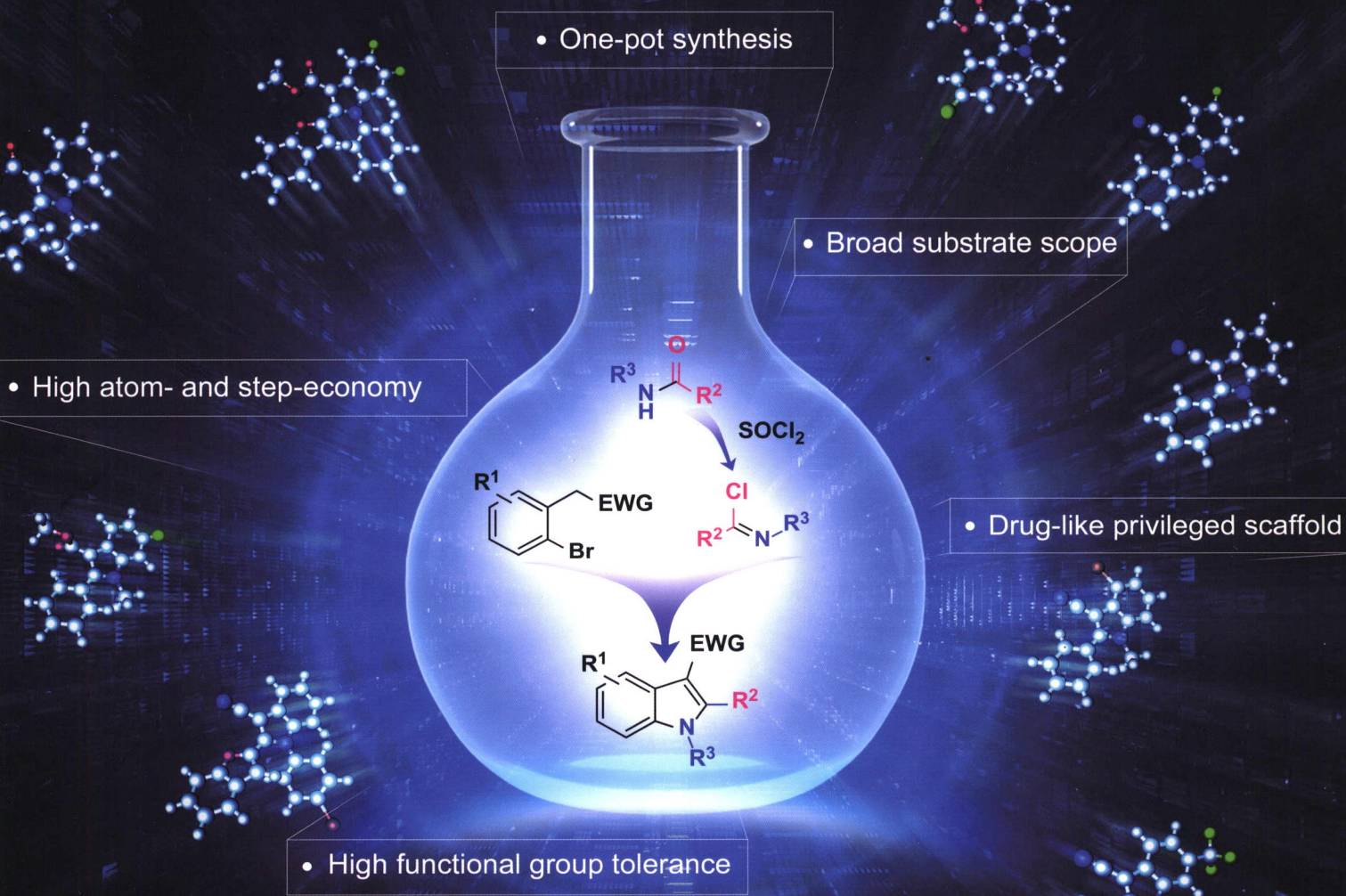


# 化学学报

## ACTA CHIMICA SINICA

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# 化学学报

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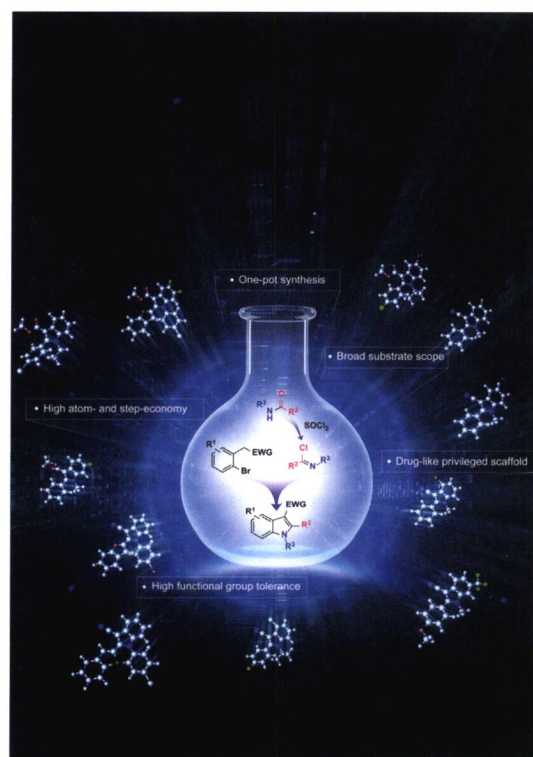
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- Pt<sub>0.01</sub>Fe<sub>0.05</sub>-g-C<sub>3</sub>N<sub>4</sub> 催化剂高效光热催化二氧化碳还原 ..... 王瑞兆, 邹云杰, 洪晟, 徐铭楷, 凌岚\*, 化学学报, 2021, 79(7), 932-940
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\* 通信联系人.

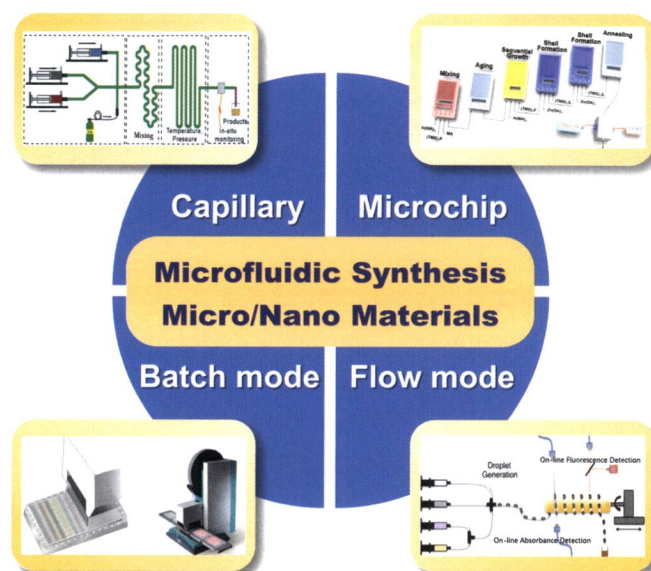


