

# Green Chemistry

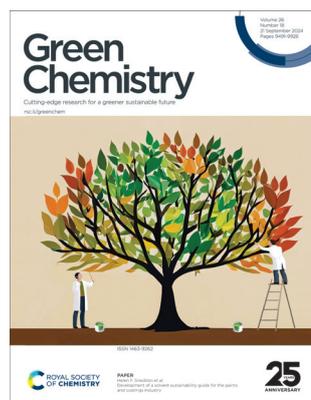
Cutting-edge research for a greener sustainable future

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## IN THIS ISSUE

ISSN 1463-9262 CODEN GRCHFJ 26(18) 9491-9926 (2024)



**Cover**  
See Helen F. Sneddon *et al.*,  
pp. 9697–9711.

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9697.



**Inside cover**  
See Volker Hessel,  
Marc Escrivà-Gelonch *et al.*,  
pp. 9503–9528.

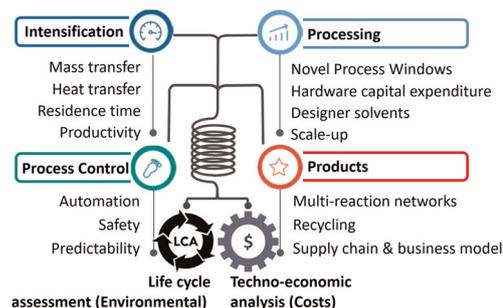
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*Green Chem.*, 2024, **26**,  
9503.

## CRITICAL REVIEWS

9503

### Sustainability of flow chemistry and microreaction technology

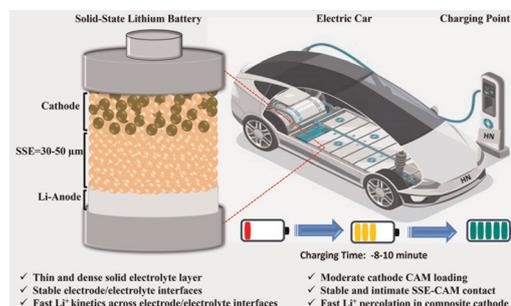
Volker Hessel,\* Sampurna Mukherjee, Sutanuka Mitra, Arunava Goswami, Nam Nghiep Tran, Francesco Ferlin, Luigi Vaccaro, Fariba Malekpour Galogahi, Nam-Trung Nguyen and Marc Escrivà-Gelonch\*



9529

### Key challenges and advancements toward fast-charging all-solid-state lithium batteries

Niaz Ahmad, Cailing Fan, Muhammad Faheem, Xiaoxiao Liang, Yirong Xiao, Xinting Cao, Chaoyuan Zeng,\* Qinxin Dong and Wen Yang\*



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# EES Batteries

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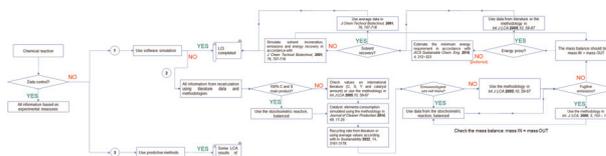
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## CRITICAL REVIEWS

9554

## Procedural life cycle inventory of chemical products at laboratory and pilot scale: a compendium

Daniele Cespi

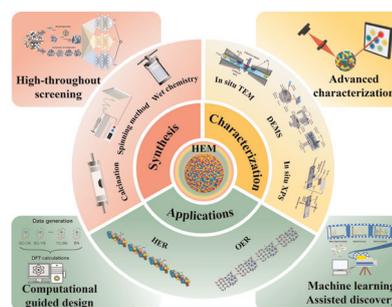


## TUTORIAL REVIEWS

9569

## High entropy materials: potential catalysts for electrochemical water splitting

Zhong Wang, Xinjia Tan, Ziyu Ye, Shiyu Chen, Guojian Li, Qiang Wang\* and Shuang Yuan\*

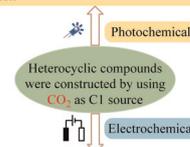


9599

## Advances in photochemical/electrochemical synthesis of heterocyclic compounds from carbon dioxide

Yu-Yang Xie and Ying-Ming Pan\*

1. The single electron transfer (SET) processes
2. Cooperative/dual photocatalysis
3. Visible light-induced transition metal catalyzed transformations
4. Photoexcitation

