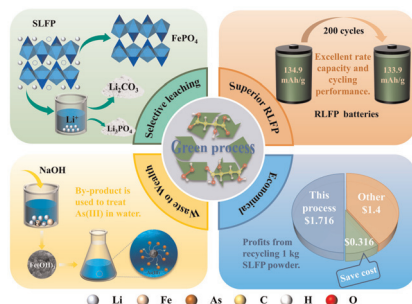
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### Enhanced depolymerization of beech wood lignin and its removal with peroxidases through continuous separation of lignin fragments

Kenneth Sze Kai Teo, Keiko Kondo, Kaori Saito, Yu Iseki, Takashi Watanabe, Takashi Nagata\* and Masato Katahira\*

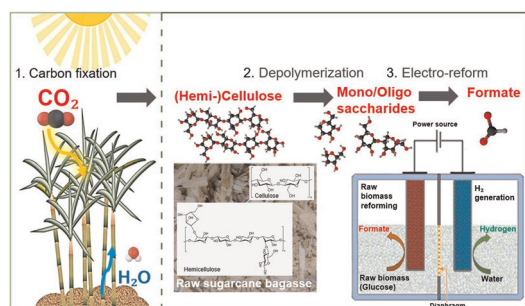
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### Integrated recycling of valuable elements from spent LiFePO<sub>4</sub> batteries: a green closed-loop process

Huixiang Zhou, Yun Zhang, Liqing Li and Zhanfang Cao\*

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### Green hydrogen generation assisted by electroreforming of raw sugarcane bagasse waste

Li Quan Lee, Hu Zhao, Tian Yee Lim, Ge Junyu, Ovi Lian Ding, Wen Liu\* and Hong Li\*



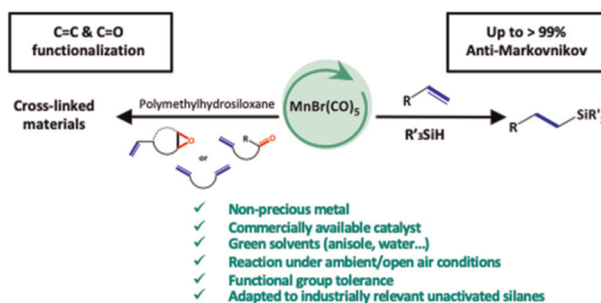


## PAPERS

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### MnBr(CO)<sub>5</sub>: a commercially available highly active catalyst for olefin hydrosilylation under ambient air and green conditions

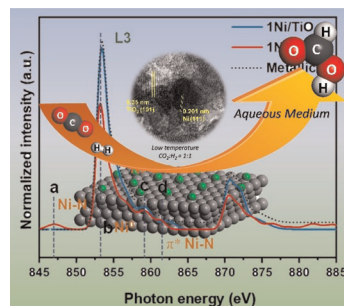
Anthony Vivien, Laurent Veyre, Raphaël Mirgalet, Clément Camp and Chloé Thieuleux\*



7729

### Ni–N synergy enhanced the synthesis of formic acid via CO<sub>2</sub> hydrogenation under mild conditions

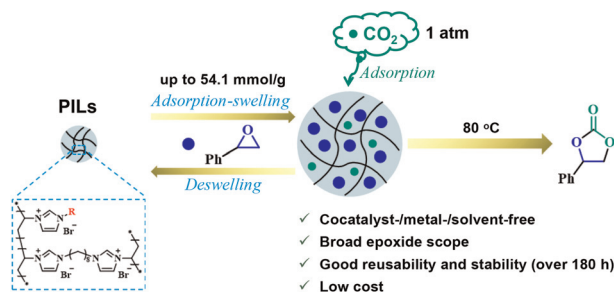
Jyotishman Kaishyop, Tuhin Suvra Khan, Satyajit Panda, Pranay Rajendra Chandewar, Debaprasad Shee, Tulio C. R. Rocha, Flavio C. Vicentin and Ankur Bordoloi\*



7743

### Poly(ionic liquid)s with unique adsorption-swelling ability toward epoxides for efficient atmospheric CO<sub>2</sub> conversion under cocatalyst-/metal-/solvent-free conditions

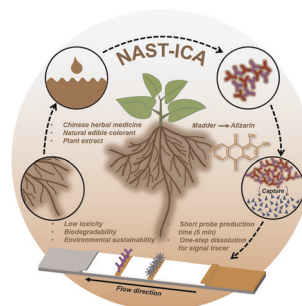
Bihua Chen, Shiguo Zhang\* and Yan Zhang\*



7756

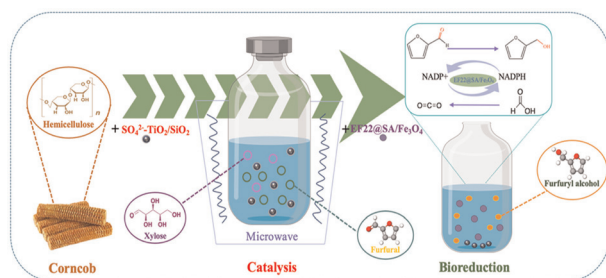
### Natural dye-mediated signal tracer strategy: a green route for ultra-efficient immunochromatographic detection of antibiotics

