

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 28(9) 3901-4304 (2026)



Cover

See Lindsay D. Eltis, Lars Lauterbach *et al.*, pp. 4006–4018.

Image reproduced by permission of Lutz Kupferschläger from *Green Chem.*, 2026, **28**, 4006.

Cover artwork designed by Lutz Kupferschläger.



Inside cover

See Ive Hermans, Nelson Cardona-Martinez *et al.*, pp. 4019–4028.

Image reproduced by permission of Fillipp Edvard Laudiano Salvador from *Green Chem.*, 2026, **28**, 4019.

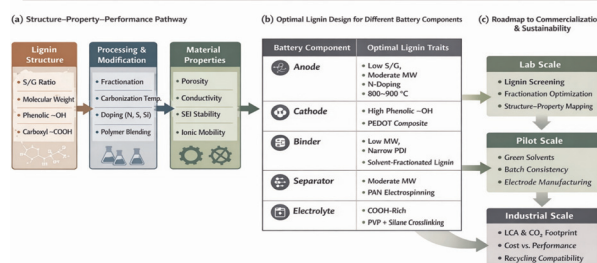
CRITICAL REVIEWS

3911

Lignin-enabled Li-ion battery components: recent advances and outlook

Enoch Abeeku Aidoo and Pedram Fatehi*

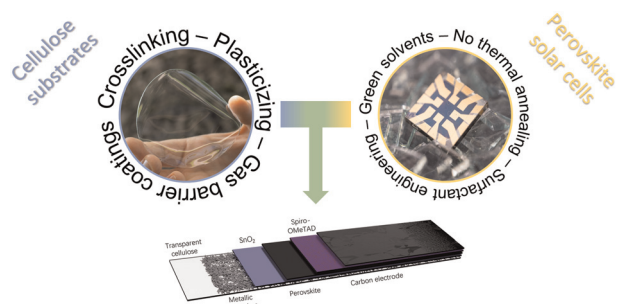
Structure–Processing–Performance Relationships and Design Roadmap for Lignin-Based Lithium-Ion Battery Components



3936

Combining cellulose substrates and perovskites in sustainable solar cells is possible: a systematic literature review offering realistic solutions

Joaquín Valdez García,* Mahboubeh Hadadian, Vidushi Aggarwal, Sirius Yli-Paavola, Joice Kaschuk, Riikka Suhonen, Marja Välimäki and Kati Miettunen*



**GOLD
OPEN
ACCESS**

EES Solar

**Exceptional research on solar
energy and photovoltaics**

Part of the EES family

**Join
in**

Publish with us

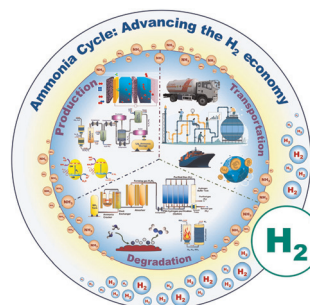
rsc.li/EESolar

TUTORIAL REVIEW

3963

Techno-economic insights into ammonia as a hydrogen vector: synthesis, cracking, storage, and supply chain solutions

Mousumi Biswas, Shankab J. Phukan, Suraj Goswami, Jit Satra, Gaurav Gupta, Tarun Yadav, Ranjith Krishna Pai,* Manas Roy* and Somenath Garai*

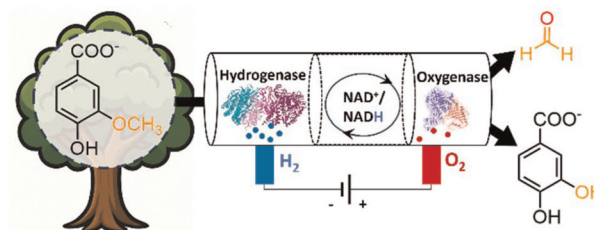


PAPERS

4006

H₂-driven biocatalytic O-demethylation of lignin derived aromatics in a closed-loop flow system powered by water electrolysis

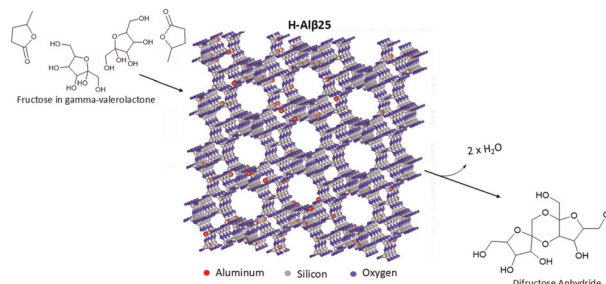
Donato Calabrese, Guiyeoul Lim, Parsa Nayyara, Megan E. Wolf, Paul R. F. Cordero, Lindsay D. Eltis* and Lars Lauterbach*