**On the cover:** By making use of the active imidoyl chloride-mediated cascade reaction to form various heterocycles, a new one-pot synthesis of the 3-cyano or carboxylate-indole derivatives was developed, enabling an efficient and diversity-oriented construction of drug-like privileged scaffolds-based combinatorial library. [Ya-Qiu Long *et al.* on page 903-907.]



### Review

#### Research Progress of Microfluidic Technique in Synthesis of Micro/Nano Materials



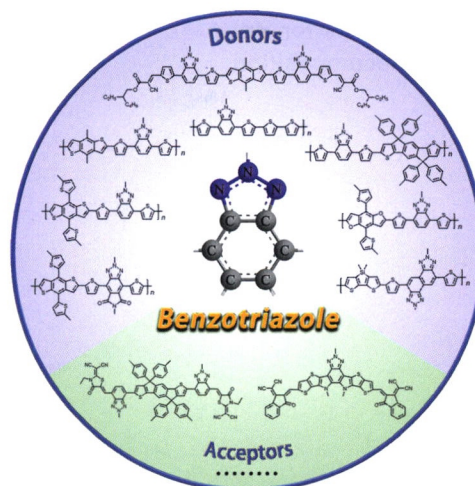
Jia-Min Lu, Hui-Feng Wang, Jian-Zhang Pan, Qun Fang\*