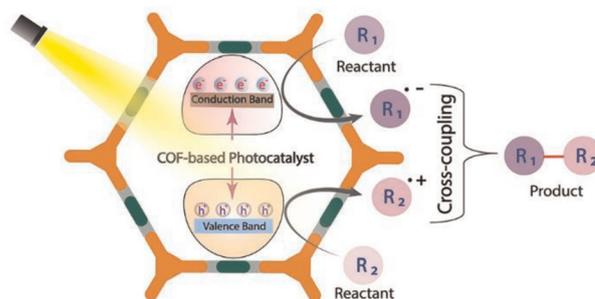


1. Direct electrolysis
2. Transition metal-mediated electrochemical cyclization
3. Halogen-mediated electrochemical cyclization
4. Organic molecule-mediated electrochemical cyclization
5. EGB-mediated electrochemical cyclization

9619

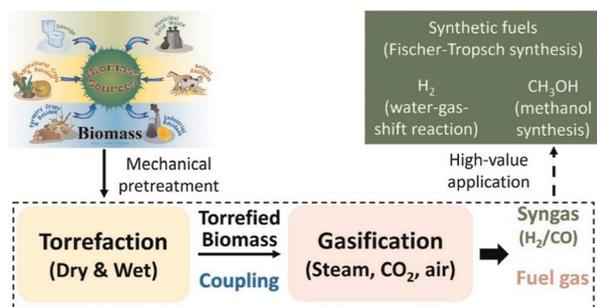
## Covalent organic frameworks as heterogeneous photocatalysts for cross-coupling reactions

Avanti Chakraborty, Monojit Roy, Akhtar Alam,\* Debashis Adhikari\* and Pradip Pachfule\*



## TUTORIAL REVIEWS

9652

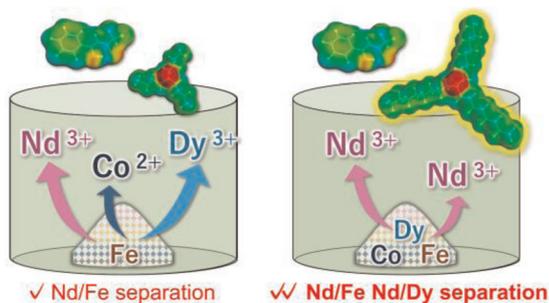


### Progress in torrefaction pretreatment for biomass gasification

Quanhui Zhou, Yafei Shen\* and Xuehong Gu

## COMMUNICATIONS

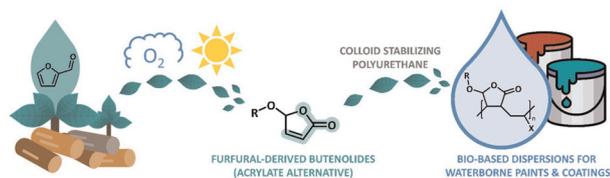
9671



### Improved separation of rare earth elements using hydrophobic deep eutectic solvents: liquid–liquid extraction to selective dissolution

Takafumi Hanada,\* Nicolas Schaeffer, Masahiro Katoh, Joao A. P. Coutinho and Masahiro Goto\*

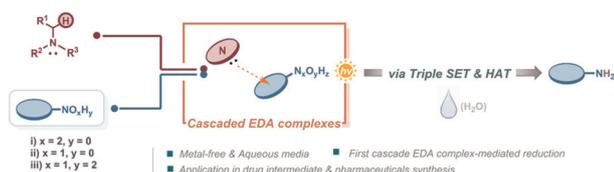
9676



### Waterborne polymers and coatings from bio-based butenolides

Andries Jensma, Niels Elders,\* Keimpe J. van den Berg and Ben L. Feringa\*

9682



### Light-fuelled nitro-reduction via cascaded electron donor–acceptor complexes in aqueous media

Xiaohui Zhuang, Haijing Song, Jiayin Wang, Zhaokang Zhang, Jiayang Wang, Bin Sun,\* Weike Su and Can Jin\*

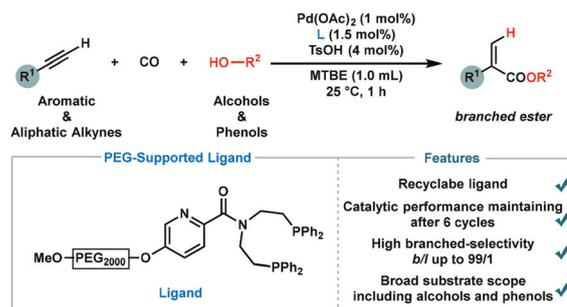


## COMMUNICATIONS

9690

### Recyclable picolinamide-derived ligand-controlled branched-selective hydroesterification of alkynes with alcohols and phenols

Ding Liu, Luyun Zhang, Jiaxin Cheng, Qiuxiang Wei, Zhenhua Jia\* and Fen-Er Chen\*

