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See Shengping You, Sheng Ye, Yaxin Wang, Wei Qi *et al.*, pp. 2560–2570.

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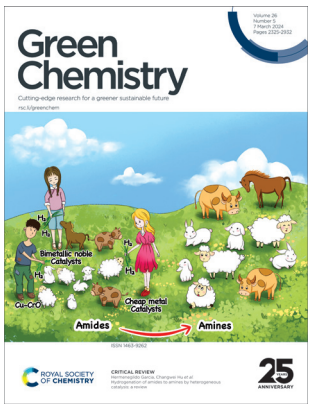

Inside cover
See Hermenegildo Garcia, Changwei Hu *et al.*, pp. 2341–2364.

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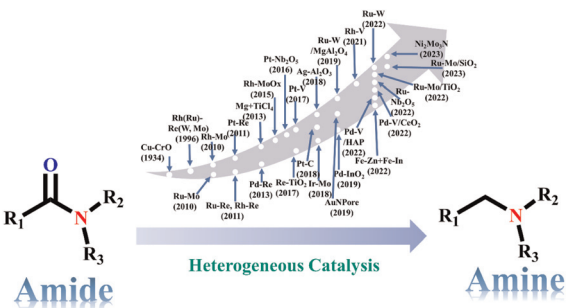
CRITICAL REVIEWS

2341

Hydrogenation of amides to amines by heterogeneous catalysis: a review

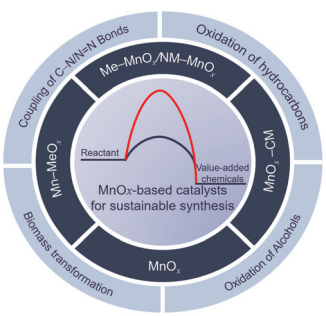
Huiru Yang, Hermenegildo Garcia* and Changwei Hu*



2365

Manganese oxide-based catalysts for the sustainable synthesis of value-added chemicals through oxidation processes: a critical review and perspectives for the future

Junpeng Wang, Yurong Zhang, Xu Guo, Jun Tang, Zhipeng Chen, Minh Ngoc Ha,* Ping Cui and Qingping Ke*



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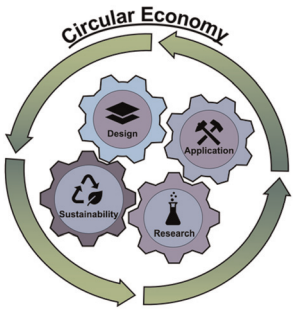
CRITICAL REVIEWS

2384

Design of depolymerizable polymers toward a circular economy

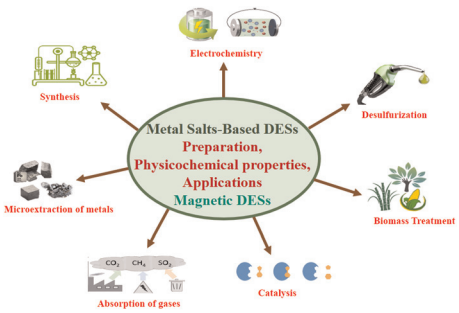
Julian F. Highmoore, Lasith S. Kariyawasam, Scott R. Trenor and Ying Yang*



2421

Breaking new grounds: metal salts based-deep eutectic solvents and their applications- a comprehensive review

Aman Khalid, Suman Tahir, Abdul Rafay Khalid, Muhammad Asif Hanif, Qamar Abbas and Muhammad Zahid*

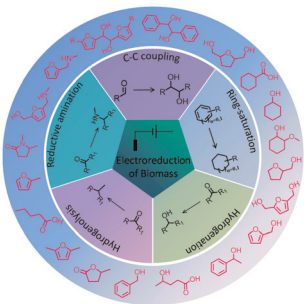


TUTORIAL REVIEWS

2454

Electroreductive upgradation of biomass into high-value chemicals and energy-intensive biofuels

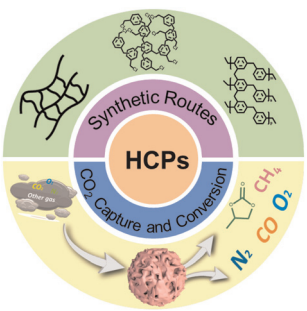
Keping Wang, Zheng Li, Zhenyan Guo, Jinshu Huang, Tengyu Liu, Min Zhou, Jinguang Hu* and Hu Li*



2476

Green synthesis of hypercrosslinked polymers for CO_2 capture and conversion: recent advances, opportunities, and challenges

Wenliang Song, Yunxin Tang, Byeong Yeol Moon, Qian Liao, Hailang Xu, Qing Hou, Heng Zhang, Deng-Guang Yu,* Yaozu Liao* and Il Kim*



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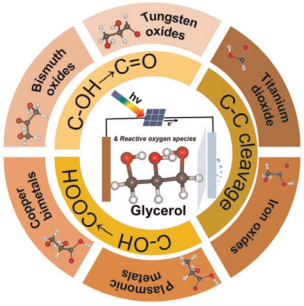
TUTORIAL REVIEWS

