

# Green Chemistry

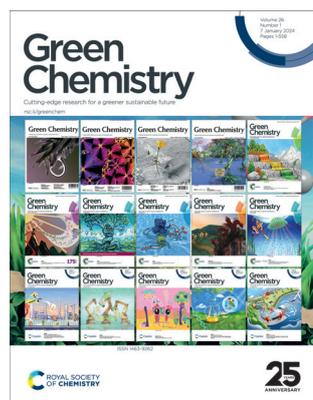
Cutting-edge research for a greener sustainable future

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Celebrating 25 years of covers on Green Chemistry



**Inside cover**  
See Yong-Dong Niu, Dong Li, Hai-Dong Xia *et al.*, pp. 323–329.

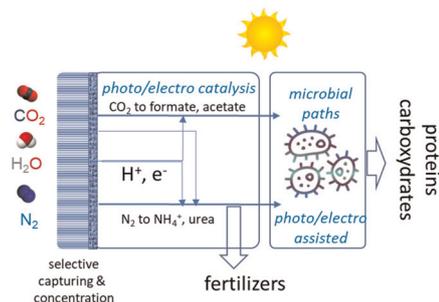
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Gabriele Centi\* and Siglinda Perathoner\*

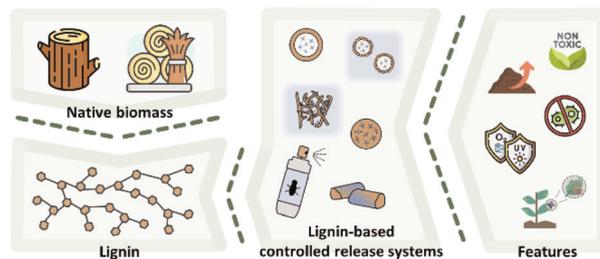


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### High-value utilization of lignin: construction of an intelligent release system for targeting the delivery of pesticides

Yitong Wang, Xiaona Yu, Shuaishuai Ma, Shuling Cao, Xufeng Yuan, Wanbin Zhu and Hongliang Wang\*

Empowering the reduction of pesticide application and enhancing efficacy in agriculture



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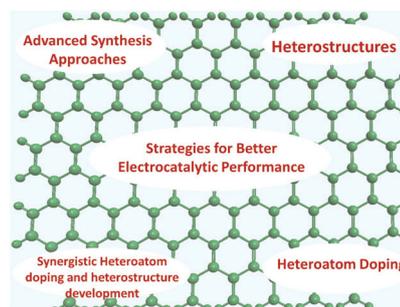
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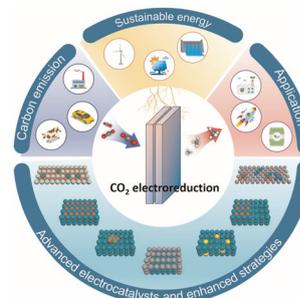
Reena Saini, Farha Naaz, Ali H. Bashal, Ashiq Hussain Pandit and Umar Farooq\*



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### Status and challenges for CO<sub>2</sub> electroreduction to CH<sub>4</sub>: advanced catalysts and enhanced strategies

Bingkun Li, Lu Liu, Mingzhu Yue, Qingman Niu, Min Li, Tianyu Zhang, Wenfu Xie\* and Qiang Wang\*

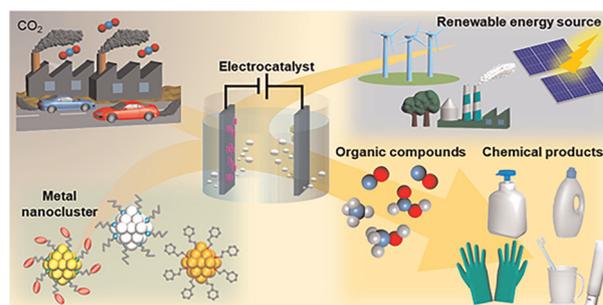


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### Atomically precise metal nanoclusters as catalysts for electrocatalytic CO<sub>2</sub> reduction

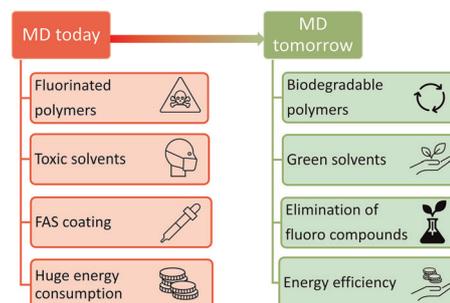
Tokuhisa Kawawaki,\* Tomoshige Okada, Daisuke Hirayama and Yuichi Negishi\*