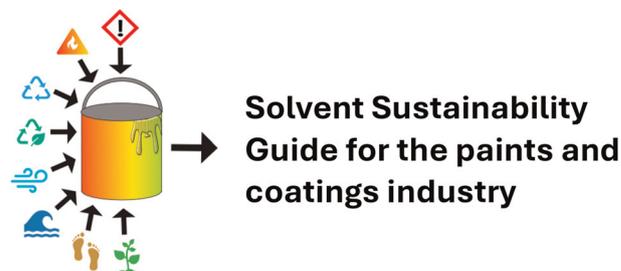


## PAPERS

9697

### Development of a solvent sustainability guide for the paints and coatings industry

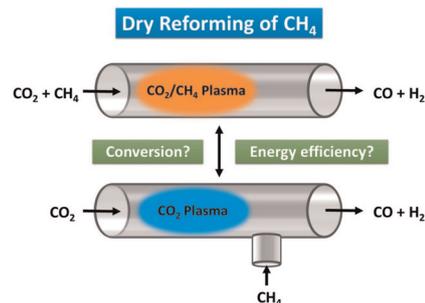
Laura Pilon, Daniel Day, Harry Maslen, Oliver P. J. Stevens, Nicola Carlsaw, David R. Shaw and Helen F. Sneddon\*



9712

### Can post-plasma CH<sub>4</sub> injection improve plasma-based dry reforming of methane? A modeling study

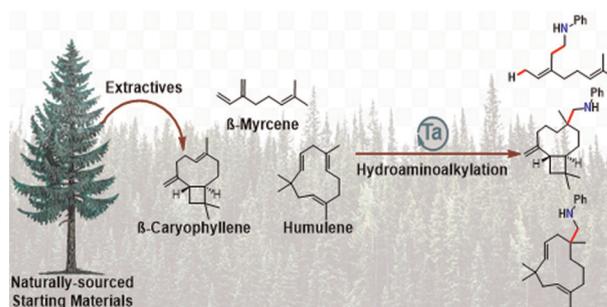
Matthias Albrechts,\* Ivan Tsonev and Annemie Bogaerts



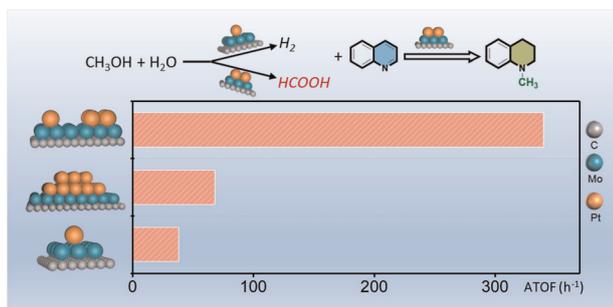
9729

### Exploiting natural complexity for substrate controlled regioselectivity and stereoselectivity in tantalum catalysed hydroaminoalkylation

Cameron H. M. Zheng, Ben E. Nadeau, Heather L. Trajano\* and Laurel L. Schafer\*



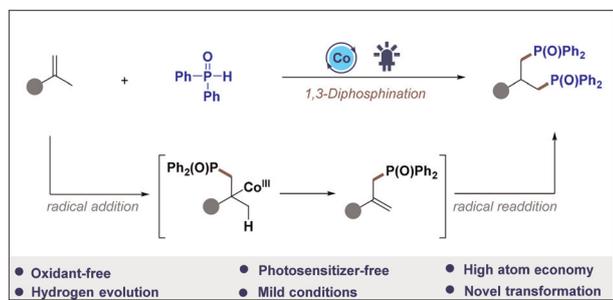
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### Additive-free *N*-methylation reaction synergistically catalyzed by Pt single atoms and clusters on $\alpha$ -MoC using methanol as a sustainable C1 source

Shurui Fan, Mingyuan Zhang, Xiangxin Jin, Zirui Gao, Yao Xu, Maolin Wang, Chuqiao Song, Houhong Song, Xiangxiang Chen, Rulong Ma, Siyu Yao, Rui Gao,\* Xiaonian Li\* and Lili Lin\*

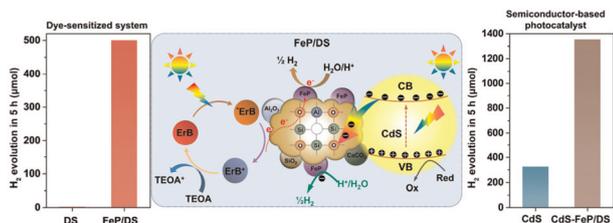
9749



### Visible light-induced cobalt-catalyzed 1,3-diphosphination of alkenes

Wenlong Shan, Zemin Wang, Chenxia Gao, Xiaowei Li, Wenli Zhuang, Ruihua Liu, Cong Shi, Hongyun Qin, Xiangqian Li and Dayong Shi\*

