

Green Chemistry

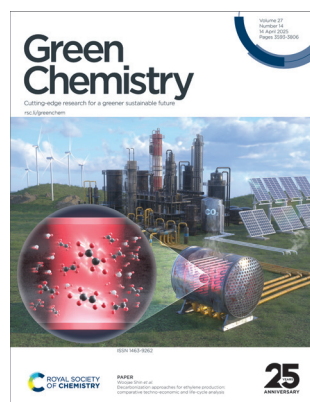
Cutting-edge research for a greener sustainable future

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(14) 3593–3806 (2025)



Cover

See Woojae Shin *et al.*,
pp. 3655–3675.

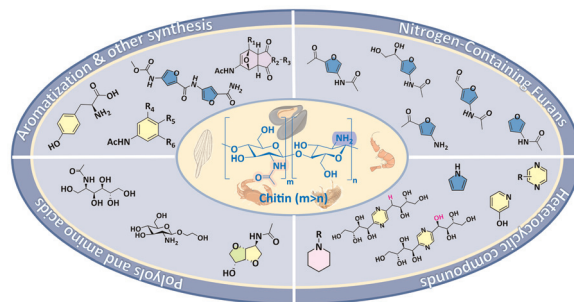
Image reproduced by
permission of Woojae Shin
from *Green Chem.*, 2025, **27**,
3655.

TUTORIAL REVIEW

3601

Organonitrogen platform chemicals and pharmaceutical precursors: a perspective on sustainable chitin utilization

Ting Wang, Junnan Wei* and Peter J. Deuss*

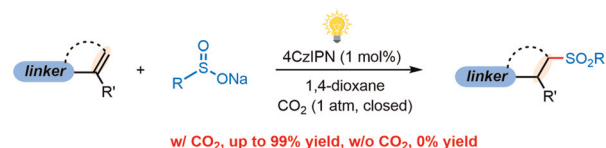


COMMUNICATIONS

3627

CO₂-Promoted photoredox-catalyzed hydrosulfonation of alkenes with sulfinates

Wanhui Huang, Ge Liu, Fangyuanhang Yang, Yuxi Ren,
Yuzhen Gao* and Weiping Su*



linker = halogen, alcohol, acid, ester, amide, ether, silical, boric acid and alkenyl

- CO₂-accelerated sulfonation
- compatible with unactivated alkenes
- tolerance with broad function groups
- metal-free and equivalent reagent-free

EES Catalysis

GOLD
OPEN
ACCESS

**Exceptional research on energy
and environmental catalysis**

Open to everyone. Impactful for all

rsc.li/EESCatalysis

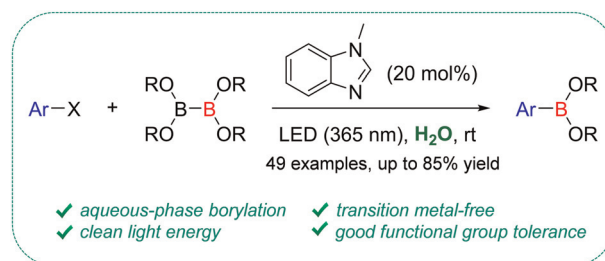
**Fundamental questions
Elemental answers**

COMMUNICATIONS

3634

Photoinduced transition metal-free borylation of aryl halides in an aqueous phase

Mengqi Liu, Wan-Min Cheng, Zi-Long Li, Hong Jiang* and Jimei Ma*



3640

A H₂-free heterogeneous route to glycerol-based acrylics via Re-based deoxydehydration

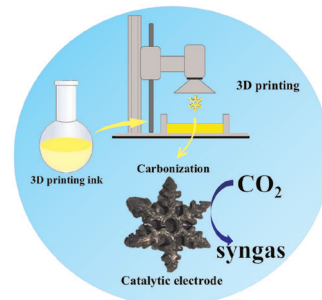
Maja Gabrič, Florian M. Harth, Brigita Hočevár, Sašo Gyergyek, Blaž Likozar and Miha Grilc*



3646

A 3D printed, metal-free, carbon-based catalytic electrode for converting CO₂ into syngas

Na Zhao, Kai Zhao, Han Zhang, Jiangyu Sheng, Shasha Feng and Wei Wang*

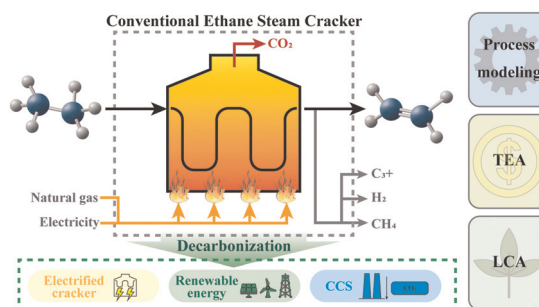


PAPERS

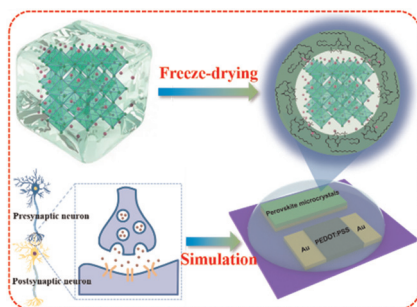
3655

Decarbonization approaches for ethylene production: comparative techno-economic and life-cycle analysis