4019

The catalytic conversion of fructose to difructose anhydride

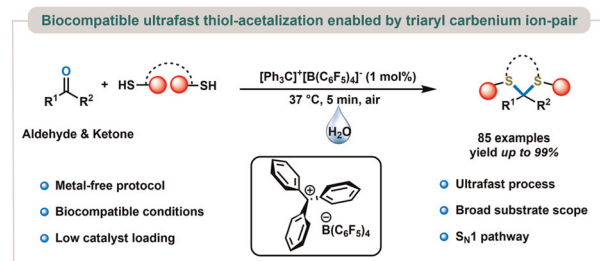
Isabel Hortal-Sánchez, Faysal Ibrahim, Edgard A. Lebrón-Rodríguez, Fabiola Y. Rodríguez-Rodríguez, Grace Gooley, Ruining Ma, Matias Alvear, Ive Hermans* and Nelson Cardona-Martinez*



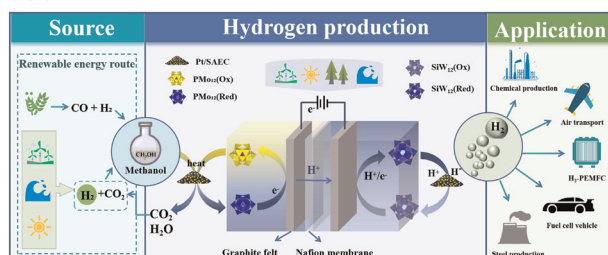
4029

Biocompatible ultrafast thiol-acetalization enabled by triaryl carbenium ion-pair

Peng Chen,* Ming Zou, Yu Zhang, Niuniu Li, Ruoqi Li, Lijuan Liang, Zhenguo Zhang, Teck-Peng Loh* and Zhenhua Jia*



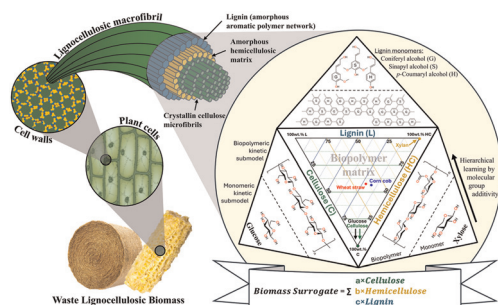
4036



Rational design of a $\text{PMo}_{12}\text{-SiW}_{12}$ coupled catalytic system toward energy-efficient methanol-to-hydrogen conversion

Xinyue He, Weizhuo Xu, Guohao Xu, Wei Wang, Xin Bi, Bingjie Zhou, Jianfei Song and Wei Liu*

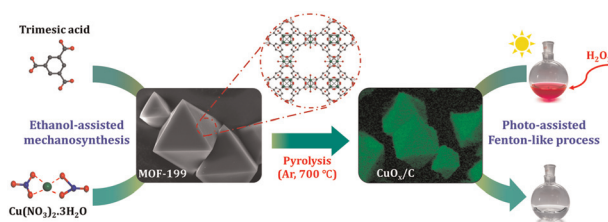
4048



Butyl levulinate production from lignocellulose with mechanistic learning by hierarchical surrogate kinetic modelling

Conall McNamara,* Ailís O'Shea, Tiarnán Watson-Murphy, Leandro Ayarde-Henríquez, Thiago De Melo Lima and Stephen Dooley

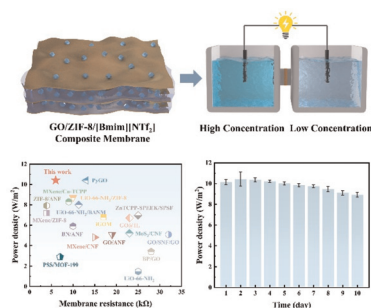
4075



Ethanol-assisted mechanochemical synthesis of MOF-199-derived CuO_x /carbon composites with tunable copper species for photo-enhanced Fenton-like dye degradation

