

Green Chemistry

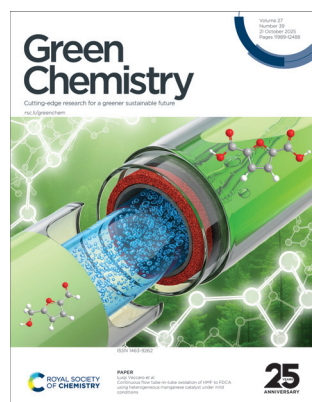
Cutting-edge research for a greener sustainable future

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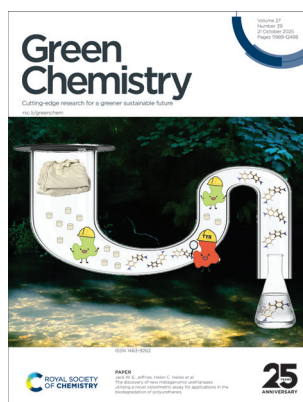
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ISSN 1463-9262 CODEN GRCHFJ 27(39) 11989–12488 (2025)



Cover
See Luigi Vaccaro *et al.*,
pp. 12166–12175.

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Inside cover
See Jack W. E. Jeffries,
Helen C. Hailes *et al.*,
pp. 12176–12186.

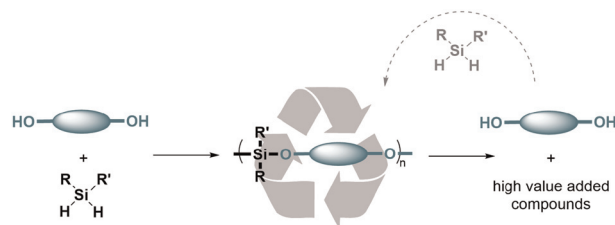
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12176.

TUTORIAL REVIEWS

12002

Construction and deconstruction: recent advances in degradable silicon-based polymers

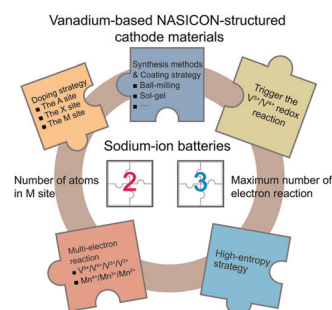
Xueying Liu, Jakhongir Bekmirzaev, Carine Robert, Régis M. Gauvin and Christophe M. Thomas*



12029

Recent advances in vanadium-based NASICON-structured cathode materials for sodium-ion batteries

Qianchen Wang,* LiYao Lu, Zhonghao Lv, Yuhang Xin, Zimo Zhang, Yingshuai Wang and Hongcai Gao*



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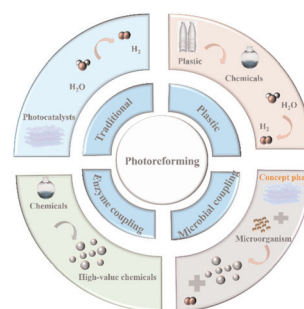
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TUTORIAL REVIEWS

12050

Plastic photoreforming: catalytic production of hydrogen and valuable chemicals

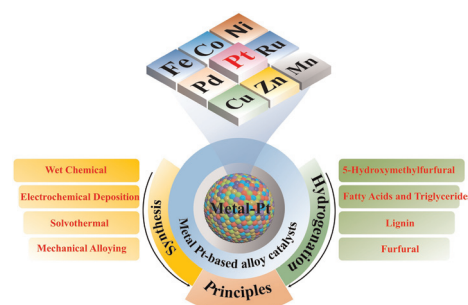
Heng Li, Yeqiong Huang, Yueyang Zhang, Haiyan Li, Chengcheng Shen, Dong Xia* and Yanmei Zheng*



12070

Recent progress in Pt-based alloy catalysts: a comprehensive review on green synthesis and sustainable biomass hydrogenation applications