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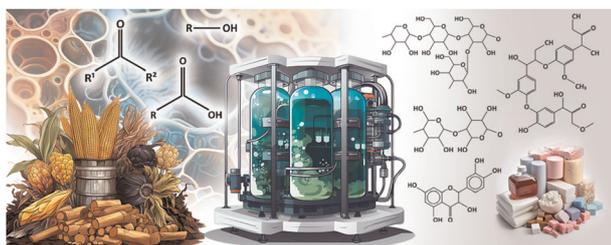
### How to make membrane distillation greener: a review of environmentally friendly and sustainable aspects

Emilia Gontarek-Castro\* and Roberto Castro-Muñoz



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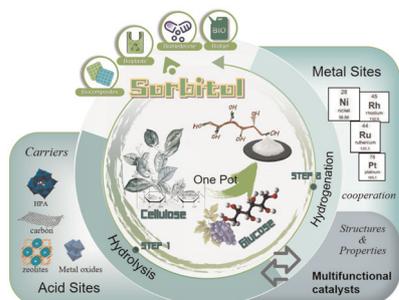
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Giorgio Tofani,\* Edita Jasiukaitytė-Grojzdek, Miha Grilc and Blaž Likozar\*

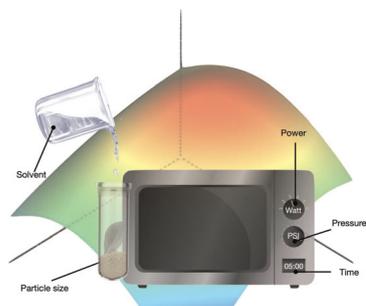
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### Combining DoE and MASE: a winning strategy for the isolation of natural bioactive compounds from plant materials

Valeria Cavalloro, Giorgio Marrubini,\* Giacomo Rossino, Emanuela Martino\* and Simona Collina

## COMMUNICATIONS

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- ◆ one-step synthesis
- ◆ ligand-free catalysis
- ◆ open vial operation
- ◆ cheap  $\text{CuBr}_2$  as catalyst
- ◆ 100% atom-economical
- ◆ valuable organosilanes

### Unexpected stereoselective $\text{CuBr}_2$ -catalyzed cascade reaction of 2-ethynylanilines with silylynamides: facile and atom-economical access to *N*-vinylsilylindoles

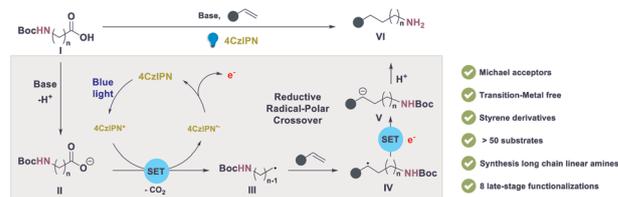
Zengzeng Li, Fei Lu, Qingchun Xu, Gang Liu, Ximei Zhao\* and Guanghui Wang\*



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### Selective synthesis of functionalized linear aliphatic primary amines *via* decarboxylative radical-polar crossover

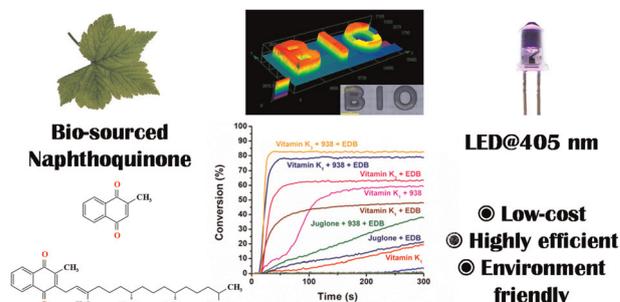
Robin Cauwenbergh, Prakash Kumar Sahoo, Rakesh Maiti, Abra Mathew, Rositha Kuniyil and Shoubhik Das\*



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### Photoinitiators from bio-sourced naphthoquinone – the application of naphthoquinone-based vitamins K1 and K3 in free radical photopolymerization