Khoa D. Tran, Hoan T. Phan, Khoa A. Nguyen, Khoa A. N. Van, Ha V. Le, Huy X. Le, Phuoc H. Ho, Ha P. K. Huynh and Khoa D. Nguyen*

4092



A hydrophobic ionic liquid and ZIF-8 co-modified graphene oxide membrane for efficient osmotic energy conversion

Yizhuo Wang, Changchao Yan, Jingyun Guo, Zhizhen Ye, Xinyi Wan* and Xincheng Peng*

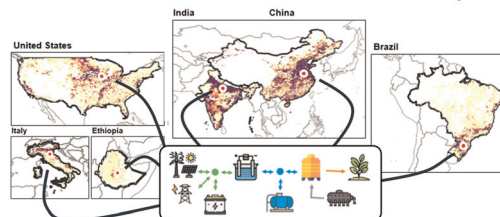


4103

Optimal design of decentralized ammonia production via electric Haber–Bosch systems

Lorenzo Rosa* and Davide Tonelli

Electric Haber-Bosch for ammonia production

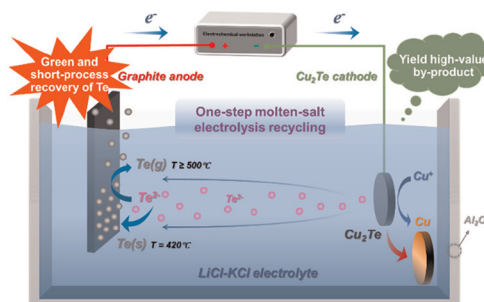


Techno-economic and optimization analysis

4119

Chloride molten salt-mediated one-step electrochemical recycling of tellurium from copper(I) telluride

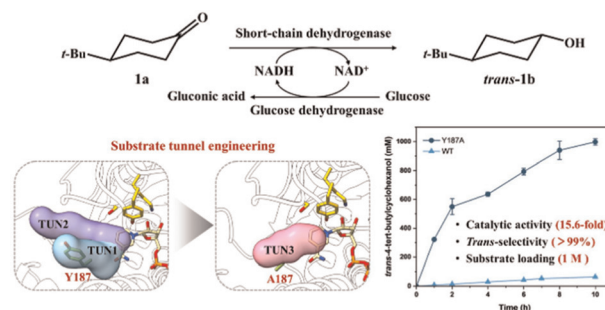
Libo Chen, Jiguo Tu,* Meng Zhang, Mingyin Kou and Shuqiang Jiao*



4130

Substrate tunnel redesign of short-chain dehydrogenase enabled efficient biocatalytic production of the TRPV1 antagonist *trans*-4-*tert*-butylcyclohexanol

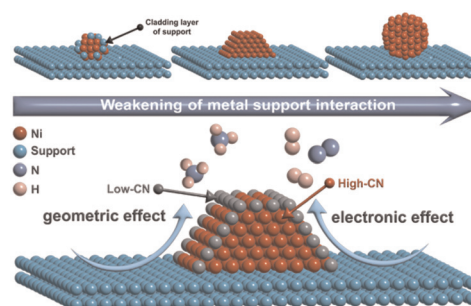
Ting Wang, Lidan Ye* and Hongwei Yu*



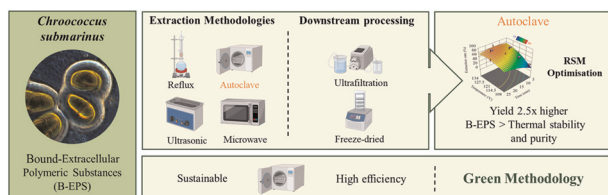
4143

Pyramidal Ni nanoparticles with highly coordinated surfaces enabled by metal–support interaction regulation for efficient H₂ production from NH₃

Zheng Li, Jun-Jun Yao, Jia-Ning Song, Jun-Kang Guo,* Dong Zhang, Hui-Juan Wang, Ji-Zhou Yang and Shuang-Feng Yin*



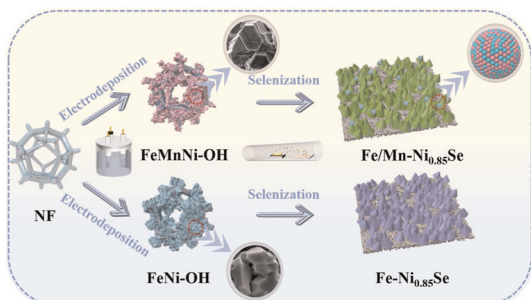
4152



Towards scalable production of bound extracellular polymeric substances (B-EPS): autoclave hydrothermal extraction coupled with solvent-free ultrafiltration

