

Green Chemistry

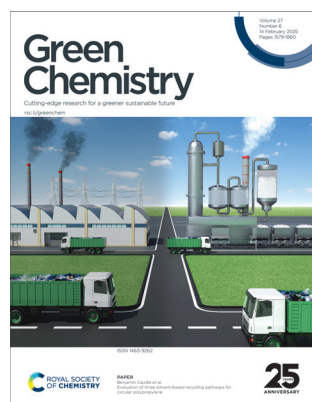
Cutting-edge research for a greener sustainable future

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IN THIS ISSUE

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See Benjamin Caudle *et al.*, pp. 1667–1678.

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Inside cover
See Rocío Villa, Pedro Lozano *et al.*, pp. 1620–1651.

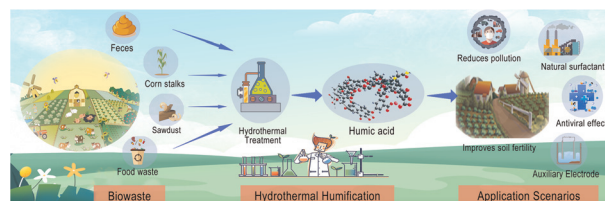
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CRITICAL REVIEWS

1588

Rapid humification of biomass *via* hydrothermal conversion: a comprehensive review

Yangjiuzhou Wang, Changbin Yuan, Kai Zhang, Jinyu Tong, Ningjie Ma, Mahmoud M. Ali, Yongdong Xu* and Zhidan Liu*



1604

Advances in bio-based wearable flexible sensors

Ziwen Zhang, Baofang Feng, Jipeng Yan, Weidong Zhao* and Jian Sun*



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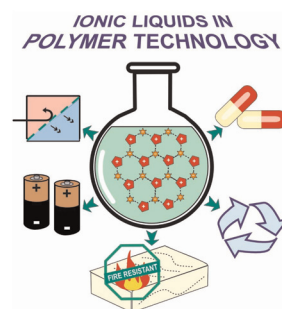
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TUTORIAL REVIEW

1620

Ionic liquids in polymer technology

Rebeca Salas, Rocio Villa,* Francisco Velasco, Francisco G. Cirujano, Susana Nieto, Nuria Martin, Eduardo Garcia-Verdugo, Jairton Dupont and Pedro Lozano*

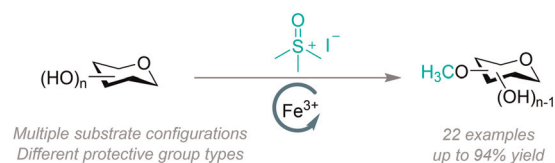


COMMUNICATIONS

1652

Trimethylsulfoxonium iodide: a green methylating agent for site-selective methylation of carbohydrates

Xiaorui Zhang, Jie Zhao, Qichang Yang, Zhangxuan Chen, Haifeng Wang, Shuang-Xi Gu and Jian Lv*



- Green and user-friendlier reagents
- Efficient catalysis
- Broad substrate scope
- Applicable for synthesis

1658

Electrochemical lactamization with CO₂

Ranran Zhang, Min Liu, Zhiwei Zhao and Youai Qiu*

Electrochemical lactamization with CO₂

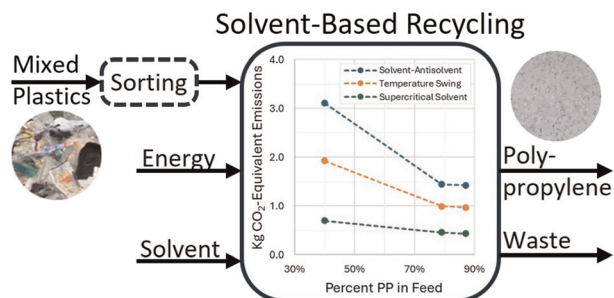
- Using CO₂ as a carbonyl source
- Transition Metal- and base-free process
- Broad substrates range and excellent functional group tolerance
- One pot synthesis