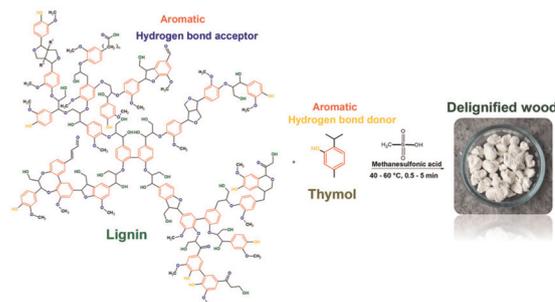
Timur Borjigin, Ji Feng, Michael Schmitt, Di Zhu, Fabrice Morlet-Savary, Pu Xiao\* and Jacques Lalevée\*



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### Supramolecular interaction-driven delignification of lignocellulose

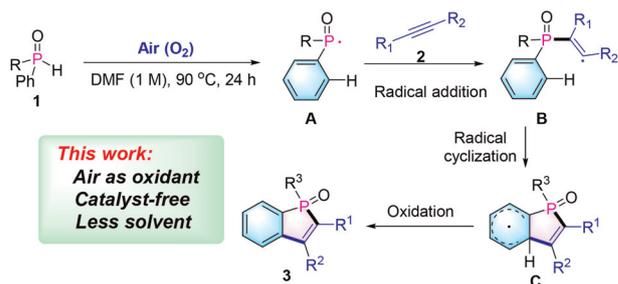
Juho Antti Sirviö,\* Idamaria Romakkaniemi, Juha Ahola, Svitlana Filonenko, Juha P. Heiskanen and Ari Ämmälä



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### Direct air-induced arylphosphinoyl radicals for the synthesis of benzo[*b*]phosphole oxides

Mingqing Huang, Haiyang Huang,\* Mengyao You, Xinxin Zhang, Longgen Sun, Chao Chen, Zhichao Mei, Ruchun Yang and Qiang Xiao\*



## COMMUNICATIONS

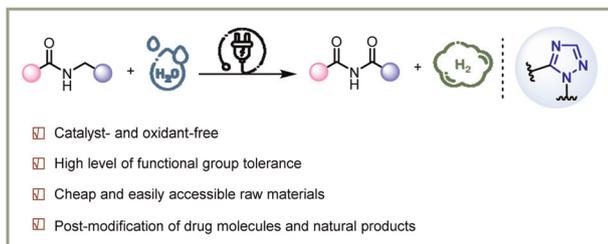
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### Photocatalytic synthesis of 2,3-diamines from anilines and DIPEA via C–N bond cleavage and C–C bond formation

Yunyan Meng, Chunxiang Pan, Na Liu, Hongjiang Li, Zixiu Liu, Yao Deng, Zixiang Wei, Jianbin Xu\* and Baomin Fan\*

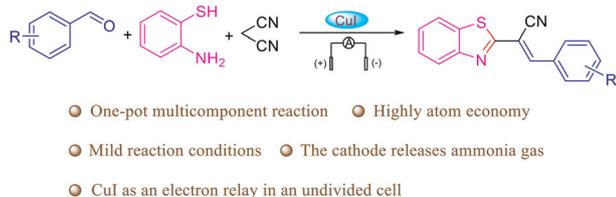
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### Sustainable electrocatalytic oxidation of N-alkylamides to acyclic imides using H<sub>2</sub>O

Jing Qi, Xiyan Wang, Gan Wang, Srinivas Reddy Dubbaka, Patrick O'Neill, Hwee Ting Ang\* and Jie Wu\*

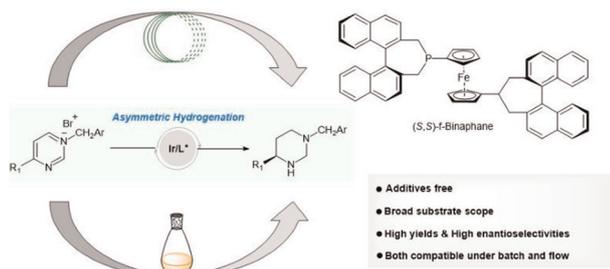
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### Cu-Catalyzed, electron-relayed three-component synthesis of 2-alkenylbenzothiazoles with cathodic ammonia evolution

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### Iridium-catalyzed asymmetric, complete hydrogenation of pyrimidinium salts under batch and flow

Zhi Yang, Yu Chen, Linxi Wan, Yuxiao Li, Dan Chen, Jianlin Tao, Pei Tang\* and Fen-Er Chen\*