Ivana Mendonça, Filipa Rodrigues, Marisa Faria,*
Juan L. Gómez Pinchetti, Artur Ferreira and
Nereida Cordeiro*

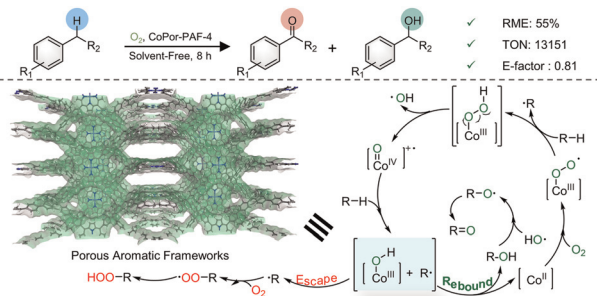
4164



Accelerated HER kinetics *via* electron-deficient Ni and electron-enriched Se sites by dual Fe and Mn doping for highly efficient hydrogen production

Guanglin Zhu, Lili Ren, Bo Gao, Cean Guo,* Jianjia Mu,*
Fang Gu* and Zhongbao Feng*

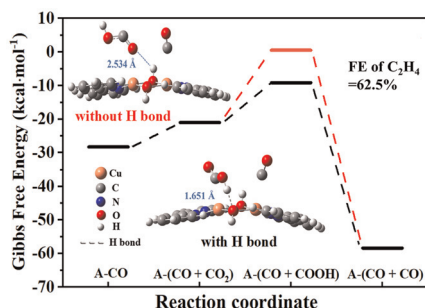
4173



Solvent-free aerobic oxidation of benzylic C–H bonds *via* nanoconfined cobalt–porphyrin frameworks: a green and safe catalytic strategy

Hong-liang Ye,* Kai-jing Zhang* and Yuan-bin She*

4188



Hydrogen bond interactions on a dual-core copper catalyst promote the activation of low-concentration CO₂ and the generation of ethylene

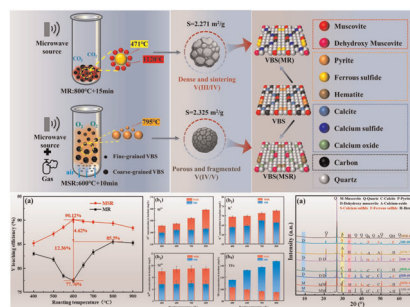
Guodong Sun,* Yingfei Ma, Yanan Cao, Kaiyang Zhao,
Kewen Ao, Xinqi Wang, Mingtian Hao, Mengchen Sun
and Wei Zhang*



4196

Microwave suspension roasting for efficient vanadium extraction from fine-grained shale: a dual mechanism of sintering suppression and oxidation enhancement

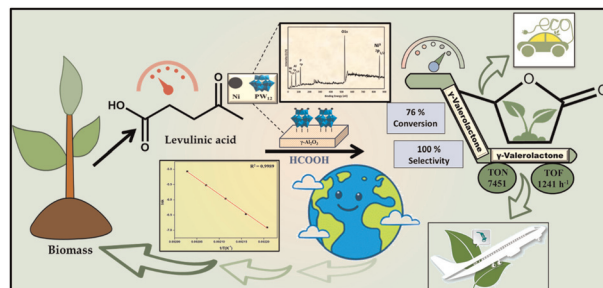
Yonglong Chen, Yizhong Yuan,* Pengcheng Hu,*
Yimin Zhang, Sheng Li and Yu Ye



4213

Synthesis of next-generation biofuel additive, γ -valerolactone, via hydrogenation of levulinic acid in the presence of formic acid over nickel-exchanged 12-tungstophosphoric acid supported on neutral Al₂O₃ and its kinetics study

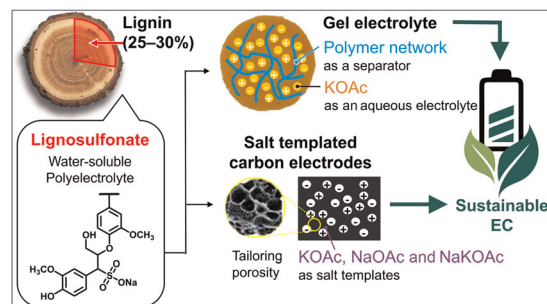
Kavan Chauhan and Anjali Patel*



4225

Lignin as a precursor of a gel electrolyte and salt templated carbon for sustainable electrochemical capacitors