PAPERS

1667

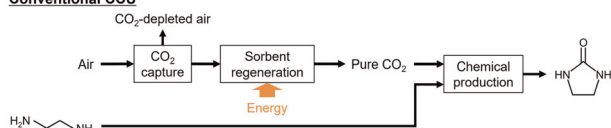
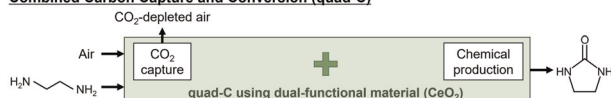
Evaluation of three solvent-based recycling pathways for circular polypropylene

Benjamin Caudle,* Thuy T. H. Nguyen and Sho Kataoka



PAPERS

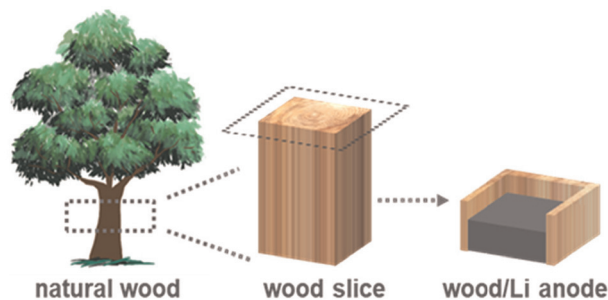
1679

Conventional CCU**Combined Carbon Capture and Conversion (quad-C)**

Energy and cost-saving potential of combined carbon capture and conversion: a pioneering design of a process intensification concept harnessing CeO₂ as a dual-functional material

Koki Yagihara, Jialing Ni, Anqing Wang, Hajime Ohno and Yasuhiro Fukushima*

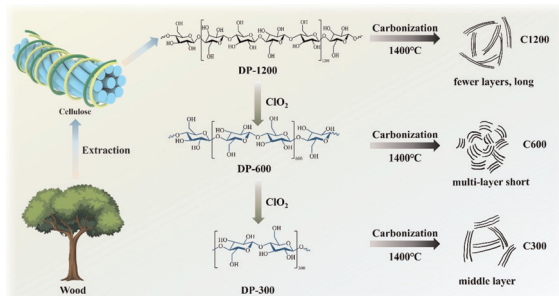
1696



Natural wood as a lithium metal host

Wei-Jing Chen,* Shang-Jie Yu, Qian Sun, Xin Shen, Peng Shi, Tong-Qi Yuan* and Zhaoqing Lu*

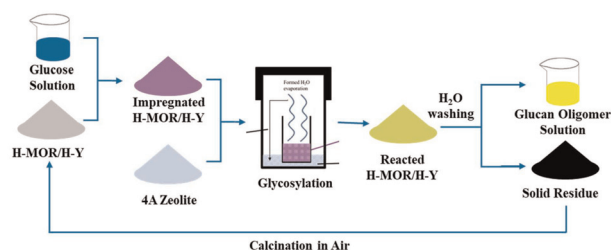
1703



Facile fabrication of cellulose-derived hard carbon for high-rate performance sodium-ion batteries by regulating degrees of polymerization

Fengyi Luo, Conghua Yi,* Dongjie Yang,* Dezhe Fan, Weifeng Liu, Xueqing Qiu and Wenli Zhang

1714



Confined synthesis of glucan oligomers from glucose in zeolites

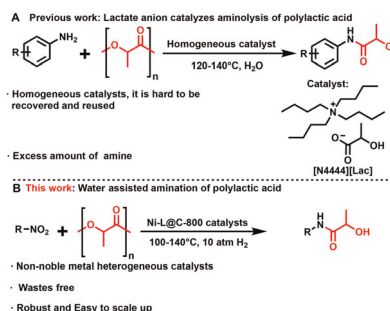
Haotong Liang, Sheng Ye, Qiyu Liu,* Wei Fan and Qiaozhi Ma*



1723

Reductive amidation of polylactic acid with nitro compounds using nickel based nanocatalysts

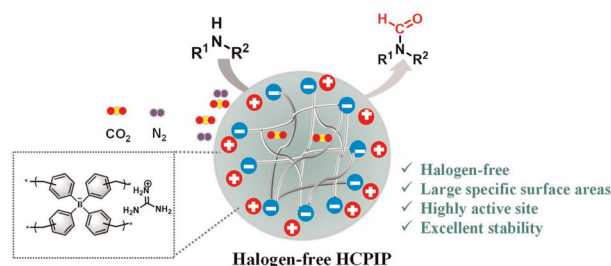
Jie Gao,* Lan Zhang, Long Luo* and Ning Wang*