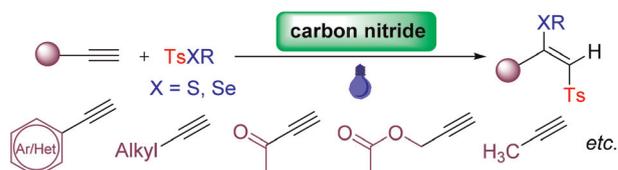


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### Visible-light-driven graphitic carbon nitride-catalyzed ATRA of alkynes: highly regio- and stereoselective synthesis of (*E*)- $\beta$ -functionalized vinylsulfones

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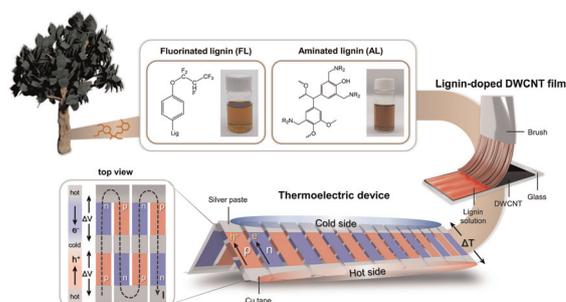


- heterogeneous photocatalysis
- recyclable photocatalyst
- excellent regio- and stereoselectivity
- 100% atom economy
- broad substrate scope (>60 examples)
- metal and additive free

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### Eco-friendly conversion between n- and p-type carbon nanotubes based on rationally functionalized lignin biopolymers

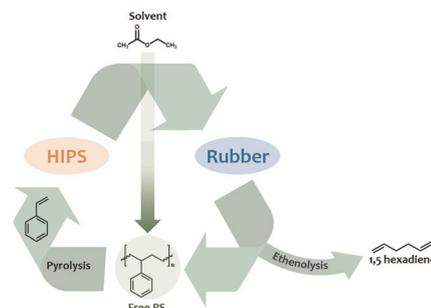
Yoohyeon Choi, Ngoc Tuan Tran, Doojoon Jang, Minju Park, Chun-Jae Yoo, Jin Young Kim, Hyunjoon Lee\* and Heesuk Kim\*



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### Total revalorization of high impact polystyrene (HIPS): enhancing styrene recovery and upcycling of the rubber phase

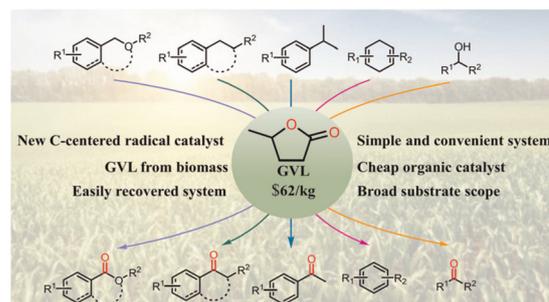
Nikolaos S. Giakoumakis, Christophe Vos, Kwinten Janssens, Jelle Vekeman, Mats Denayer, Frank De Proft, Carlos Marquez\* and Dirk De Vos\*



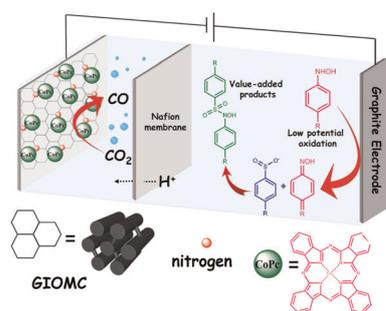
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### A simple and convenient strategy for the oxidation of C(sp<sup>3</sup>)-H bonds based on $\gamma$ -valerolactone

Anwei Wang, Jiayin Huang, Chunsheng Zhao, Yu Fan, Junfeng Qian, Qun Chen, Mingyang He\* and Weiyu Zhou\*



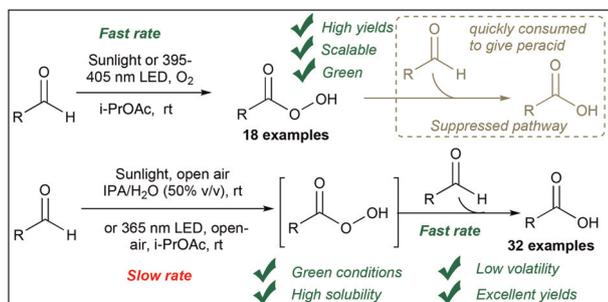
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### Robust interaction of cobalt phthalocyanine and nitrogen-doped ordered mesoporous carbon for CO<sub>2</sub> reduction paired with the electro-oxidative synthesis of sulfonamide derivatives