*Acta Chim. Sinica* **2021**, 79(7), 809-819

## Research Advances on Benzotriazole-based Organic Photovoltaic Materials

Yang Bai, Ling-Wei Xue\*, Hai-Qiao Wang, Zhi-Guo Zhang\*

*Acta Chim. Sinica* **2021**, 79(7), 820-852

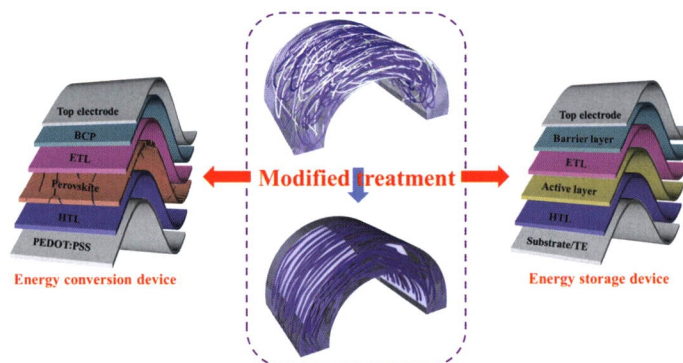


As a typical electron-deficient penta-heterocycle, benzotriazoles (BTAs) derives a variety of high-performance photovoltaic materials, which promoted the rapidly rising of organic solar cells. Here, this review focuses on the research progress on BTA-based photovoltaic materials and related molecular design strategies developed in recent years, and also presents perspective on its future development.

## Recent Advances of PEDOT in Flexible Energy Conversion and Storage Devices

Chenxiang Gong, Shuping Cheng, Xiangchuan Meng, Xiaotian Hu\*, Yiwang Chen\*

*Acta Chim. Sinica* **2021**, 79(7), 853-868

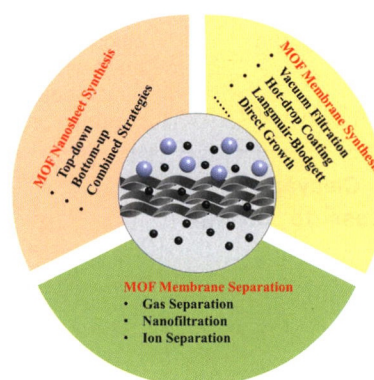


The modified-PEDOT (poly(3,4-ethylenedioxythiophene)) is accompanied by the improvement of electrical conductivity and the orderly arrangement of conformation, and the corresponding flexible devices also show excellent performance.

## Preparation of Two-Dimensional Metal-Organic Framework Membranes and Their Applications in Separation

Luxi Lyu, Yali Zhao, Yanying Wei\*, Haihui Wang\*

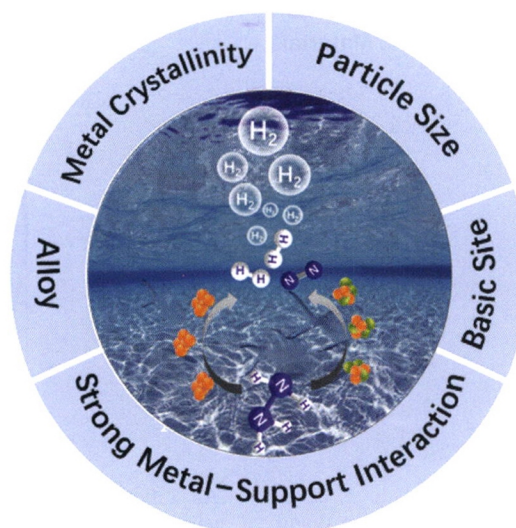
*Acta Chim. Sinica* **2021**, 79(7), 869-884



Two-dimensional (2D) metal-organic framework (MOF) membranes are expected to show both high permeability and selectivity in separations, which become a kind of potential high-performance membrane for industrial separations. This review introduces the preparation methods of 2D MOF nanosheets, including top-down, bottom-up and combined strategies; the synthesis methods of 2D MOF nanosheets membranes, including vacuum filtration, hot-drop coating, Langmuir-Blodgett, direct growth and other potential methods; as well as the applications of 2D MOF membranes in separations, including gas separation, nanofiltration and ion separation.