1729

Design of halogen-free hyper-crosslinked porous ionic polymers for efficient CO₂ capture and conversion

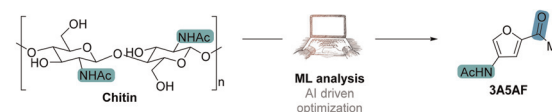
Xiaoqing Yang, Jinshan Zhao, Junfeng Zeng, Bihua Chen, Liang Tang, Jun Zhang, Akif Zeb, Zhiyong Li, Shiguo Zhang and Yan Zhang*



1740

Active learning assists chemical intuition identify a scalable conversion of chitin to 3-acetamido-5-acetylfuran

Juliana G. Pereira, João M. J. M. Ravasco, Latimah Bustillo, Inês S. Marques, Po-Yu Kao, Po-Yi Li, Yen-Chu Lin, Tiago Rodrigues,* Vasco D. B. Bonifácio, Andreia F. Peixoto, Carlos A. M. Afonso* and Rafael F. A. Gomes*

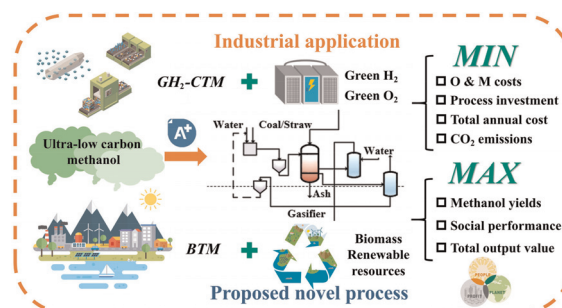


- important N-containing synthon obtained from waste biomass • commercial ionic liquid solvent can be reused
- interesting scaffold for further chemical exploitation • up to 72 % yield from NAG or 10 mg/g of shrimp shell

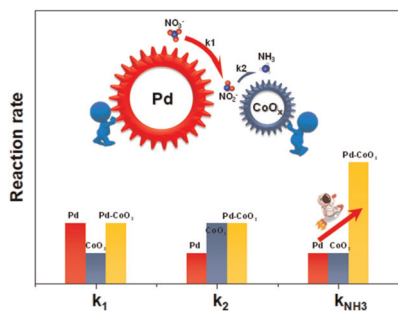
1747

Industrial ultra-low-carbon methanol synthesis routes: techno-economic analysis, life cycle environment assessment and multi-dimensional sustainability evaluation

Dongrui Zhang, Ruqiang Wang, Zhibo Zhang, Hao Yan, Xin Zhou,* Hui Zhao* and Chaohe Yang



1763

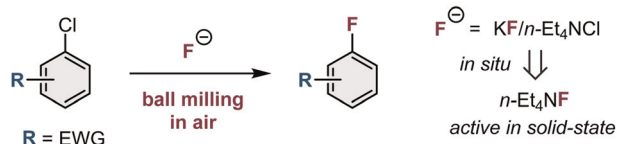


Electrochemically co-deposited Pd-CoO_x coating for efficient synergistic electrocatalytic reduction of nitrate to ammonia

Yan Wang, Yujia Zeng, Jiawei Xie, Chao Wang, Changan Zhou, Lei Song, Kui Ma and Hairong Yue*

1771

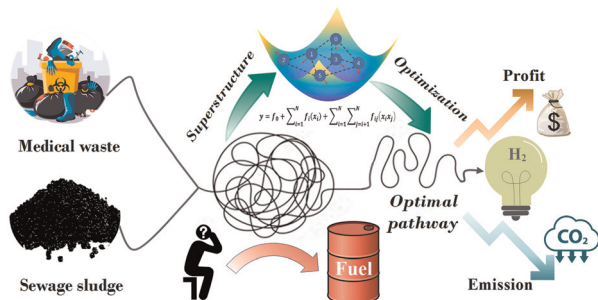
Solid-state S_NAr fluorination using mechanochemistry