2505



Recent advances in the selective oxidation of glycerol to value-added chemicals *via* photocatalysis/photoelectrocatalysis

Yang Liu, Bing Zhang, Dongpeng Yan* and Xu Xiang*

PERSPECTIVE

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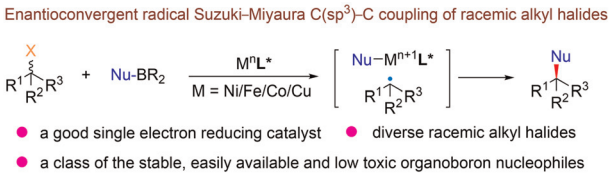

The first-row transition metal-catalysed enantioconvergent radical Suzuki–Miyaura C(sp^3)–C coupling of racemic alkyl halides

Lin Liu,* Chang-Jiang Yang, Zhong-Liang Li, Qiang-Shuai Gu and Xin-Yuan Liu*

COMMUNICATIONS

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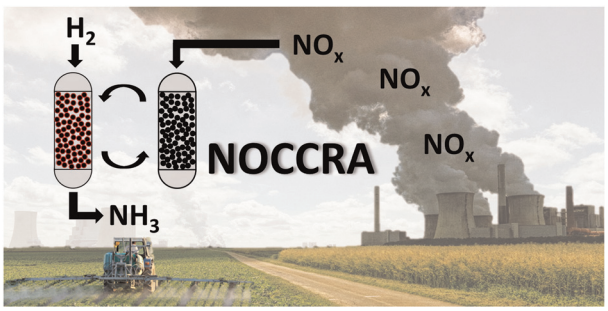
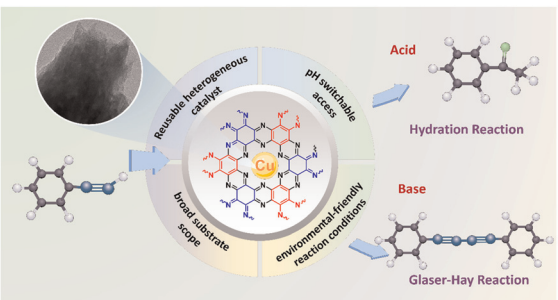


Green ammonia synthesis from stationary NO_x emission sources on a catalytic lean NO_x trap

Frea Van Steenweghen, Lander Hollevoet and Johan A. Martens*

2540



A recyclable Cu@C_2N nano-catalyst applied in the transformation of alkynes: pH switchable access to ketones and 1,3-diynes

Yuanjin Li, Tianyu Yang, Shuhui Wang, Zuqiang Bian* and Zhiwei Liu*

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COMMUNICATIONS

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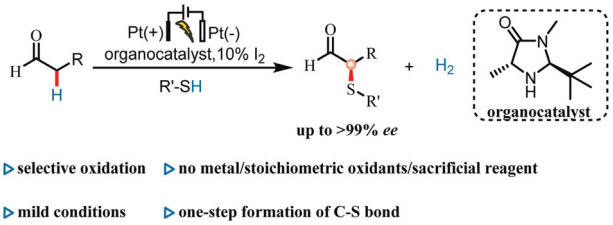
Iodine-enabled organoelectrocatalysis: enantioselective cross dehydrogenative coupling of sulfides and aldehydes

Zhen Wang, Marcel Gausmann, Jan-Hendrik Dickoff and Mathias Christmann*



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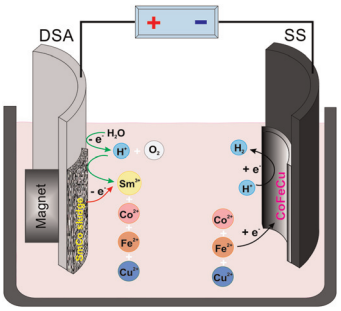
A cleaner strategy for efficient recovery of Sm_2O_3 and CoFeCu alloy from SmCo swarf based on an anodic leaching process

Xuan Xu,* Jun Gao, Kunyuan Zhao, Haifeng Sun, Peng Jing, Baocang Liu* and Jun Zhang*



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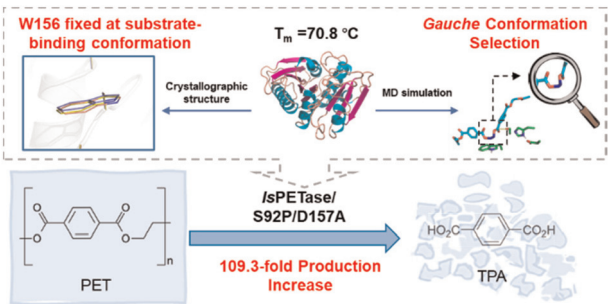
Efficient polyethylene terephthalate biodegradation by an engineered *Ideonella sakaiensis* PETase with a fixed substrate-binding W156 residue

Qingdian Yin, Jiaxing Zhang, Sen Ma, Tao Gu, Mengfan Wang, Shengping You,* Sheng Ye,* Rongxin Su, Yaxin Wang* and Wei Qi*



