

Green Chemistry

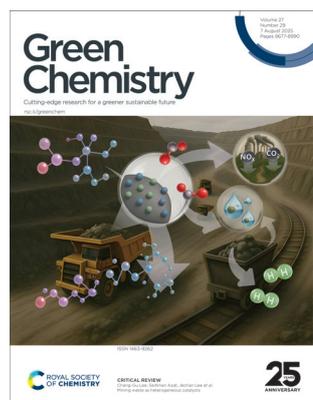
Cutting-edge research for a greener sustainable future

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(29) 8677–8990 (2025)



Cover
See Chang-Gu Lee, Seitkhan Azat, Jechan Lee et al., pp. 8691–8709.

Image reproduced by permission of Jechan Lee from *Green Chem.*, 2025, **27**, 8691.

Cover generated using the Google Gemini AI tool.



Inside cover
See Haibo Xie, Yuanlong Guo et al., pp. 8818–8831.

Image reproduced by permission of Haibo Xie from *Green Chem.*, 2025, **27**, 8818.

EDITORIAL

8686

25th Anniversary Celebration of *Green Chemistry*

Michael A. Rowan and Andrea Carolina Ojeda Porras

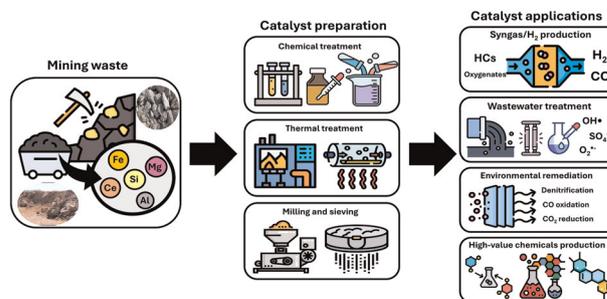


CRITICAL REVIEWS

8691

Mining waste as heterogeneous catalysts

Soo Lim Kim, Heejin Yang, Seonho Lee, Si-Kyung Cho, Chang-Gu Lee,* Seitkhan Azat* and Jechan Lee*



RSC Advances

At the heart of open access for
the global chemistry community

Editor-in-chief

Russell J Cox

Leibniz Universität Hannover, Germany

We stand for:



Breadth We publish work in all areas of chemistry and reach a global readership



Quality Research to advance the chemical sciences undergoes rigorous peer review for a trusted, society-run journal



Affordability Low APCs, discounts and waivers make publishing open access achievable and sustainable



Community Led by active researchers, we publish quality work from scientists at every career stage, and all countries

Submit your work now

rsc.li/rsc-advances

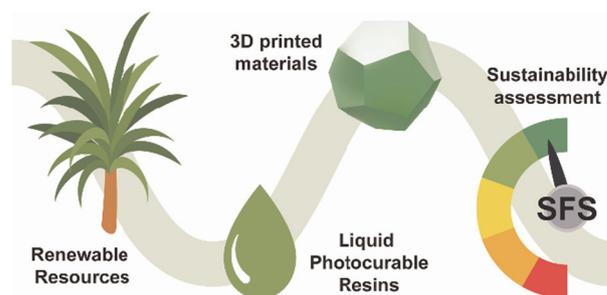
@RSC_Adv

CRITICAL REVIEWS

8710

Sustainable approaches in vat photopolymerization: advancements, limitations, and future opportunities

Mirko Maturi,* Erica Locatelli, Alberto Sanz de Leon, Mauro Comes Franchini and Sergio Ignacio Molina

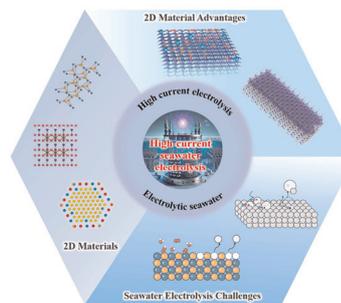


TUTORIAL REVIEWS

8755

Two-dimensional materials for high-current-density seawater electrolysis

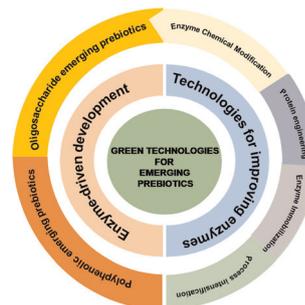
Liyun Wei, Jiao Dai, Shutong Qin, Mingjie Wang, Ziyuan Zhu, Weilin Xu, Kaisi Liu* and Jun Wan*



8777

Developing and improving enzyme-driven technologies to synthesise emerging prebiotics

Noelia Losada-Garcia, Milica Simović, Marija Ćorović, Ana Milivojević, Nikola Nikačević, Cesar Mateo,* Dejan Bezbradica* and Jose M. Palomo*