Solid-state aromatic nucleophilic fluorination: a rapid, practical, and environmentally friendly route to N-heteroaryl fluorides

Koji Kubota,* Tetsu Makino, Keisuke Kondo, Tamae Seo, Mingoo Jin and Hajime Ito*

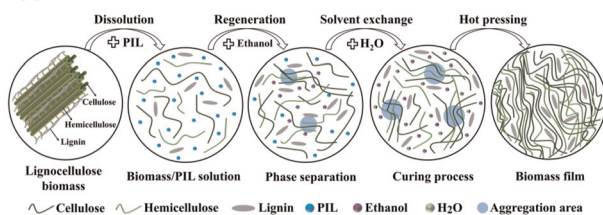
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Turning sewage sludge and medical waste into energy: sustainable process synthesis via surrogate-based superstructure optimization

Jianzhao Zhou, Jingzheng Ren* and Chang He

1789



Direct dissolution of lignocellulosic biomass by malonic acid-DBU protonic ionic liquid and preparation of high-performance all-biomass films

Long Zhang, Boxiang Zhan, Shangzhong Zhang, Haiyuan Ji, Shen Peng, Minghui Fan and Lifeng Yan*

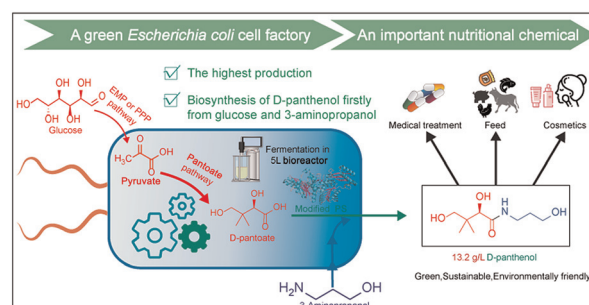


PAPERS

1806

Metabolic engineering of *Escherichia coli* for the production of D-panthenol from 3-aminopropanol and glucose

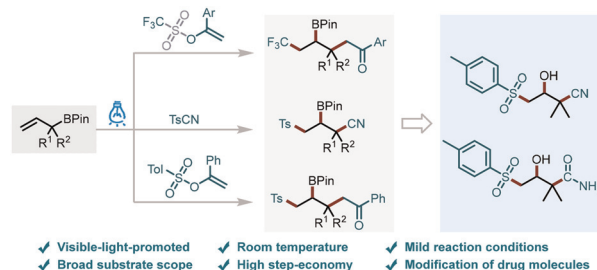
Junping Zhou, Zheng Zhang, Xinyuan Xin, Yinan Xue, Yihong Wang, Xueyun Feng, Bo Zhang, Man Zhao, Zhiqiang Liu* and Yuguo Zheng



1820

Visible-light-induced 1,3-difunctionalization of allylboronic esters enabled by a 1,2-boron shift

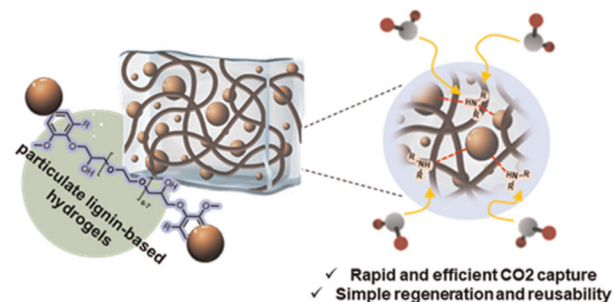
Panjie Xiang, Kai Sun,* Anzai Shi, Jiangzhen An, Xiaolan Chen, Lingbo Qu and Bing Yu*



1828

Monolithic, hybrid and particulate lignin-based hydrogels for sustainable CO₂ capture

Adrian Moreno,* Javier Delgado-Lijarcio, Juan C. Ronda, Marina Galià and Gerard Lligadas*



1838

Microwave-assisted ethanol dehydration to ethylene over biochar-based catalyst at low temperature

Li Yang, Bonan Liu,* Yingying Zhao, Zijian Zhang, Hanyu Wu, Minyi He, Chao Tang, Jun Zhao,* Yu Fan and Wangjing Ma*