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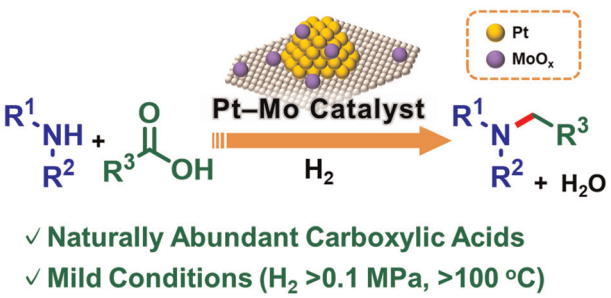
Reductive amination of carboxylic acids under H_2 using a heterogeneous Pt–Mo catalyst

Katsumasa Sakoda, Sho Yamaguchi, Kazuki Honjo, Yasutaka Kitagawa, Takato Mitsudome and Tomoo Mizugaki*



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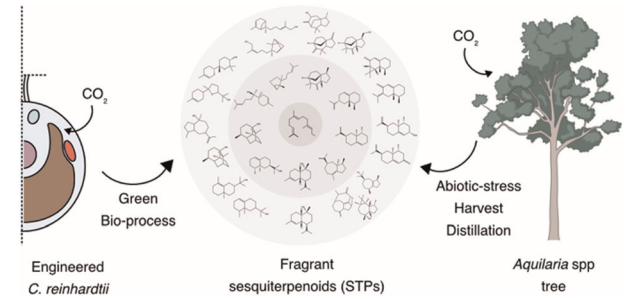

A synthetic biology and green bioprocess approach to recreate agarwood sesquiterpenoid mixtures

Sergio Gutiérrez, Sebastian Overmans, Gordon B. Wellman, Vasilios G. Samaras, Claudia Oviedo, Martin Gede, Gyorgy Szekely and Kyle J. Lauersen*

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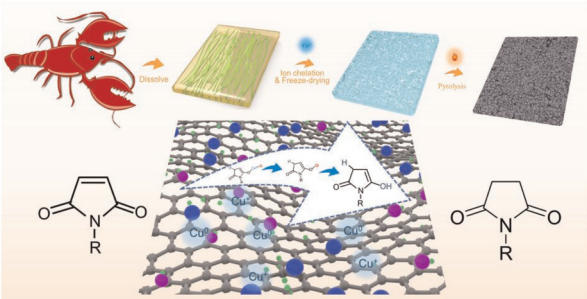

Preparation of reusable copper-based biomass-carbon aerogel catalysts and their application in highly selective reduction of maleimides to succinimides with hydrosilane as a hydrogen source

Shaohuan Lv, Zhanhong Yuan, Juanjuan Zheng, Zirong Liu, Jiawang Ye, Jiefang Li, Shanshan Xu, Feng Xie, Dongdong Ye* and Bin Li*

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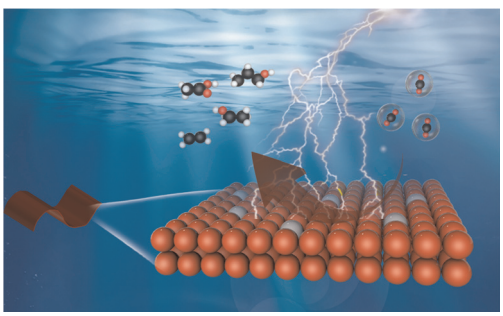
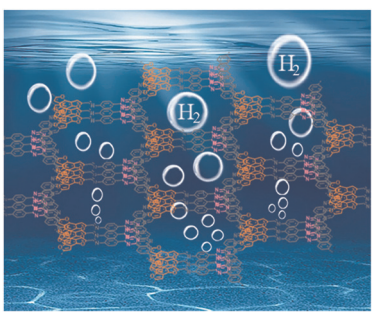


Stabilization of Cu^+ sites by amorphous Al_2O_3 to enhance electrochemical CO_2 reduction to C_{2+} products

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

2605



Benzotrifuran-based donor–acceptor covalent organic frameworks for enhanced photocatalytic hydrogen generation

Chuanmeng Yang, Zhenwei Zhang, Jiali Li, Yuxin Hou, Qi Zhang,* Zhongping Li, Huijuan Yue and Xiaoming Liu*

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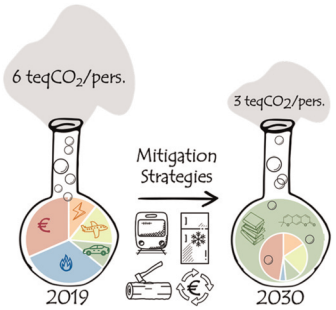
Carbon footprint and mitigation strategies of three chemistry laboratories

André Estevez-Torres,* Fabienne Gauffre, Guillaume Gouget, Chloé Grazon and Philippe Loubet*