Shaochi Wang, Ting Du, Junqi Huangmin, Sijie Liu, Ying Zhu, Daohong Zhang, Jing Sun, Yanru Wang,\* Lintao Zeng\* and Jianlong Wang\*



## PAPERS

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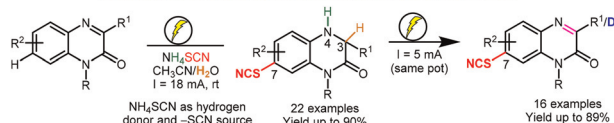


### Enhanced upgrading of corncob to furfuryl alcohol with a novel silica-supported $\text{SO}_4^{2-}$ - $\text{TiO}_2$ chemo-catalyst and immobilized whole-cell biocatalyst

Qi Li, Ruiying Gao, Yi Zhang, Yufei Zhang, Tielang Liu, Yu-Cai He\* and Ming-Ming Zheng\*

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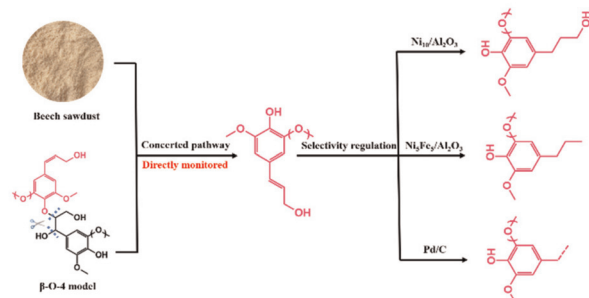
Electrochemical Cascade Sequences: Reduction, thiocyanation, and Oxidation



### Electrochemical cascade sequences for remote C7–H bond thiocyanation of quinoxalin-2(1H)-ones with ammonium thiocyanate

Rajib Maity,\* Abhijit Bankura and Indrajit Das\*

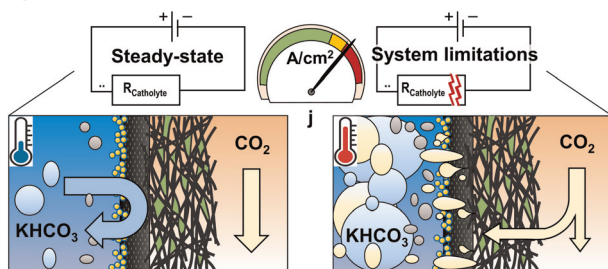
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### $\text{Ni}_5\text{Fe}_5/\text{Al}_2\text{O}_3$ catalytic hydrogenolysis of lignin: mechanism investigation and selectivity regulation

Zhensheng Shen, Wei Wang, Lun Pan, Zhenfeng Huang, Xiangwen Zhang, Chengxiang Shi\* and Ji-Jun Zou\*

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### $\text{CO}_2$ flow electrolysis – limiting impact of heat and gas evolution in the electrolyte gap on current density

Christina Martens,\* Bernhard Schmid,\* Hermann Tempel and Rüdiger-A. Eichel

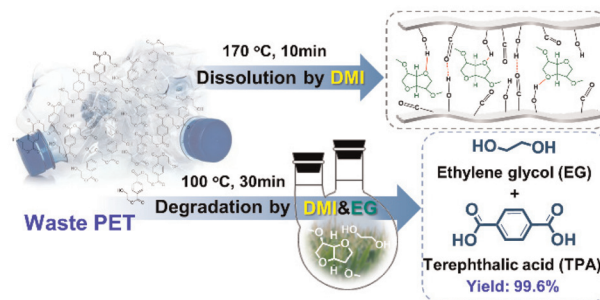


## PAPERS

7807

### Biobased dimethyl isosorbide as an efficient solvent for alkaline hydrolysis of waste polyethylene terephthalate to terephthalic acid

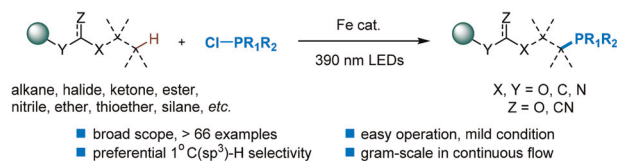
Haitao Yu, Yang Wang, Lan Chen, Chenyang Wei, Tiancheng Mu and Zhimin Xue\*



7817

### Photoinduced ligand-to-iron charge transfer enabled C(sp<sup>3</sup>)–H phosphorylation of hydrocarbons

Wei Shi, Ping-Fu Zhong, Xu-Kuan Qi, Chao Yang, Lin Guo\* and Wujiong Xia\*



## CORRECTION

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### Correction: Surprisingly fast assembly of the MOF film for synergetic antibacterial phototherapeutics

Jie Gao, Lingwan Hao, Rujian Jiang, Zhuo Liu, Limei Tian, Jie Zhao,\* Weihua Ming and Luquan Ren