Yichen Nie, Misbah Uddin, Qingtao Wang, Xingyong Li,* Na Liu, Senshen Yu, Phidsavard Keomeesay, Xuebing Zhao, Yubao Chen,* Zhifeng Zheng and Shijie Liu



PERSPECTIVES

12107

A proposal of twelve principles for LCA of chemicals

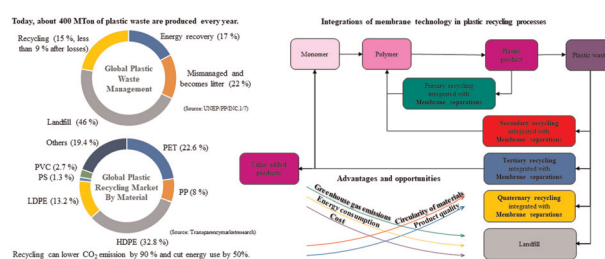
Daniele Cespi*

- The twelve principles for LCA of chemicals
- 1 Cradle to gate
 - 2 Consequential if under control
 - 3 Avoid to neglect
 - 4 Data collection from the beginning
 - 5 Different scales
 - 6 Data quality analysis
 - 7 Multi-impact
 - 8 Hotspot
 - 9 Sensitivity
 - 10 Results transparency, reproducibility and benchmarking
 - 11 Combination with other tools
 - 12 Beyond environment

12115

Unlocking the potential of plastic recycling processes with the integration of membrane technology: a focus on PET valorisation

Hamidreza Mahdavi,* Laila Halim, Selina Giles, Xiaoheng Jin, Leonie van 't Hag,* Zongli Xie,* Matthew R. Hill* and Benny D. Freeman*



COMMUNICATIONS

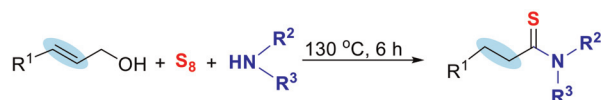
12151

Anisole									
MEK	D								
<i>n</i> -Butyl Acetate									
Cyclohexanone	E								
Chloroform									
Propylene Carbonate	F								
2,5-Dimethylfuran									P

The solvent miscibility table updated: miscibility and potential applications of green solvents

Olga Clavilier, Darragh Foy and Fergal Byrne*

12160



- No base
- No solvent
- Up to 97% yield
- Elemental sulfur as a mild oxidant and sulfur source

Synthesis of alkyl thioamides by three-component reactions of allyl alcohols, elemental sulfur and amines: elemental sulfur as a mild oxidant and a sulfur source

Jiyuan Wu, Yanyan Liao, Miaoyi Pan, Tangtang Song, Jian Zhang, Lai Li, Jianmei Lu* and Xuefeng Jiang*

PAPERS

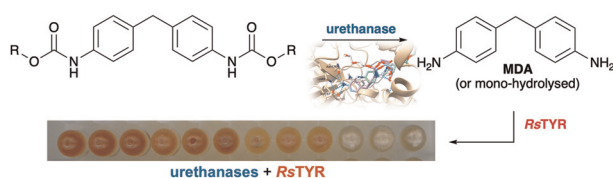
12166



Continuous flow tube-in-tube oxidation of HMF to FDCA using heterogeneous manganese catalyst under mild conditions

Federica Valentini, Francesco Ferlin and Luigi Vaccaro*

12176



The discovery of new metagenomic urethanases utilising a novel colorimetric assay for applications in the biodegradation of polyurethanes

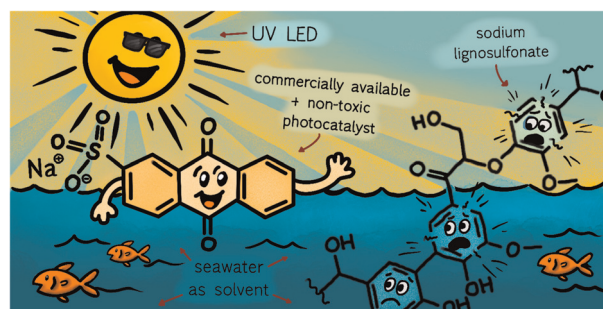
Silvia Anselmi, Yeke Ni, Alessia Tonoli, Jingyue Wu, Yu Wang, Luba Prout, Mark Miodownik, Jack W. E. Jeffries* and Helen C. Hailes*