Samin Barat-Abtahi, Faranak Jafari-Hafshejani, Fahimeh Varmaghani,\* Babak Karimi\* and Hamzeh H. Veisi

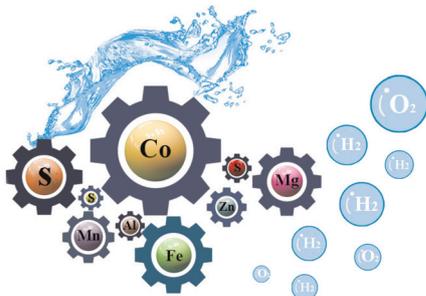
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### Light-induced autoxidation of aldehydes to peracids and carboxylic acids

Mohamed S. H. Salem, Carla Dubois, Yuya Takamura, Atsuhito Kitajima, Takuma Kawai, Shinobu Takizawa\* and Masayuki Kirihara\*

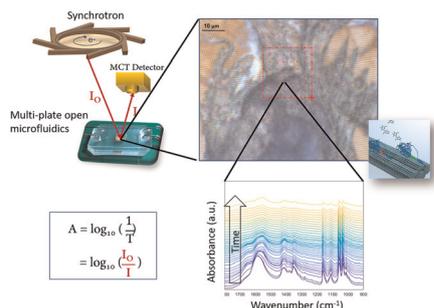
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### A novel high-entropy sulfide (ZnCoMnFeAlMg)<sub>9</sub>S<sub>8</sub> as a low potential and long life electrocatalyst for overall water splitting in experiments and DFT analysis

Shun Li, Likai Tong, Zhijian Peng, Bo Zhang and Xiuli Fu\*

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### Spatiotemporal dynamics of cellulose during enzymatic hydrolysis studied by infrared spectromicroscopy

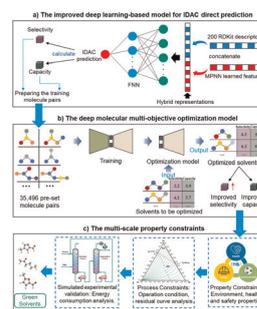
Tina Jeoh,\* Jennifer Danger Nill, Wujun Zhao, Sankar Raju Narayanasamy, Liang Chen and Hoi-Ying N. Holman\*



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## Multi-objective optimization strategy for green solvent design via a deep generative model learned from pre-set molecule pairs

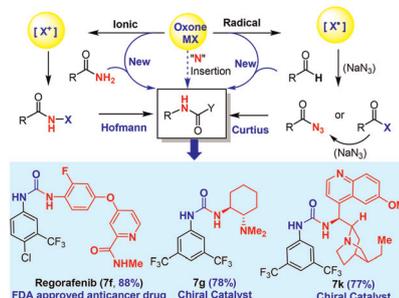
Jun Zhang, Qin Wang,\* Huaqiang Wen, Vincent Gerbaud, Saimeng Jin and Weifeng Shen\*



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## Unified and green oxidation of amides and aldehydes for the Hofmann and Curtius rearrangements

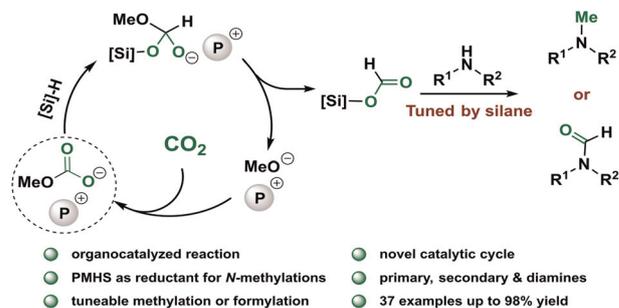
Liyan Song,\* Yufei Meng, Tongchao Zhao, Lifang Liu, Xiaohong Pan, Binbin Huang, Hongliang Yao, Ran Lin\* and Rongbiao Tong\*



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## Tunable reduction of CO<sub>2</sub> – organocatalyzed selective formylation and methylation of amines