## Recent Progress on Catalysts for Hydrogen Evolution from Decomposition of Hydrous Hydrazine



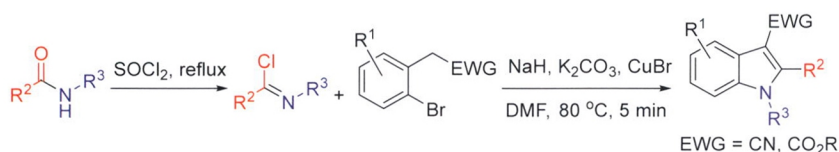
Hydrous hydrazine ( $\text{N}_2\text{H}_4 \cdot \text{H}_2\text{O}$ ) has been considered as a promising hydrogen storage material due to its high hydrogen content ( $w=8.0\%$ ), the advantage of CO-free  $\text{H}_2$  production, and facile recharging as a stable liquid. The study of catalysts is the key for efficient dehydrogenation of  $\text{N}_2\text{H}_4 \cdot \text{H}_2\text{O}$ . In this paper, we review the research progress on catalysts for hydrogen production from  $\text{N}_2\text{H}_4 \cdot \text{H}_2\text{O}$ , analyze the dehydrogenation mechanism, and discuss the strategies for improving the selectivity and activity of catalysts. The review can provide a guidance for the developing more efficient catalysts for hydrogen production from hydrous hydrazine in the future.

Anqi Zhang, Qilu Yao, Zhang-Hui Lu\*

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### Communication

#### Imidoyl Chloride Mediated One-Pot Synthesis of 3-Electron Withdrawing Group Substituted Indoles



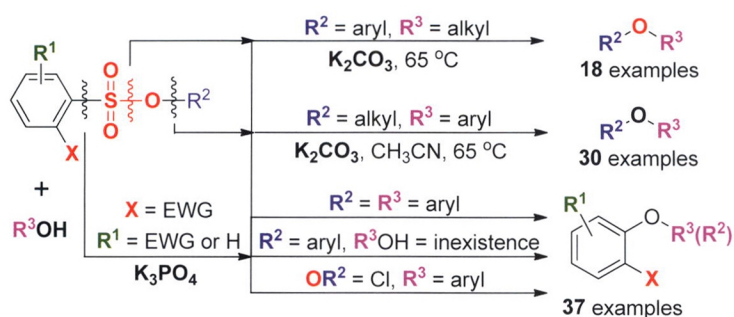
- One-pot synthesis
- Broad substrate scope
- High functional group tolerance
- 37 examples, up to 85% yield

Linjun Zhan, Wei Hu, Mei Wang, Bin Huang, Ya-Qiu Long\*

*Acta Chim. Sinica* **2021**, 79(7), 903-907

A new one-pot synthesis of 3-cyano/carboxylate-indole derivatives through an imidoyl chloride-mediated cascade reaction was developed. This synthetic methodology is featured with cheap and readily available starting materials, high reaction yields, high functional group tolerance and broad substrate scope. This reaction is a direct synthesis not requiring prefunctionalization, and highly atom- and step-economic.

#### Different Bonds Cleavage of Arenesulfonates: Access to Diverse Aryl Ethers



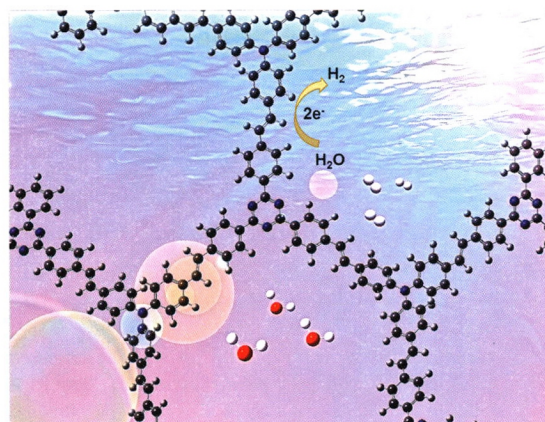
Yongsheng Fang, Wenhui Li, Jianying Lin, Xing Li\*

*Acta Chim. Sinica* **2021**, 79(7), 908-913

The construction of aryl alkyl ethers and diaryl ethers via different bonds cleavage of arenesulfonates as starting materials is described. The formation of diaryl ethers is also realized through the reaction of arenesulfonyl chlorides with phenols.