12187

Swimming upstream – photocatalytic depolymerization of lignosulfonate in seawater

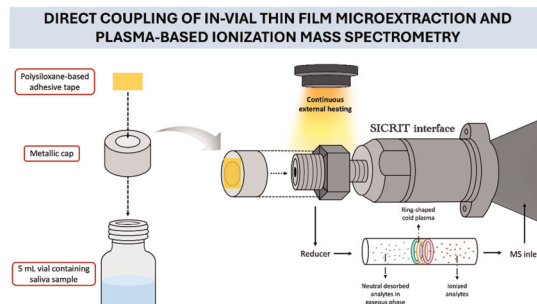
Nele Petersen, Silvia Carlotto, Björn B. Beele, Marcella Frauscher, Raphaela Süss, Pascal Olschowski, Girolamo Casella,* Adam Slabon* and Bruno V. M. Rodrigues*



12201

Integrating in-vial thin film microextraction using polysiloxane-based adhesive tapes with low-temperature plasma ionization mass spectrometry: A solvent-free approach for determining cocaine and methamphetamine in saliva samples

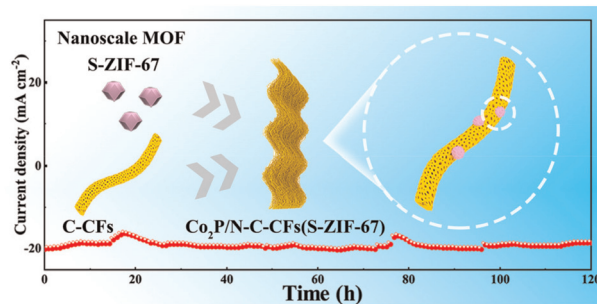
Carlos Calero-Cañuelo, Rafael Lucena* and Soledad Cárdenas



12211

Nanoscale MOF-derived vacancy-engineered Co₂P/N-doped coal-based carbon fibers for boosting hydrogen evolution

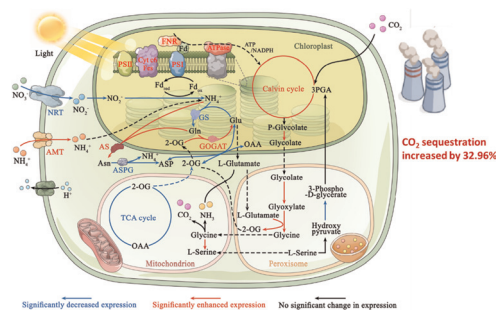
Mengran Lou, Ruiying Wang,* Luxiang Wang, Yang Wang, Mei Wu, Shengjiao Wen, Xia Kong, Taotao Lv and Bo Ma



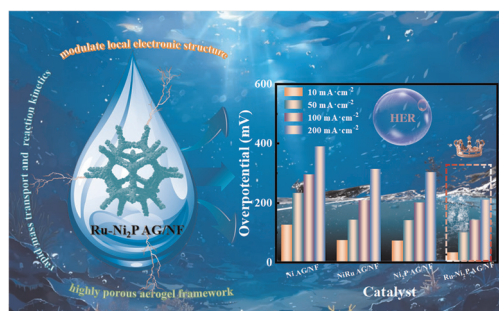
12222

Ammonium sulfate (a coking byproduct) downregulates the assimilatory nitrate pathway to save energy for carbon sequestration in *Nannochloropsis oceanica* at a stable pH using HEPES-NaOH

Ying Liu, Xiangjin Liang, Jun Lu, Yapeng Chen, Jun Liu, Baoying Wang, Ruixue Ma, Junchen Xu and Jun Cheng*