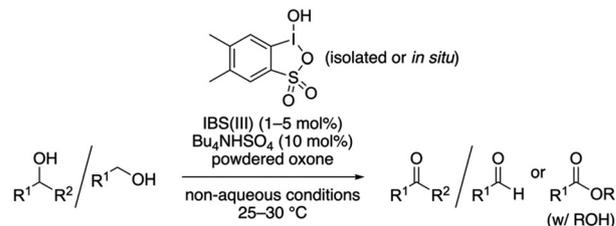


COMMUNICATIONS

8804

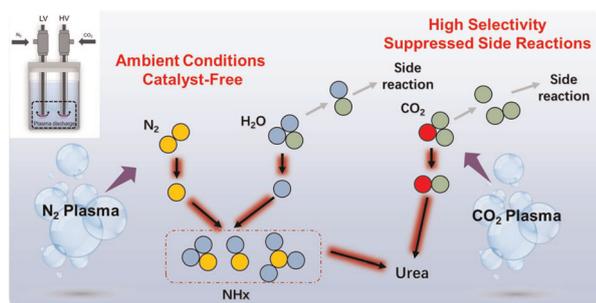
The low-temperature selective oxidation of alcohols and a one-pot oxidative esterification using an IBS(III/V)/oxone catalysis

Ryutarō Kondo, Muhammet Uyanik* and Kazuaki Ishihara*



COMMUNICATIONS

8811

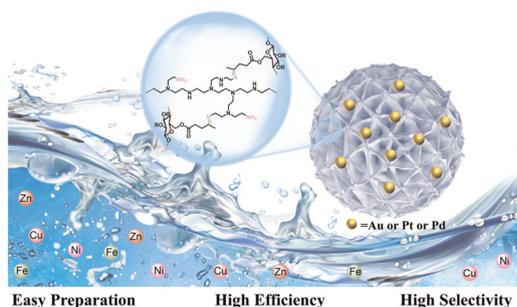


Catalyst-free urea synthesis via plasma-driven direct coupling of CO₂ and N₂ under ambient conditions

Dingwei Gan, Jingwen Huang, Longfei Hong, Haoxuan Jiang, Xiaoran Wang, Rusen Zhou, Jing Sun and Renwu Zhou*

PAPERS

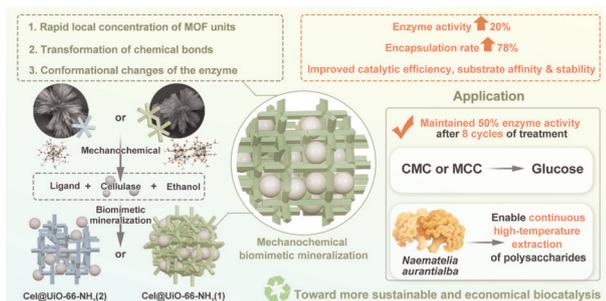
8818



Molecularly engineering cellulose into a functional cellulose-based aerogel adsorbent for the recovery of precious metals from e-waste

Yumei Chen, Chunhui Xie, Yang You, Tonghui Xu, Yunqi Li, Jili Yuan, Haibo Xie* and Yuanlong Guo*

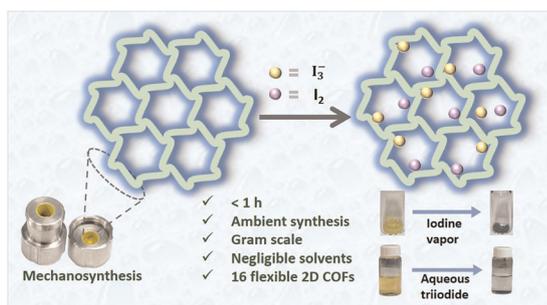
8832



Mechanochemical biomimetic mineralization of UiO-66-NH₂-immobilized cellulose for enhanced catalytic stability and efficiency

Xiaoyang Sun, Linyu Nian, Huimin Qi, Mengjun Wang, Dechun Huang and Chongjiang Cao*

8848



Ambient mechanosynthesis of flexible two-dimensional covalent organic frameworks

Yogendra Nailwal, Bryson Baker, Ziad Alsudairy, Mustapha El Hariri El Nokab, Qingsong Zhang, Tuo Wang, Songliang Cai, Yi Liu and Xinle Li*

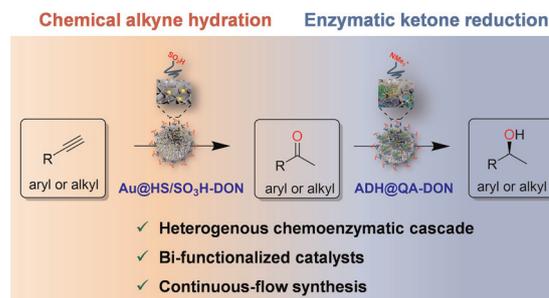


PAPERS

8858

Dual functionalization of mesoporous organosilicon nanoflowers enhances heterogeneous chemoenzymatic conversion of alkynes toward enantiopure alcohols