## Article

## Olefin-linked Conjugated Porous Networks and Their Visible-Light-Driven Hydrogen Evolution Performance

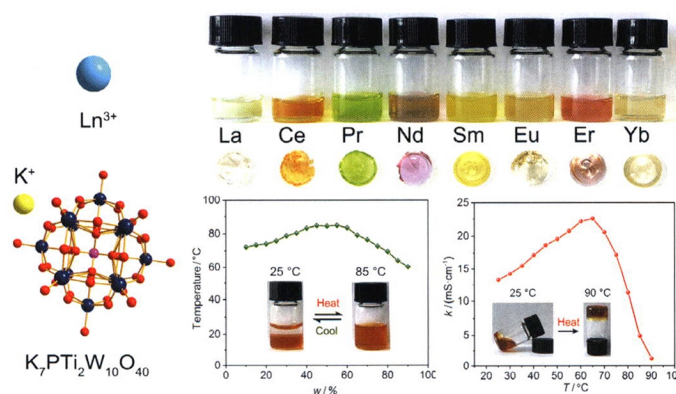


Wangping Ma, Yanyan He, Honglai Liu\*

*Acta Chim. Sinica* 2021, 79(7), 914-919

Two stable olefin-linked porous networks were synthesized under mild reaction condition, which can be used as efficient photocatalysts for hydrogen production via water splitting.

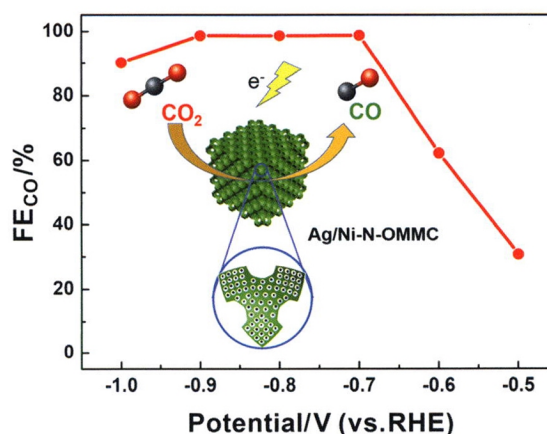
## Synthesis and Properties of a Series of Pure Inorganic Ionic Liquids Based on Rare Earth Cations and Polyoxometalates



He-Nan Wang, An-Ge Zhang, Zhong Zhang, Hong-Rui Tian, Qian Yue, Xue Zhao, Ying Lu, Shu-Xia Liu\*

*Acta Chim. Sinica* 2021, 79(7), 920-924

A series of lanthanide-containing inorganic ionic liquids based on a Ti-substituted Keggin-type polyoxometalate,  $\text{KLnH}_3\text{PTi}_2\text{W}_{10}\text{O}_{40} \cdot x\text{H}_2\text{O}$  [ $\text{Ln} = \text{La}$  (1),  $\text{Ce}$  (2),  $\text{Pr}$  (3),  $\text{Nd}$  (4),  $\text{Sm}$  (5),  $\text{Eu}$  (6),  $\text{Er}$  (7),  $\text{Yb}$  (8)] were synthesized and studied. The series of pure inorganic ionic liquids exhibit unique properties.

Nickel-Nitrogen-Doped Ordered Macro-/Mesoporous Carbon Supported Ag Nanoparticles for Efficient Electrocatalytic  $\text{CO}_2$  Reduction

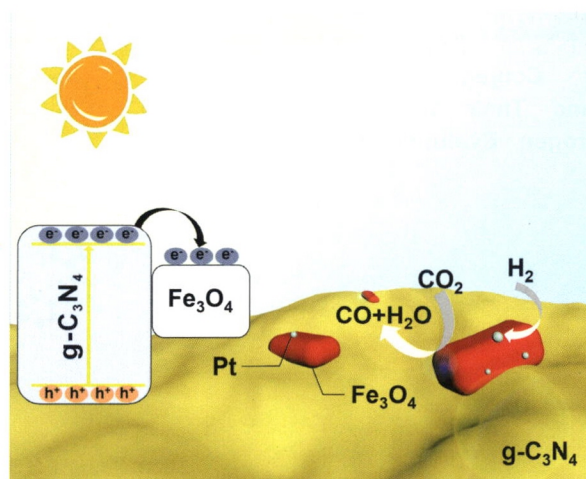
Chunhui Mu, Yixin Zhang, Wei Kou, Lianbin Xu\*