Woojae Shin, Bosong Lin, Haoxiang Lai, Gasim Ibrahim and Guiyan Zang*



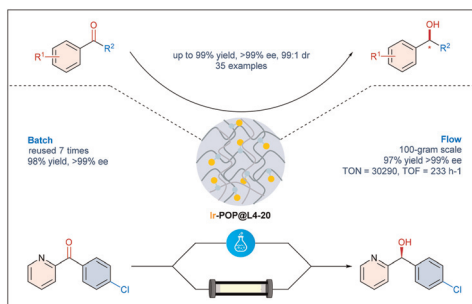
3676



Ice-confined synthesis of lecithin-protected perovskite microcrystals for stable optical synapses

Zongyang Li, Yubo Peng, Jianlong Ji, Yuxuan Cheng, Jie Li, Ying Sun, Min Zhao,* Xudong Jin,* Huayun Du* and Yuying Hao*

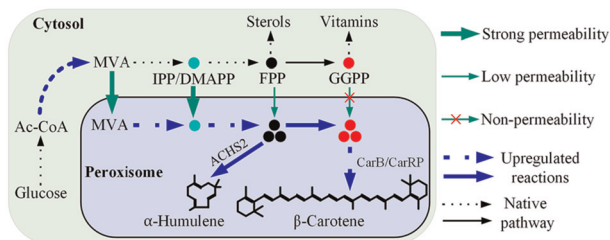
3684



Development of a heterogeneous P-N-N tridentate ligand for iridium-catalyzed asymmetric hydrogenation of ketones in batch and flow

Lizhou Zheng, Weiqi Feng, Chen Chen, Ke Feng, Dingguo Song, Yirui Chen, Feiyang Shen, Xianghua Zhao, Fei Ling* and Weihui Zhong*

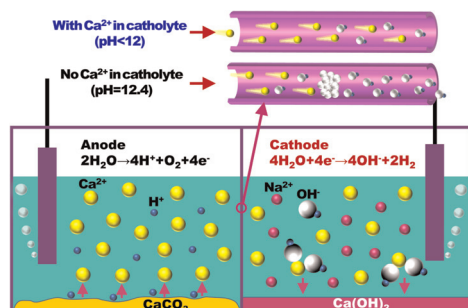
3693



Cytoplasmic-peroxisomal spatial combination engineering in *Candida tropicalis* for enhanced terpenoid production

Lihua Zhang, Cheng Fan, Haibing Zhang, Manzhi Zhu, Haiquan Yang, Yuanyuan Xia, Wei Shen and Xianzhong Chen*

3706



Electrolyte pH modulation for efficient and durable electrochemical cement clinker precursor production

Lei Xu, Lei Liu,* Zheng Fang, Min Chen, Guangfeng Ou, Michio Suzuki and Yuya Sakai

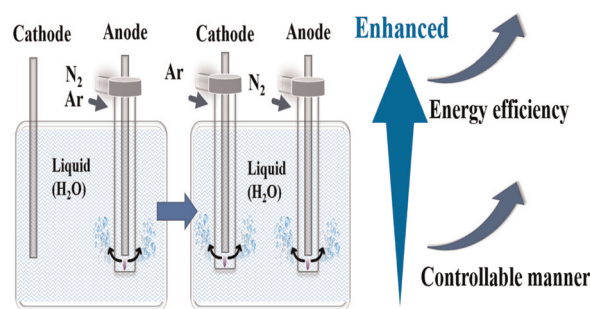


PAPERS

3715

Energy-efficient production of plasma-activated water: insights into controllable peroxyxynitrite chemistry

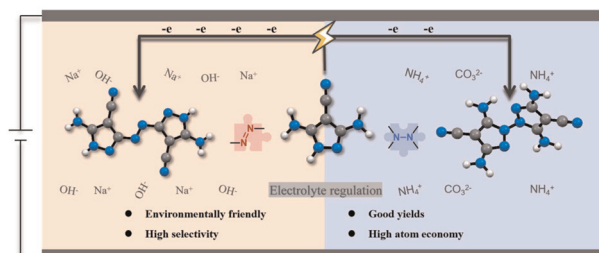
Dingwei Gan, Longfei Hong, Shuai Yuan, Mengying Zhu, Yuting Gao, Tianqi Zhang, Tianyu Li, Bohan Chen, Anna Dzimitrowicz, Piotr Jamroz, Patrick J. Cullen and Renwu Zhou*



3727

Site-selective electrochemical synthesis of nitrogen-enriched bis-pyrazole derivatives: a sustainable approach for N–N versus N=N bond formation