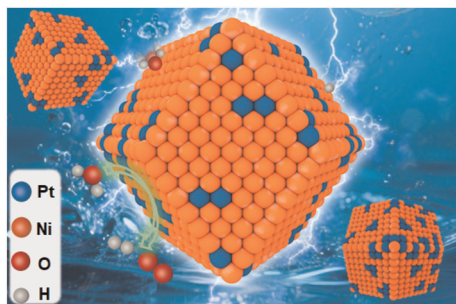
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Tailoring the electronic structure of an Ni₂P aerogel via ruthenium doping for energy-efficient hydrogen generation in anion-exchange membrane-based seawater electrolysis

Meitong Zhao, Junwei Yuan, Fan Yang,* Hongchen Liu, Xinyang Sun, Yang Sun, Siyuan Sun, Jiahui Liu and Yongfeng Li*

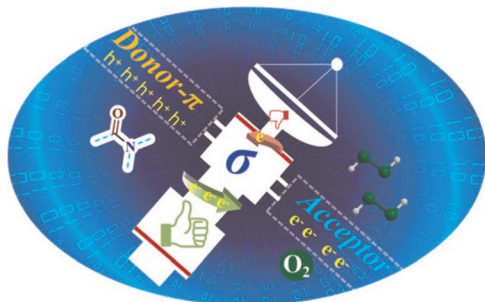
12250



Phase-segregated PtNi₅ rhombic dodecahedra enable excellent electrocatalytic hydrogen evolution in the full pH range

Siyuan Lai, Wendan Jiang, Jingzhe Zhao, Jun Yang* and Xiongwu Kang*

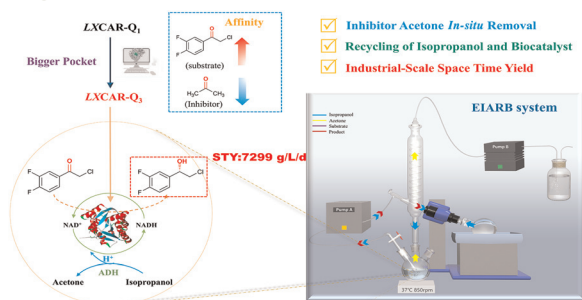
12259



A donor- π - σ -acceptor strategy in porous polymers for suppression of carrier recombination: boosting photoredox in a Csp²-N radical cross-coupling reaction

Jinyang Lu, Lingjuan Zhang,* Nan Zhang, Xueying Song, Qi Gao, Jincong Yuan and Xian-Ming Zhang*

12270



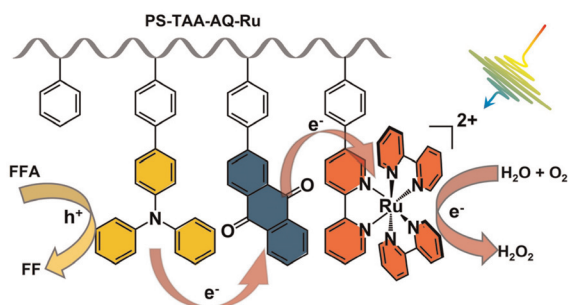
Breaking through acetone inhibition: integrated protein engineering and bioreactor design for sustainable chiral aryl alcohol synthesis

Feng Qian, Yaowu Wang, Zhe Wang, Hanyu Liu, Ying Zhang, Haimin Zhang and Pu Wang*



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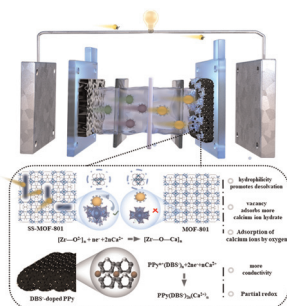
12333



Ternary engineered linear polymers with a controllable cascade electron transfer pathway for efficient H₂O₂ photosynthesis coupled with biomass conversion