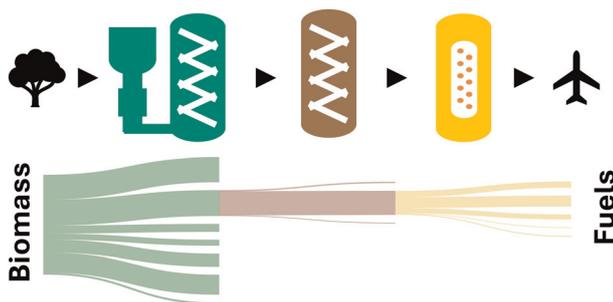
9757



### Triggering inert desert sand toward a low-cost and efficient cocatalyst for photocatalytic hydrogen evolution reactions

Junqing Wang, Fang Wang, Zhengguo Zhang and Shixiong Min\*

9768



### Opening pathways for the conversion of woody biomass into sustainable aviation fuel *via* catalytic fast pyrolysis and hydrotreating

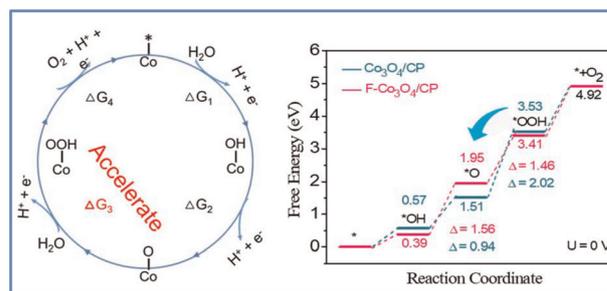
Michael B. Griffin,\* Kristiina Iisa, Abhijit Dutta, Xiaolin Chen, Cody J. Wrasman, Calvin Mukarakate, Matthew M. Yung, Mark R. Nimlos, Luke Tuxworth, Xavier Bauchere, Steven M. Rowland and Susan E. Habas



9782

### Trace F-doped $\text{Co}_3\text{O}_4$ nanoneedles for enhanced acidic water oxidation activity via promoting OH coverage

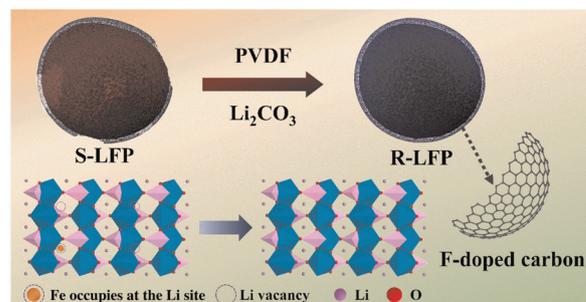
Genyan Hao, Tao Zhao, Qiang Fang, Yunzhen Jia, Dandan Li, Dazhong Zhong,\* Jinping Li and Qiang Zhao\*



9791

### Direct regeneration of fluorine-doped carbon-coated $\text{LiFePO}_4$ cathode materials from spent lithium-ion batteries

Yurong Han, Yin Zhuang Fang, Menglong Yan, Haoyu Qiu, Yifeng Han, Yi Chen, Liangyou Lin, Jingwen Qian, Tao Mei and Xianbao Wang\*



9802

### Directional glycolysis of waste PET using deep eutectic solvents for preparation of aromatic-based polyurethane elastomers

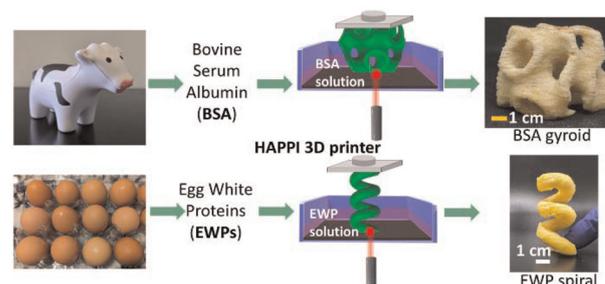
Fei Li, Xiaoqian Yao, Rong Ding, Yinan Bao, Qing Zhou,\* Dongxia Yan, Yi Li, Junli Xu, Jiayu Xin and Xingmei Lu\*



9814

### Additive manufacturing via protein denaturation

Chang-Uk Lee, Sung June Kim, Rachel B. Dietrich, Audrey L. Girard and Andrew J. Boydston\*