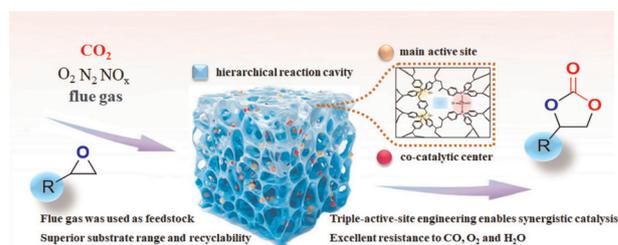
Chen Huang, Qian Zhang, Xiaoyang Yue,* Aidang Lu, Guanhua Liu, Ying He, Li Ma, Liya Zhou, Yunting Liu* and Yanjun Jiang*



8867

In situ capture and value-added utilization of CO₂ from flue gas using an ionic liquid polymer supported Zn catalyst

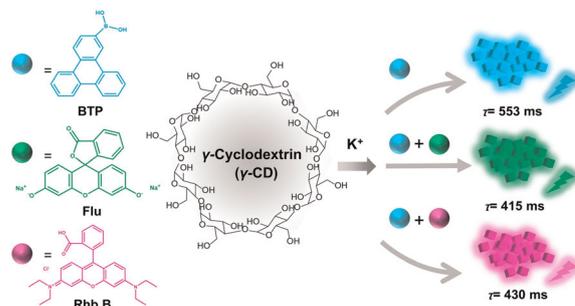
Hongyan Ni, Kang Zhao, Shujuan Liu, Xingchao Dai, Ce Liu, Xionghou Gao, Junyi Zhang, Honghai Liu, Kuo-Wei Huang, Xinjiang Cui* and Feng Shi*



8875

Multi-color-tunable ultra-long room temperature phosphorescence based on cyclodextrin metal-organic frameworks

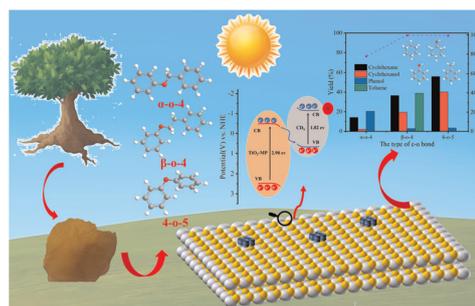
Jiayin Zhang, Jiaxuan Tang, Yongsheng Zhang, Yifu Chen* and Junbo Gong*



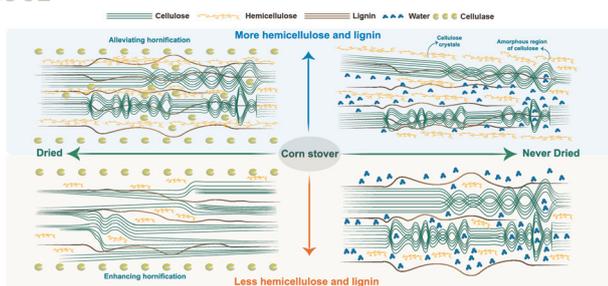
8883

A mesoporous TiO₂/carbon dot heterojunction photocatalyst efficiently cleaves entire types of C–O bonds in lignin under visible light

Song Han, Yun Zhao,* Mina Liang, Xiangxiang Zhai, Qi Zhang, Na Sun, Rong Ma, Guoling Li, Zhubing Xiao and Zhonghai Ni*



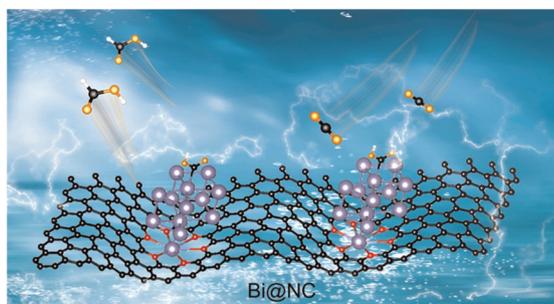
8901



Influence of hemicellulose and lignin on the effect of drying of cellulose and the subsequent enzymatic hydrolysis

Tian-Jie Ao, Jie Wu,* Richard Chandra,*
Huai-Yu Zhang, Yu-Feng Yuan, Yi-Ping Luo, Dong Li,
Chen-Guang Liu, Scott Renneckar and Jack Saddler

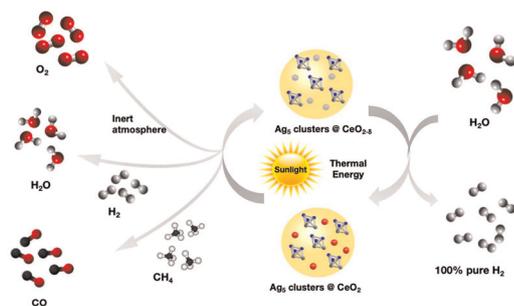
8914



MOF-derived Bi@NC electrocatalysts with heteroatomic engineering for high-efficiency CO₂-to-formate conversion