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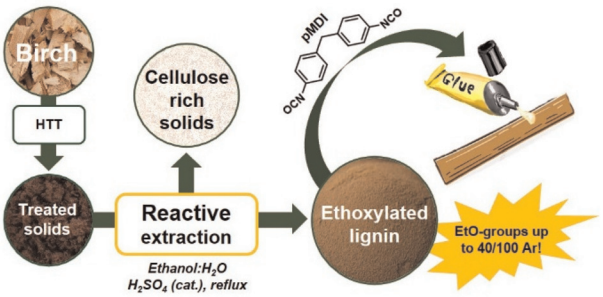
Upgrading AquaSolv Omni (AqSO) biorefinery: access to highly ethoxylated lignins in high yields through reactive extraction (REx)

Davide Rigo,* Nadine Kohlhuber, Lukas Fliri, Daryna Diment, Mijung Cho, Ivan Sumerskii, Michael Hummel, Antje Potthast and Mikhail Balakshin



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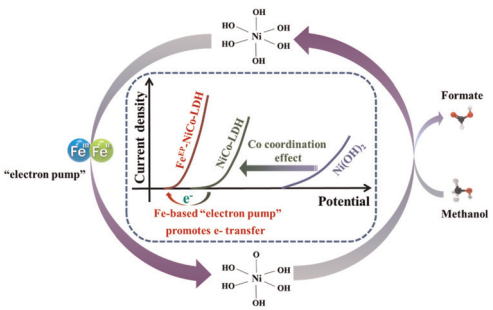
Fe-based "electron pump" involving NiCo-LDH enables robust and highly-selective electrocatalytic methanol oxidation to formic acid

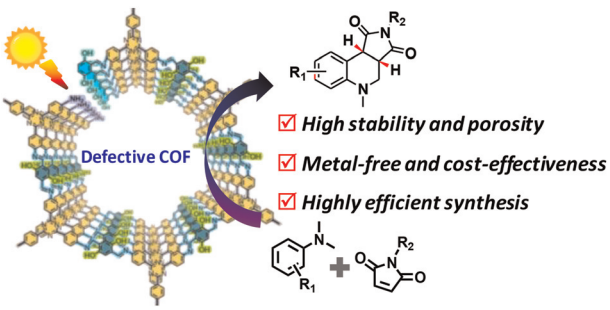
Jiawei Shi, Huawei He, Shunfa Zhou, Jing Li and Weiwei Cai*



2645

Missing-linker defects in a covalent organic framework photocatalyst for highly efficient synthesis of tetrahydroquinoline

Yuling Zhao,* Kangna Zhang, Keping Zhu, Yaqin Zhao, Hanping Zhai and Jikuan Qiu*



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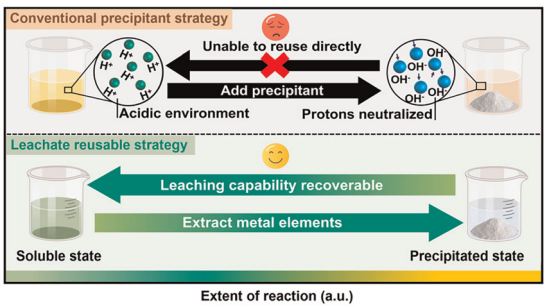
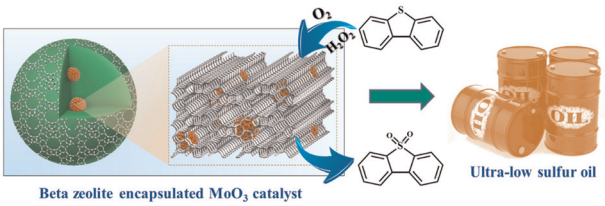


Realizing the reusability of leachate for the hydrometallurgical recycling of spent lithium cobalt oxide by dynamically regulating the solubility product

Tao Hu, Taibai Li, Xuncheng Liu, Zhongjie Wang, Liang Lou, Siqi Jing, Xiaohui Yan, Yige Xiong, Junkai Xiong and Xiang Ge*

2661



***In situ* encapsulation of ultrasmall MoO_3 nanoparticles into beta zeolite for oxidative desulfurization**

Songcheng Bo, Haoyi Lin, Jiaxing Zhang, Weiping Liao, Kaixuan Yang, Ting Su, Hongying Lü* and Zhiguo Zhu*

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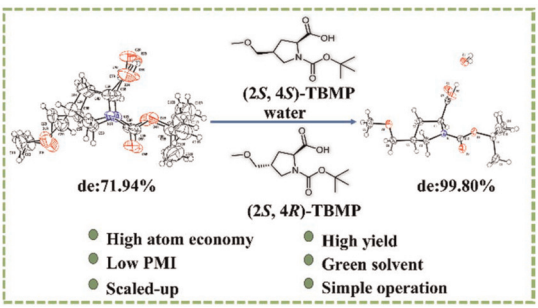
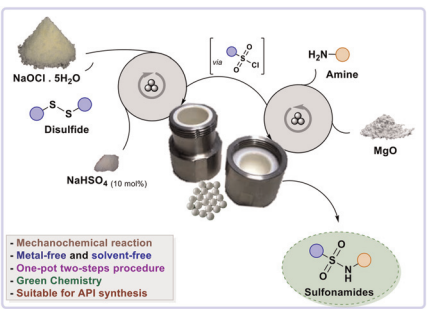