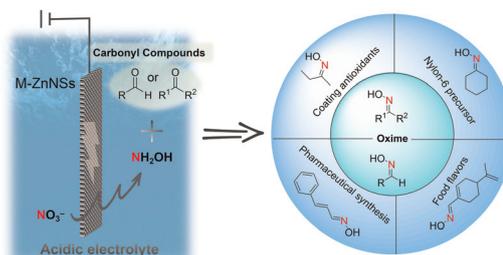


## PAPERS

9869

## Highly efficient electrosynthesis of oximes from nitrates and carbonyl compounds in acidic media

Cheng Xue, Shuaiqiang Jia,\* Jiapeng Jiao, Xiao Chen, Zhanghui Xia, Mengke Dong, Ting Deng, Hailian Cheng, Chunjun Chen, Haihong Wu,\* Mingyuan He and Buxing Han\*

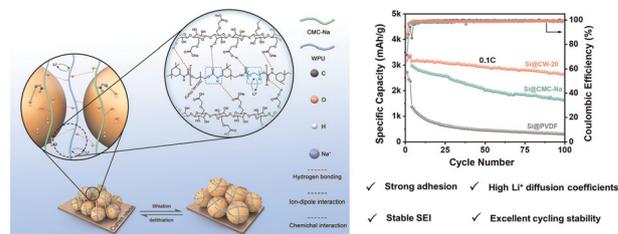


✓ High yield and selectivity ✓ Broad substrate compatibility ✓ Ultra-long stability

9874

## A water-soluble binder in high-performance silicon-based anodes for lithium-ion batteries based on sodium carboxymethyl cellulose and waterborne polyurethane

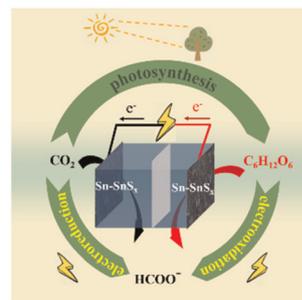
Xingshen Sun, Xiangyu Lin, Yong Wen, Fuhao Dong, Lizhen Guo, Zhanqian Song, Zitao Yang, He Liu, Xuequan Li,\* Xu Xu\* and Hongxiao Wang\*



9888

Construction of a self-supporting bifunctional Sn–SnS<sub>x</sub> electrocatalyst *via* one-step electrodeposition for formate production from coupled CO<sub>2</sub> reduction and glucose oxidation

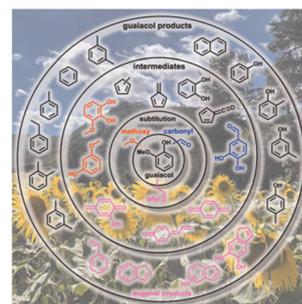
Chongyan Chen, Shuguang Shen,\* Jie Wang, Yongmei Liu, Xingting Guo, Lili Zhang and Jing Li



9899

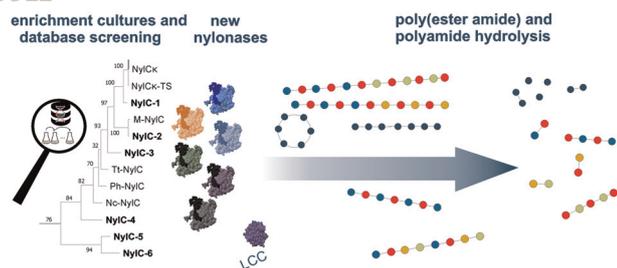
## Catalytic pyrolysis mechanism of lignin moieties driven by aldehyde, hydroxyl, methoxy, and allyl functionalization: the role of reactive quinone methide and ketene intermediates

Zeyou Pan, Xiangkun Wu, Andras Bodi, Jeroen A. van Bokhoven and Patrick Hemberger\*



## PAPERS

9911



### Increasing the diversity of nylonases for poly(ester amide) degradation

Jan de Witt, Maike-Elisa Ostheller, Kenneth Jensen, Christian A. M. R. van Slagmaat, Tino Polen, Gunnar Seide, Stephan Thies, Benedikt Wynands and Nick Wierckx\*

## CORRECTION

9923

### Correction: An eco-friendly one-pot extraction process for curcumin and its bioenhancer, piperine, from edible plants in exosome-like nanovesicles

Meghana N. Kumar, Sreeram Peringattu Kalarikkal, Cathrine M. S. Bethi, Sukriti Narendra Singh, Janakiraman Narayanan and Gopinath M. Sundaram\*