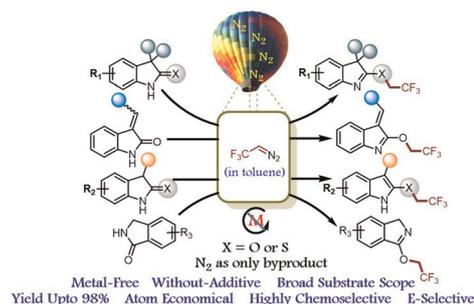
Changyue Ren, Constanza Terazzi and Thomas Werner\*



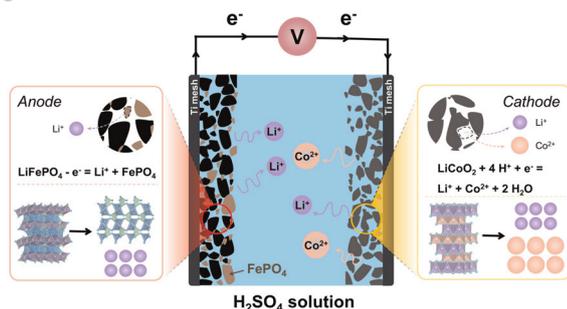
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## Metal- and additive-free TfOH catalyzed chemoselective *O*- and *S*-trifluoroethylation of oxindoles, isoindolines and thio-oxindoles

Manisha Lamba, Praseon Raj Singh, Shubham Bhatt and Avijit Goswami\*



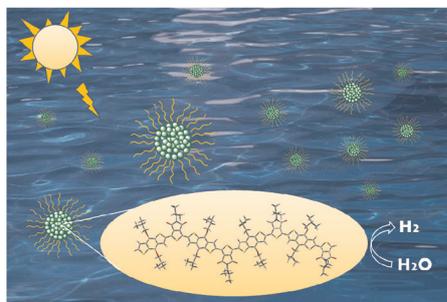
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### Co-recovery of spent $\text{LiCoO}_2$ and $\text{LiFePO}_4$ by paired electrolysis

Jingjing Zhao, Fengyin Zhou, Hongya Wang, Xin Qu, Danfeng Wang, Zhiyu Zheng, Yuqi Cai, Shuaibo Gao,\* Dihua Wang and Huayi Yin\*

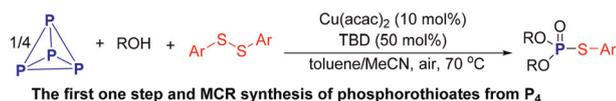
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### Green and sustainable synthesis of TPD-based donor-acceptor-type conjugated polymer photocatalysts for hydrogen production under visible light

Menghan Chang, Xinjuan Zhang, Lin Wang, Di Wang, Qiang Zhang\* and Yan Lu\*

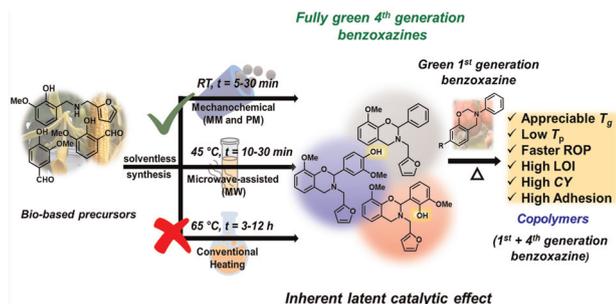
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### Three-component coupling reaction of white phosphorus, alcohols and diaryl disulfides: a chlorine-free avenue for accessing phosphorothioates

Yinwei Cao, Mengpei Bai, Junwei Huang, Fushan Chen,\* Yan Liu, Guo Tang\* and Yufen Zhao

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### The mechanochemical synthesis of environmentally benign fully biobased 4<sup>th</sup> generation benzoxazines and their polymers: mechanistic insights into the catalytic activity of latent catalysts

Vaishaly Duhan, Shivani Yadav, Christophe Len and Bimlesh Lochab\*

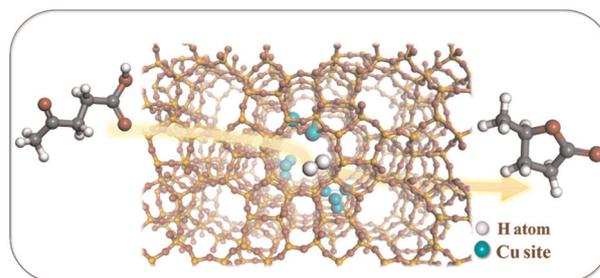


## PAPERS

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## MFI zeolite with confined adjustable synergistic Cu sites for the hydrogenation of levulinic acid