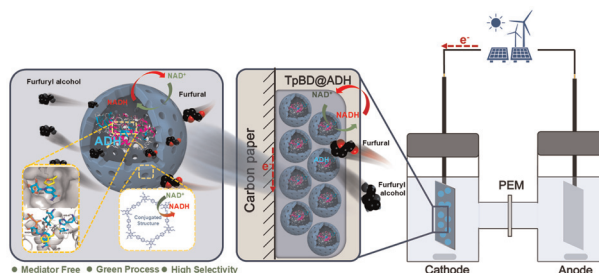
Lei Liu, Wengzhe Huang, Ye Yuan, Lu Lu, Yongxing Tang* and Wei Huang*



3733

A mediator-free enzyme carbonaceous cathode for bioelectrocatalytic reduction of furfural to furfuryl alcohol

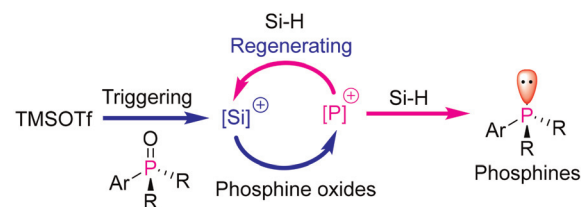
Shize Zheng, Chenxi Zhang, Peng Zhan, Xiangshi Liu, Houchao Shan, Yong Wang, Bin Wang,* Peiyong Qin, Di Cai* and Tianwei Tan



3743

General and chemoselective reduction of phosphine oxides by an enhanced oxophilic competition mechanism

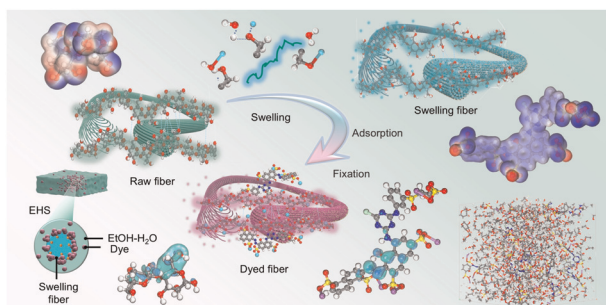
Mengyao You, Ziwei Zhang, Chao Chen, Zhichao Mei, Xinxin Zhang, Jiang Bai, Haiyang Huang* and Qiang Xiao*



- ◆ Cheap silanes as reducing agents ◆ Mild conditions
- ◆ Highly chemoselectivity ◆ Readily available catalyst



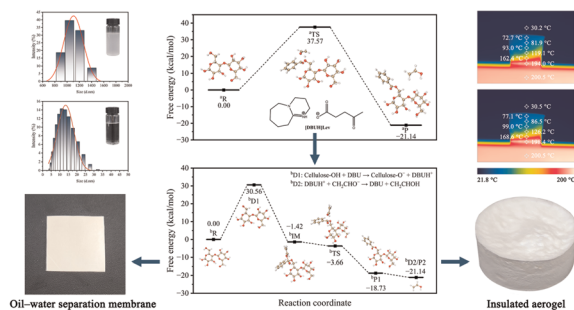
3751



Environmentally friendly salt-free and low-alkaline coloration of lyocell fibers in an ethanol–water mixture with excellent exhaustion

Wanjin Hu, Xiaofeng Wang, Mengyao Cai, Chunhua Zhang, Dandan Zhong, Xuelin Wang, Yonghao Zhou, Liangjun Xia,* Sijie Zhou* and Weilin Xu

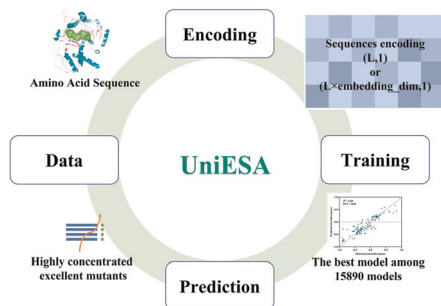
3764



Cellulose benzoate synthesis *via* homogeneous transesterification catalyzed by superbase-derived ionic liquids for advanced applications

Yuhui Ci, Xiangjian Yang, Yunqian Ma, Feng Xu* and Yanjun Tang*

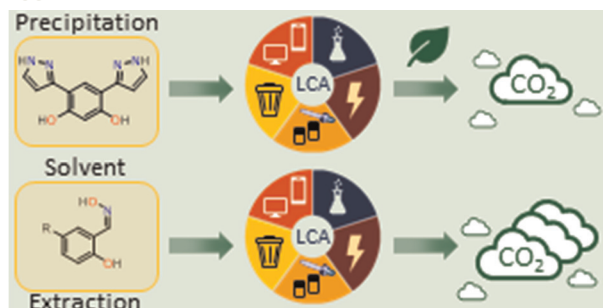
3777



UniESA: a unified data-driven framework for enzyme stereoselectivity and activity prediction

Chun-Yue Weng, Jun Li, Qi-Lin Chen, Jia-Yi Han, Zhi-Tao Dong, Zhi-Qiang Liu* and Yu-Guo Zheng

3789



Recovering copper from e-waste: recyclable precipitation *versus* solvent extraction with carbon emission assessment

Susanna S. M. Vance, Efthalia Chatzisyseon, Carole A. Morrison* and Jason B. Love*