Jingxuan Song, Yuexian Du, Lu Liu, Kunfan Dong,
Ziyu Deng, Yanghe Fu,* Yijing Gao,* Fumin Zhang,
Fa Yang,* Weidong Zhu* and Maohong Fan

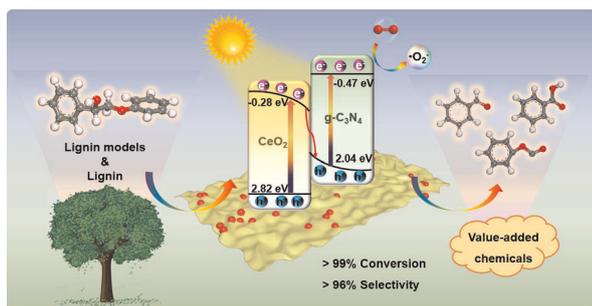
8921



Two-step hybrid photo-thermochemical looping process, using metallic clusters on metal oxide carriers, for very efficient green hydrogen production

Anh Dung Nguyen, David Buceta, Qingqing Wu,
Moteb Alotaibi, Julian T. Müller, Iria R. Arias, Albert Gili,
Maged F. Bekheet, Martin Dieste, Nerea Davila-Ferreira,
Fatimah Alhawiti, Colin Lambert,* M. Arturo López-
Quintela* and Reinhard Schomäcker*

8936



Selective and efficient cleavage of C_α-C_β bonds in lignin models and native lignin using an S-scheme CeO₂/g-C₃N₄ heterojunction photocatalyst

Yin Ai, Yuzhen Zhao, Xiaoqin Huang, Xutang Liu,*
Siqi Kuang, Haichang Ding, Yuling Zeng, Hongliang Liu*
and Gang Liu*

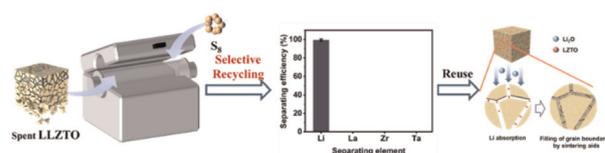


PAPERS

8950

Closed-loop recycling of spent $\text{Li}_{6.5}\text{La}_3\text{Zr}_{1.5}\text{Ta}_{0.5}\text{O}_{12}$: from selective lithium recovery to high-efficiency sintering-aid preparation

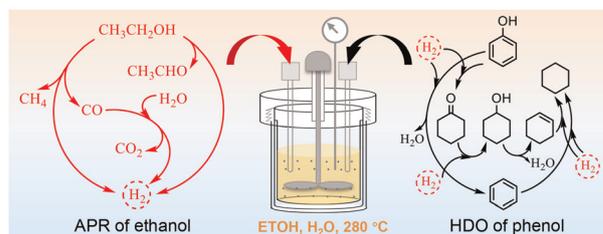
Yufan Zheng, Kexin Wan, Yuancheng Chen, Chuang Ji, Hongxiang Kuai and Xunhui Xiong*



8959

Selective C–O bond cleavage enhances aromatics production from lignin-derived platform molecules with ethanol as a hydrogen donor

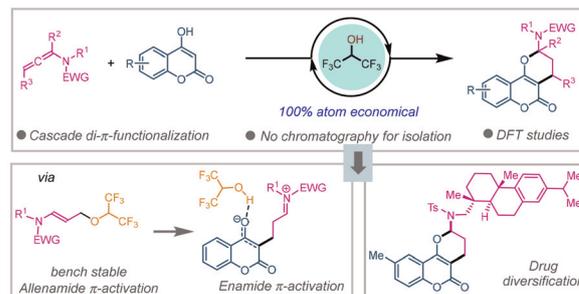
Hao Zhang, Qisong Yi, Huawei Geng, Zhifeng Liu, Wenhao Luo, Zichun Wang* and Yuanshuai Liu*



8972

Unlocking enhanced reactivity of hexafluoroisopropanol: a sustainable atom economical approach to selective cascade di- π -functionalization of allenamides

Yafia Kousin Mirza, Partha Sarathi Bera, R. Nandini, Dhrubajyoti Talukdar, Sachin Balaso Mohite, Manoj V. Mane* and Milan Bera*



8980

Light empowered aziridination of olefins under metal- and photocatalyst-free conditions

Bin Sun, Qian Zhang, Jianjie Wang, Yan Xu, Jiayin Wang, Chun Lv, Xiaohui Zhuang, Caiyun Yu and Can Jin*