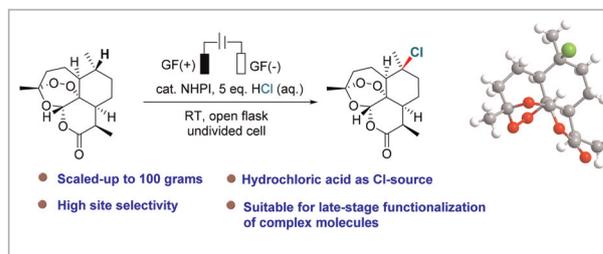
Wanying Liang, Guangyue Xu,\* Xiang Zhang, Huiyong Chen and Yao Fu\*



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Electrochemical chlorination of least hindered tertiary and benzylic C(sp<sup>3</sup>)-H bonds

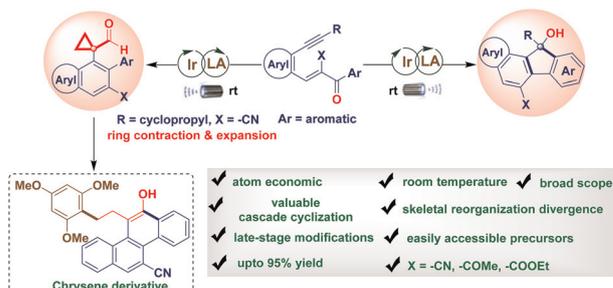
Jianguo Zhao, Jiatai Zhang, Pengkai Fang, Jintao Wu, Fan Wang and Zhong-Quan Liu\*



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## Visible light-driven highly atom-economical divergent synthesis of substituted fluorenols and cyclopropylcarbaldehydes

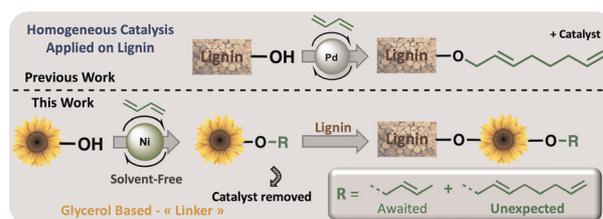
Babasaheb Sopan Gore, Lin-Wei Pan, Jun-Hao Lin, Yi-Chi Luo and Jeh-Jeng Wang\*



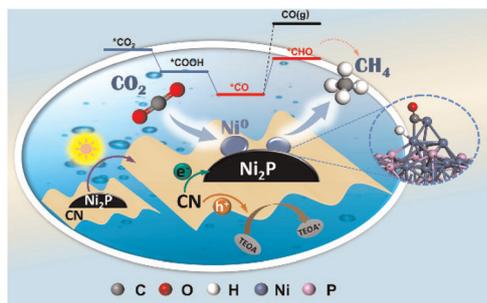
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## Efficient nickel-catalysed telomerisation on glycerol carbonate: a new linker route for lignin functionalisation

Tiphaine Richard, Walid Abdallah, Xavier Trivelli, Mathieu Sauthier and Clément Dumont\*



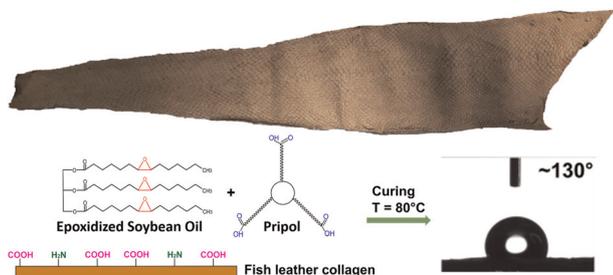
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### The synergy of *in situ*-generated Ni<sup>0</sup> and Ni<sub>2</sub>P to enhance CO adsorption and protonation for selective CH<sub>4</sub> production from photocatalytic CO<sub>2</sub> reduction

Xuemei Liu, Chaonan Cui, Shuoshuo Wei, Jinyu Han, Xinli Zhu, Qingfeng Ge\* and Hua Wang\*

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### Hydrophobic and water resistant fish leather: a fully sustainable combination of discarded biomass and by-products of the food industry

Marta Fadda,\* Arkadiusz Zych, Riccardo Carzino, Athanassia Athanassiou and Giovanni Perotto\*