Design and process study of chiral separation of (2*S*,4*S*)-1-(*tert*-butoxy carbonyl)-4-(methoxymethyl) pyrrolidine-2-carboxylic acid for green manufacturing

Shuwang Ge, Mingwei Fu, Dihai Gu, Lai Wei, Kun Qian, Qi Rui, Yan Ma, Liang Li, Huaiqiu Wang, Lingchao Li, Min Ge and Yihong Wang*

2684



Mechanosynthesis of sulfonamides *via* a telescopic, environmentally friendly, and cost-effective process

Federico Cuccu and Andrea Porcheddu*

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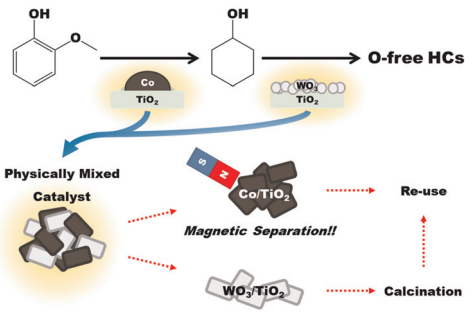
Hydrodeoxygenation of guaiacol over physically mixed Co/TiO_2 and WO_3/TiO_2 catalysts

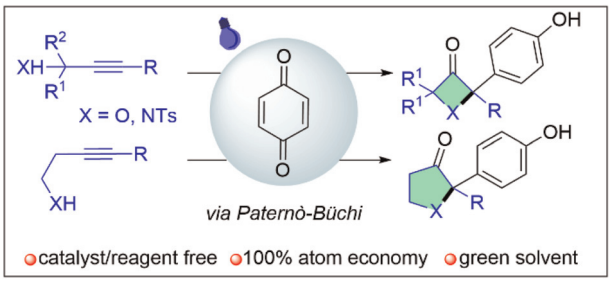
Hyungjoo Kim, Yong Hyun Lim, Jae Hyun Park, Jeong-Myeong Ha and Do Heui Kim*



2705

Photoinduced arylative formal 4-*endo-dig* cyclization of propargyl alcohols/amines to access strained heterocycles

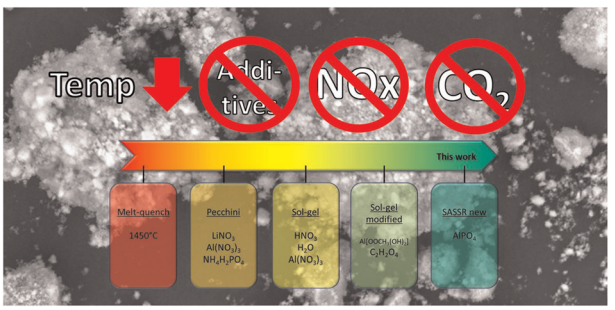
Pammi Venka Reddy, Attunuri Nagireddy, Jagadeesh Babu Nanubolu and Maddi Sridhar Reddy*



2712

Reducing the environmental footprint of solid-electrolytes - a green synthesis route for LATP

Melanie Rosen, Philipp Hecker, Markus Mann, Qianli Ma, Jürgen Peter Gross, Ruth Schwaiger, Olivier Guillon, Dina Fattakhova-Rohlfing and Martin Finsterbusch*



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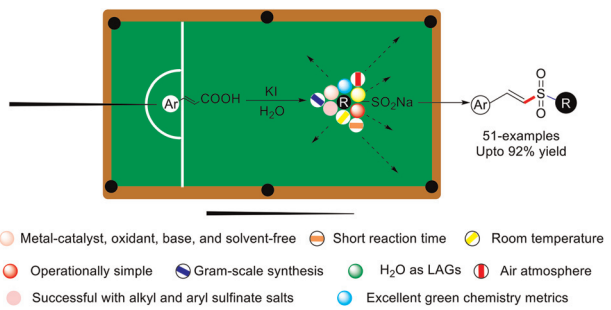
Mechanochemical-assisted decarboxylative sulfonylation of α,β-unsaturated carboxylic acids with sodium sulfinate salts

Barakha Saxena, Roshan I. Patel, Shruti Sharma and Anuj Sharma*



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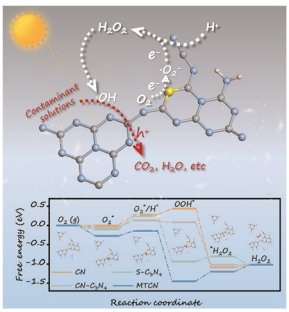

Green and alcohol-free H_2O_2 generation paired with simultaneous contaminant treatment enabled by sulfur/cyano-modified g-C_3N_4 with efficient oxygen activation and proton adsorption

Zijie Wang, Jiaqi Wu, Xiaoqiong Fan, Yiwen Zhang, Qing Xu, Bocheng Qiu, Liang Chen,* Xiaofei Zeng* and Qiaohong Zhu*