Xueling Song, Jiani Peng, Xin Li, Pengyan Zhao, Xiaoqin Zhao and Lei Wang*

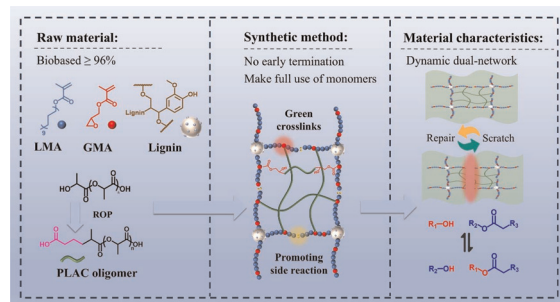
12341



Defect-engineered MOF-801 as a redox-active intercalation battery-type capacitive deionization cathode: mechanistic insights into selective calcium ion removal

Shu Zhou, Dong Wang, Huangzhao Wei, Hongchao Ma and Guowen Wang*

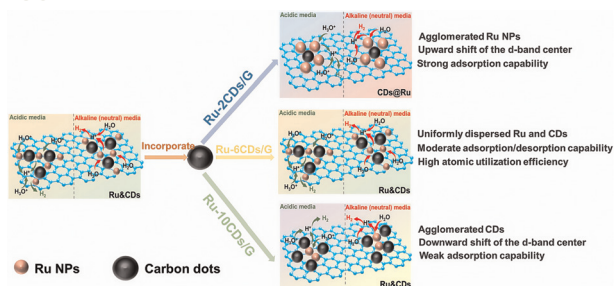
12353



One-pot synthesis of lignin-derived fully bio-based dynamic dual-network polymers via synergistic side reactions and star-shaped architectural design

Quan Yan, Bailiang Xue,* Xiaojie Xie, Wenliang Wang, Xiping Li, Xiaojun Shen, Xianzhi Meng and Wei Zhao

12364



Carbon dot-driven spatial and electronic modulation of Ru on graphene for pH-universal hydrogen evolution reaction electrocatalysts

Liwu Qiang, Meng Bai, Zonghang Liu, Peipei Zhao, Shuai He, Man Zhao,* Qinyun Yan, Wei Wen, Qilin Guo, Yanxia Zhang, He Xiao* and Jianfeng Jia*

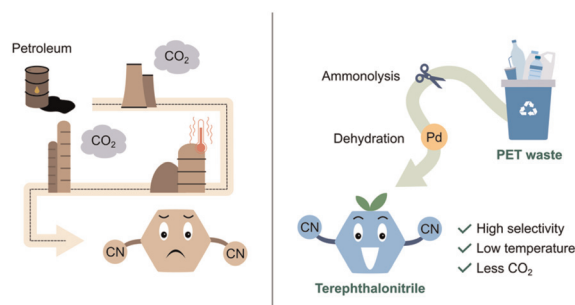


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12378

Upcycling of poly(ethylene terephthalate) waste plastics to terephthalonitrile

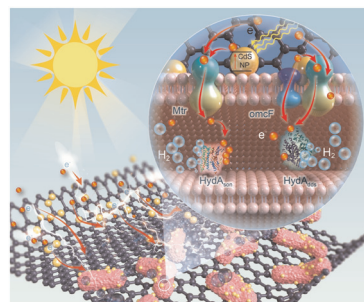
Phuc T. T. Nguyen, Jiong Cheng, Junyu Mi and Ning Yan*



12389

Modular engineering a *Shewanella oneidensis*-CdS@rGO artificial photosynthetic biohybrid to accelerate photoelectron transfer and conversion for enhanced hydrogen production

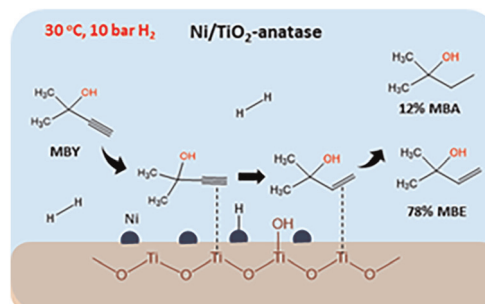
Wenliang Xu, Qijing Liu, Qinran Ding, Yan Zhang, Junqi Zhang, Chao Li, Huan Yu, Baocai Zhang, Jie Yang, Cheng Zhong, Wenyu Lu, Guosheng Xin, Hao Song* and Feng Li*