*Acta Chim. Sinica* 2021, 79(7), 925-931

Nickel-nitrogen-doped ordered macro-/mesoporous carbon supported Ag nanoparticles composite (Ag/Ni-N-OMMC) shows a wide operating voltage range with the Faradaic efficiency of CO over 90% at  $-0.7 \sim -1.0$  V vs. reversible hydrogen electrode (RHE) in  $0.1 \text{ mol} \cdot \text{L}^{-1}$   $\text{KHCO}_3$  solution for the  $\text{CO}_2$  reduction reaction.



### High-performance $\text{Pt}_{0.01}\text{Fe}_{0.05}\text{-g-C}_3\text{N}_4$ Catalyst for Photothermal Catalytic $\text{CO}_2$ Reduction

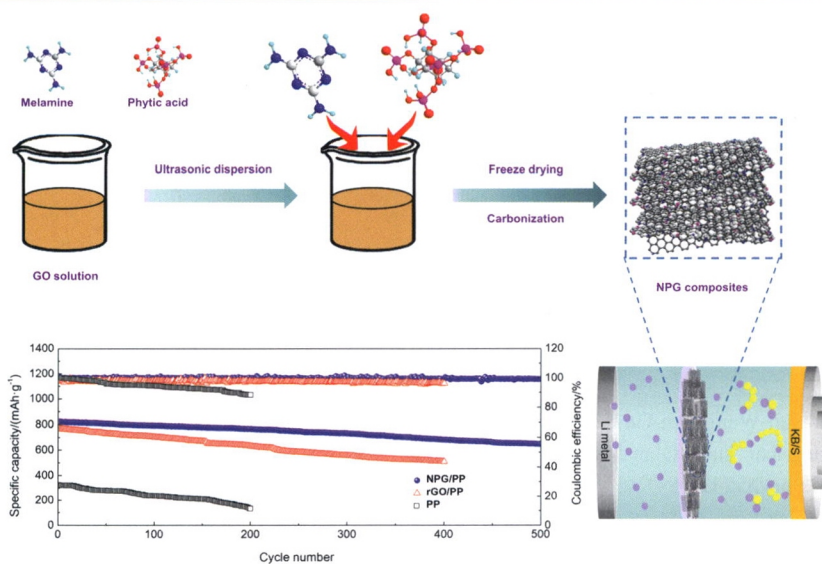


Ruizhao Wang, Yunjie Zou, Sheng Hong, Mingkai Xu, Lan Ling\*

*Acta Chim. Sinica* **2021**, 79(7), 932-940

A nano-structured  $\text{Pt}_{0.01}\text{Fe}_{0.05}\text{-g-C}_3\text{N}_4$  hybrid catalyst with suppressed photogenerated carrier recombination process is prepared for catalytic photothermal  $\text{CO}_2$  reduction.  $\text{CO}_2$  and  $\text{H}_2$  are separately activated particularly.

### Hierarchical Porous N, P co-doped rGO Modified Separator to Enhance the Cycling Stability of Lithium-sulfur Batteries