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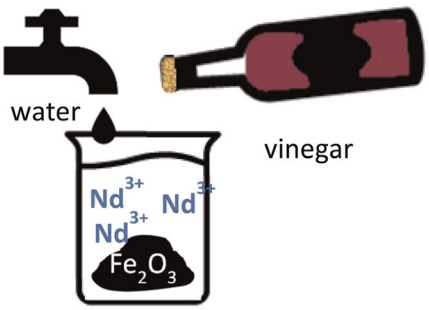

Selective neodymium recovery from model permanent magnets using cost-effective organic acid systems

Cristina Pozo-Gonzalo,* Rabeeh Golmohammadzadeh, Munkhshur Myekhlai, Henrique Bastos, Glen B. Deacon and Anthony E. Somers

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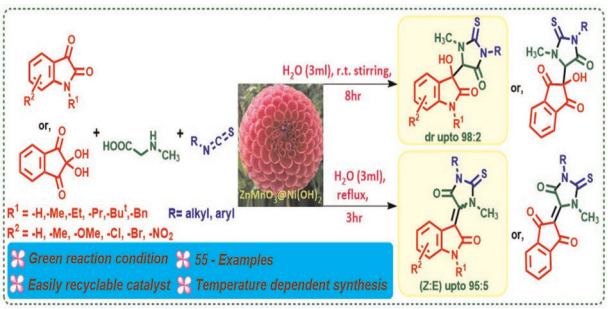
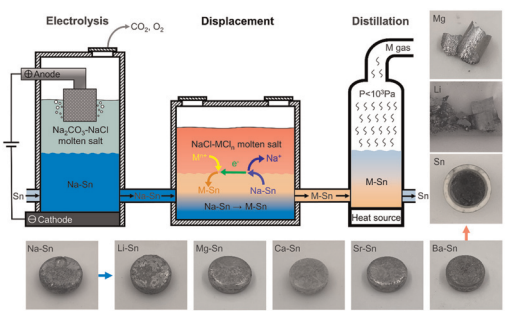


"On-water" synthesis of thioxoimidazolidinone-isatin/ninhydrin conjugates, followed by temperature-induced dehydration by a $ZnMnO_3$@$Ni(OH)_2$ nano-catalyst

Soumitra Rana, Soumyadip Basu, Aswini Bera, Pinaki Saha, Prasanta Ghosh, Bhanu Bhusan Khatua and Chhanda Mukhopadhyay*

2763



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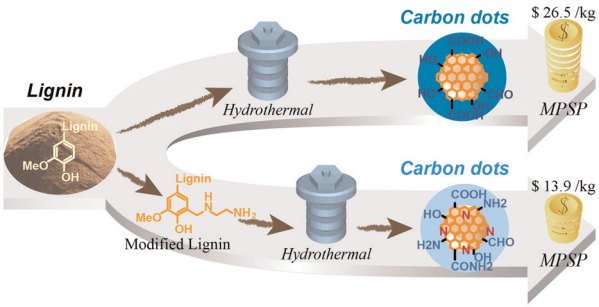
PAPERS

2773

Improving the revenue of lignin conversion into carbon dots by prior amino modification

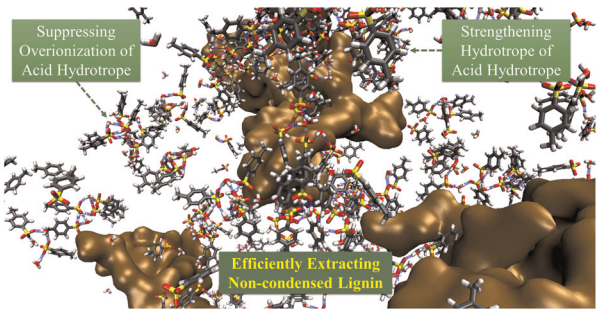
Tingting Chu, Xiaoxu Yang, Mingjie Chen,* Qing-Shan Shi,* Xiaobao Xie* and Yanzhu Guo*



2783

Unraveling lignin extraction: molecular dynamics insights into effective biomass valorization using a *p*-toluenesulfonic acid/solvents system

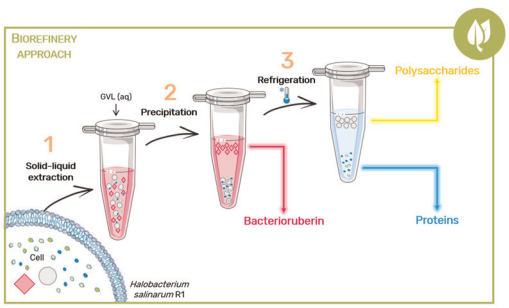
Jiayi Zheng, Liheng Chen,* Zhichang Huang and Xueqing Qiu*



2793

Bio-based solvents as a sustainable alternative to develop a multiproduct biorefinery process from archaebacteria *Halobacterium salinarum* R1