12403

Evaluation of Ni/TiO₂ catalysts in the semi-hydrogenation of alkynols under mild conditions in water

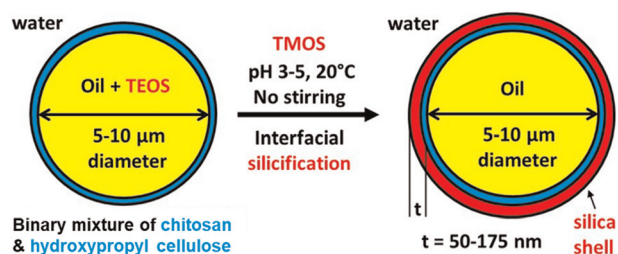
Ajay Tomer, Laurent Djakovitch and Noémie Perret*



12421

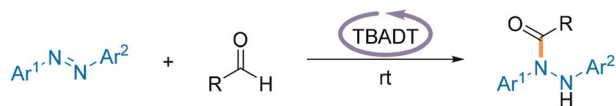
Sustainable silica microcapsules

O. Norvilaite, C. Lindsay, M. J. Rymaruk, P. Taylor and S. P. Armes*



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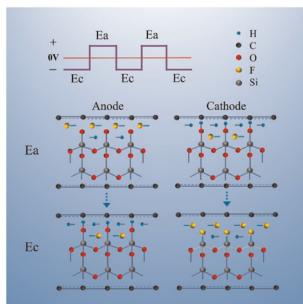


- readily available acylation reagent
- additive-free
- controllable
- broad scope
- base-free
- mild & efficient
- waste-free
- atom-economic

Decatungstate-photocatalyzed hydroacylation of azobenzenes with aldehydes to access *N,N'*-diarylmethanimines

Jingya Yang,* Bao Huang, Haifang Xu, Qi Dong, Xiaojun Liu, Kejing Huang and Hongyan Zhou*

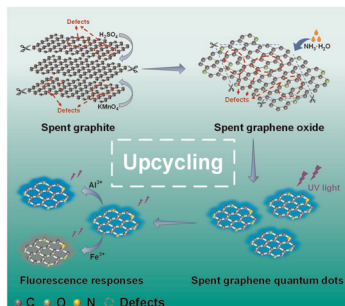
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Sustainable high-purity graphite purification via pulsed electrolysis with reduced fluoride consumption

Xianglin Liao, Yin Zhao, Yuehua Liu, Yiming Feng, Jingyao Wang,* Junhao Liu and Xuzhong Gong*

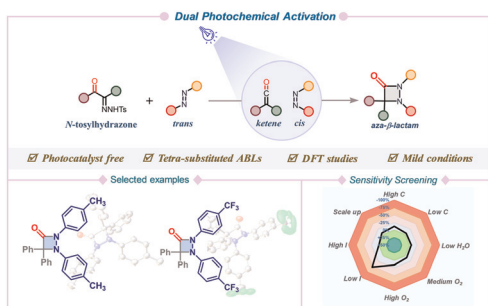
12460



In situ conversion of graphite into graphene quantum dots (GQDs) towards upcycling of spent lithium-ion batteries

Aoli Liu, Zelong Dai, Danlin Ouyang, Binod Mahara, Lishan Yang and Xiangping Chen*

12472



Visible light-driven modular synthesis of aza- β -lactams via a dual photochemical cascade

Imtiaz Ahmed, Nikita Gupta, Plaban Jyoti Sarma, Shilpa Neog and Vijay Kumar Das*



CORRECTION

12483

Correction: Hydrothermal liquefaction vs. fast/flash pyrolysis for biomass-to-biofuel conversion: new insights and comparative review of liquid biofuel yield, composition, and properties

Farid Alizad Ogghyanous and Cigdem Eskicioglu*