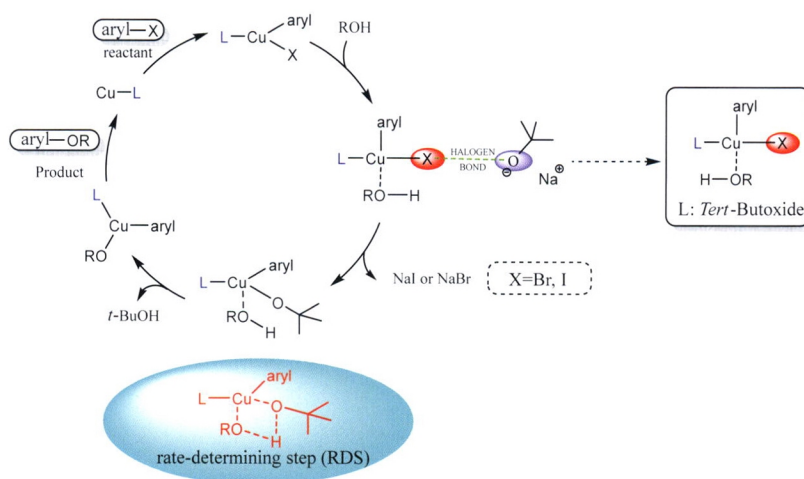


Feng Chen, Xiaoqin Cheng, Zhenxin Zhao, Xiaomin Wang\*

*Acta Chim. Sinica* **2021**, 79(7), 941-947

In this paper, N, P co-doped reduced graphene oxide (NPG) is fabricated by one-step high-temperature reduction method. The highly conductive NPG with abundant hierarchical porous structure provides numerous adsorption sites and sufficient ion/electron transport channels, enhancing the chemical adsorption capability and conversion kinetics of lithium polysulfides (LiPSs). As a result, NPG modified polypropylene (PP) separator (NPG/PP) exhibits better cycling stability than reduced graphene oxide (rGO) modified PP separator (rGO/PP) and PP.

### DFT Mechanism of Cu Catalyzed Coupling Reaction to Alkyl Aryl Ethers



Qingmin Man, Zunyun Fu, Tiantian Liu,  
Mingyue Zheng\*, Hualiang Jiang\*

*Acta Chim. Sinica* **2021**, 79(7), 948-952

The catalytic cycle starts from the *in-situ* formation of cuprous complex which undergo oxidative addition to give Cu(III) complexes. The Cu(III) complex is coordinated with alcohol to form a four-coordinated Cu(III) complex. Then the substrate is activated by O-halogen bond, and the intermediates underwent ligand exchange to form Cu(III) complexes, which transmits the desired alkyl aryl ethers and regenerates the catalyst.



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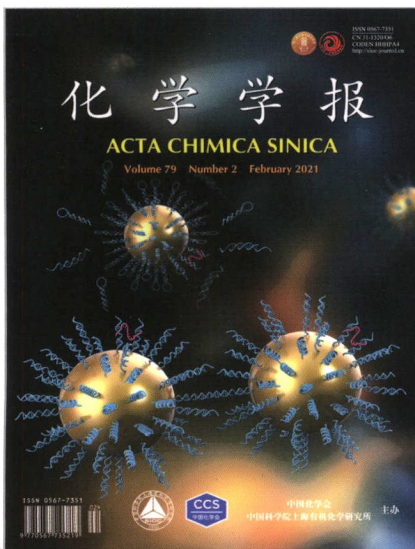
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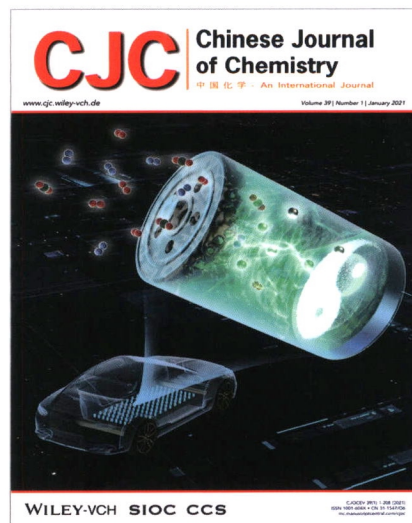
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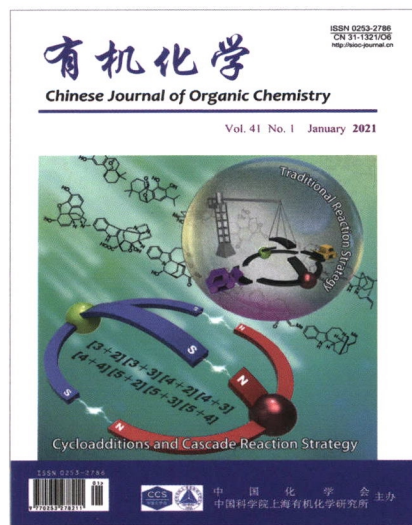
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