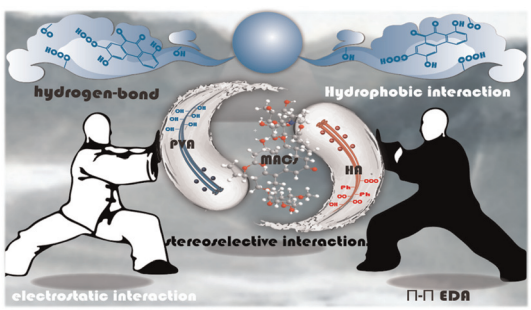
Mariam Kholany, Inês P. E. Macário, Telma Veloso, Letícia S. Contieri, Bárbara M. C. Vaz, Joana L. Pereira, Cláudia Nunes, João A. P. Coutinho, Maurício A. Rostagno,* Sónia P. M. Ventura* and Leonardo M. de Souza Mesquita*



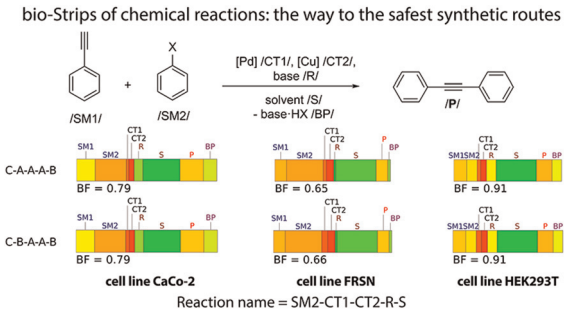
2807

Design of a novel green bio-based organic–inorganic hybrid material for cost-effective and sustainable monitoring of antibiotic residues

Guowen Qin, Huilin Song, Dan Wu, Yuqi Zhang, Peiqi Li, Kaidi Zhang, Yang Zheng* and Shunli Ji*



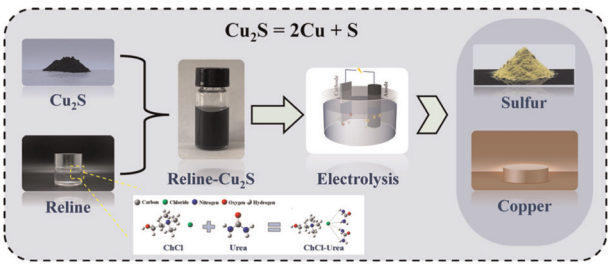
2825



Establishing the main determinants of the environmental safety of catalytic fine chemical synthesis with catalytic cross-coupling reactions

Ksenia S. Egorova,* Andrey E. Kolesnikov, Alexandra V. Posvyatenko, Alexey S. Galushko, Ruslan R. Shaydullin and Valentine P. Ananikov*

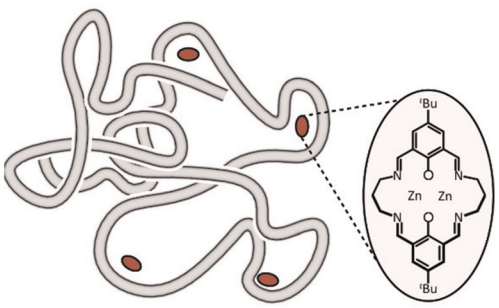
2842



One-step separation and recovery of copper and sulfur by electrolysis in deep eutectic solvents

Jihua Li, Yucheng Xu, Jinfeng Zhou, Weijia Chen, Shiwei He,* Zhongsheng Hua and Hui Kong*

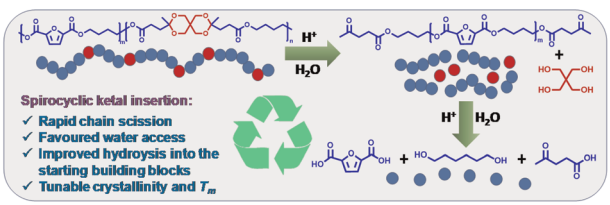
2851



Embedding an esterase mimic inside polyesters to realize rapid and complete degradation without compromising their utility

Yanfen Wu, Jing Tian, Minmin Sun, Lizeng Gao, Jun Xu* and Zhiqiang Niu*

2858



Improved chemical recyclability of 2,5-furandicarboxylate polyesters enabled by acid-sensitive spirocyclic ketal units

Nitin G. Valsange, Niklas Warlin, Smita V. Mankar, Nicola Rehnberg, Baozhong Zhang* and Patric Jannasch*

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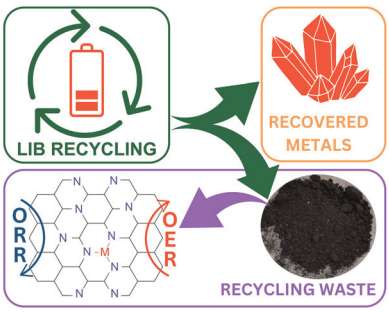
PAPERS

2874

Supporting critical raw material circularity – upcycling graphite from waste LIBs to Zn–air batteries