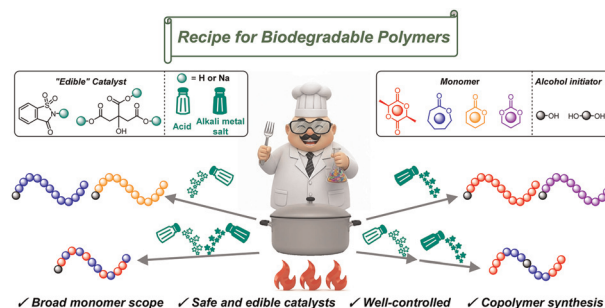
Amelia Klimek, Lina Amro, Nutthira Pakkang,
Camélia Matei Ghimbeu, Elzbieta Frackowiak* and
Shiori Suzuki*



4243

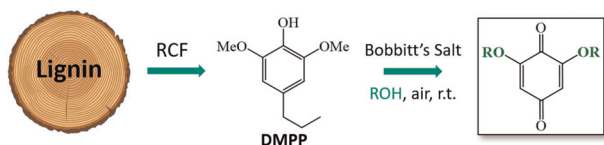
Well-controlled synthesis of biodegradable polyesters using edible catalysts

Toshiki Miwa, Ryota Suzuki, Tianle Gao,
Takuya Yamamoto, Feng Li,* Takuya Isono and
Toshifumi Satoh*



PAPERS

4255

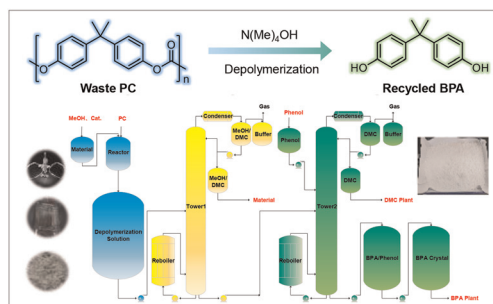


- ✓ Excellent yield and selectivity
- ✓ Tunable substitution
- ✓ Easy separation
- ✓ Air-mediated oxidation
- ✓ Ambient temperature
- ✓ Metal-free

Selective conversion of lignin to benzoquinones under ambient conditions: unlocking the potential of a single platform chemical strategy

Xinquan Li, Anthony J. Chavez, Hao Zhang, Daria Andryushkina, Peter C. Ford and Mahdi M. Abu-Omar*

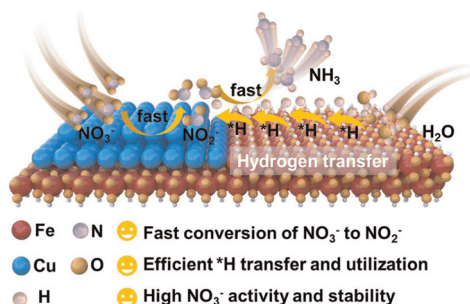
4263



Quaternary ammonium hydroxide-catalyzed methanolysis of bisphenol-A polycarbonate: performance, mechanism, and scale-up

Lu Zhang, Li Song, Haipeng Dong, Jing-Bang Kang, Honglu Zhu, YunJin Zhong, Hengcong Tao, Yao-Yao Zhang* and Xianming Zhang*

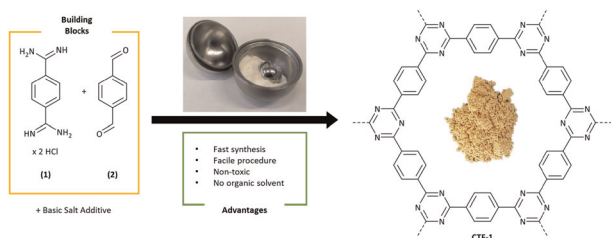
4277



Modulation of hydrogen transfer behaviors over Fe/Cu interfacial sites for a boosted electrocatalytic nitrate reduction reaction

Hongxia Luo, Lin Gu, Ziyang Wu, Jun Chen and Jianping Yang*

4292



Accessing photocatalytically active covalent triazine-based frameworks by ball milling: a fast and facile synthesis method

Leonie Sophie Häser, Sven Moos, Felix Egger, Keanu Birkelbach, Mirijam Zobel, Thomas Wiegand and Regina Palkovits*