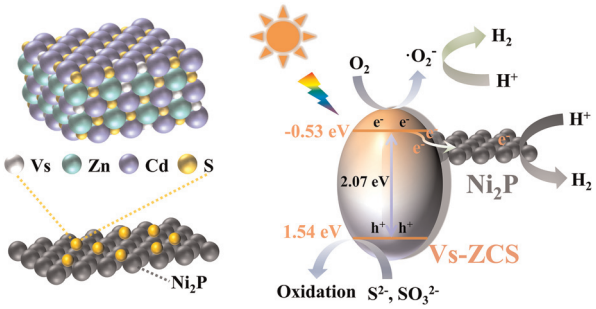
Reio Praats, Alexander Chernyaev, Jani Sainio, Mari Lundström, Ivar Kruusenberg and Kerli Liivand*



2884

Sulfur vacancies and a Ni_2P co-catalyst synergistically boost the photocatalytic H_2 evolution of $Zn_{0.5}Cd_{0.5}S$

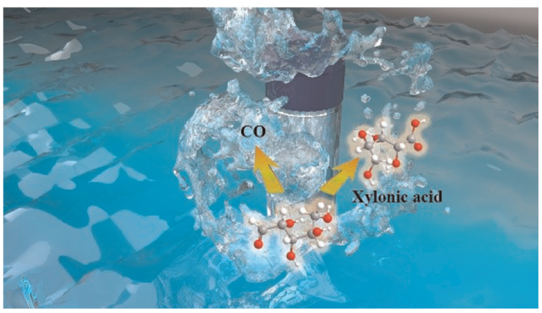
Lindong Xia, Wenzhen Qin, Yu Xie,* Yiqiao Wang and Yun Ling



2893

Efficient photocatalytic conversion of xylose to co-produce xylonic acid and CO *via* a dual S-scheme heterojunction photocatalyst between carbon nitride and $CuInS_2$ quantum dot-sensitized $ZnIn_2S_4$

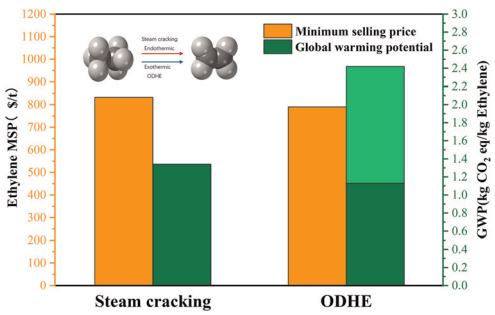
Kangning Liu, Junqiang Zhang, Jiliang Ma* and Runcang Sun*



2903

Ethylene production: process design, techno-economic and life-cycle assessments

Yuqiu Chen, Mi Jen Kuo, Raul Lobo and Marianthi Ierapetritou*



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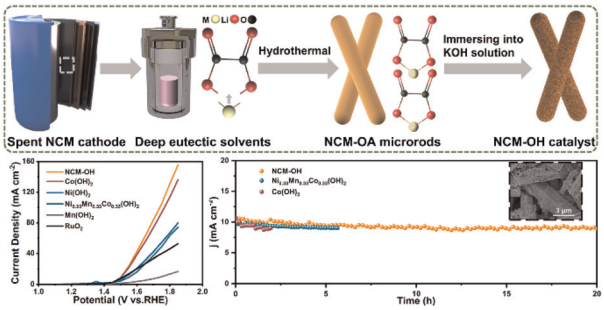
PAPERS

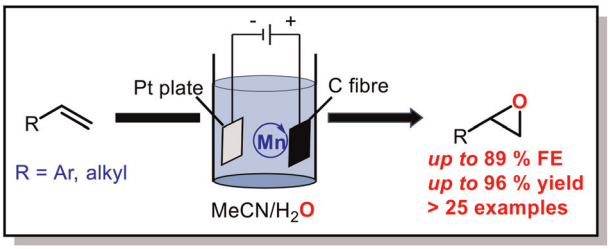
2912



Recycling spent $LiNi_{1-x-y}Co_xMn_yO_2$ cathodes to efficient catalysts for the oxygen evolution reaction

Mingfei Chen, Yixin Zhou, Li Wang, Gang Xue, Jiashuo Guo and Yaping Wang*

2922



Electrochemical epoxidation of alkene with high faradaic efficiencies using water as an oxygen source

Hao Wu, Yousen Xu, Pengyu Guo, Yuqing Xu, Zheng Huang* and Lei Zhang*

CORRECTIONS

2928

Correction: Spent tea leaves templated synthesis of highly active and durable cobalt-based trifunctional versatile electrocatalysts for hydrogen and oxygen evolution and oxygen reduction reactions

Md Ariful Ahsan,* Muhammad A. Imam, Alain R. Puente Santiago,* Alejandro Rodriguez, Bonifacio Alvarado-Tenorio, Ricardo Bernal, Rafael Luque and Juan C. Noveron*

2929

Correction: Photoelectrochemical NADH regeneration on a polymer semiconductor-based photocathode

Nanxin Li, Jia You, Lanlan Huang, Haoran Zhang, Xianlong Wang, Lihua He, Chunli Gong, Shiwei Lin* and Bingqing Zhang*

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