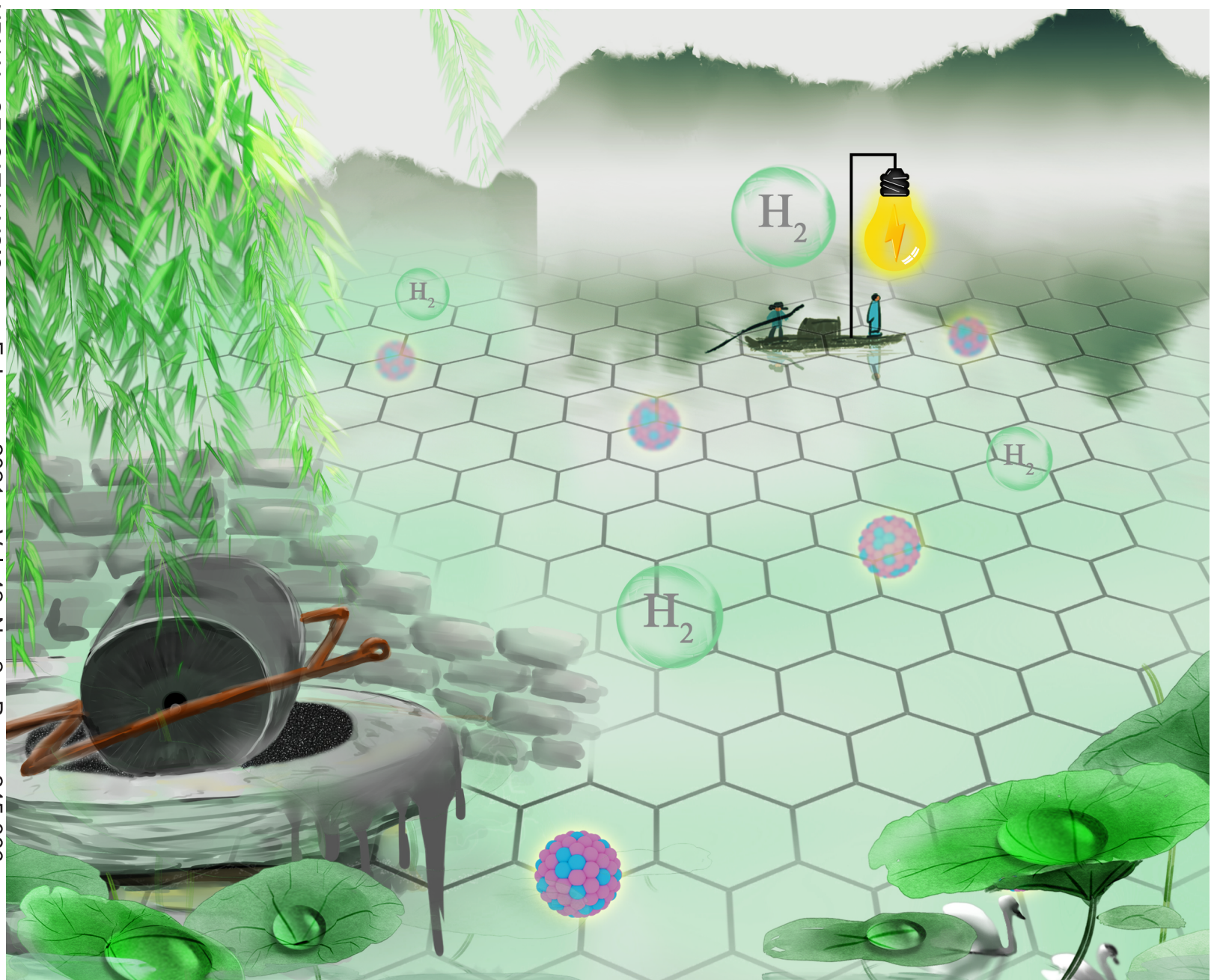




# Chinese Journal of Catalysis

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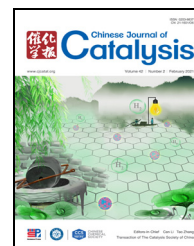
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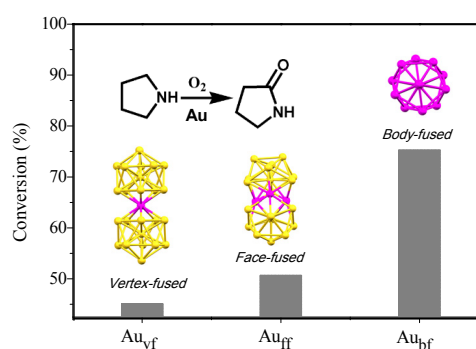
## Chinese Journal of Catalysis

## Graphical Contents

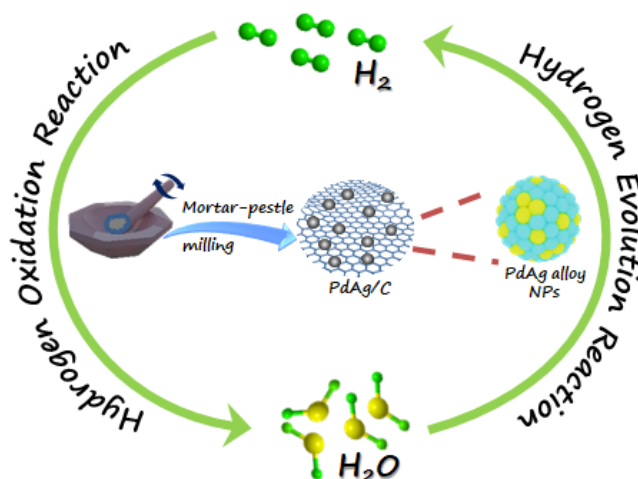
## Communication

*Chin. J. Catal.*, 2021, 42: 245–250 doi: 10.1016/S1872-2067(20)63659-2**Evolution of catalytic activity driven by structural fusion of icosahedral gold cluster cores**Dan Yang, Yan Zhu \*  
Nanjing University

Atomically precise gold cluster catalysts have emerged as a new frontier in catalysis science and exhibited unexpected catalytic properties. Here, we demonstrate that the structural fusion of icosahedral Au<sub>13</sub> cores to form vertex-fused (vf), face-fused (ff), and body-fused (bf) structures can control the catalytic activity of the clusters.



## Articles

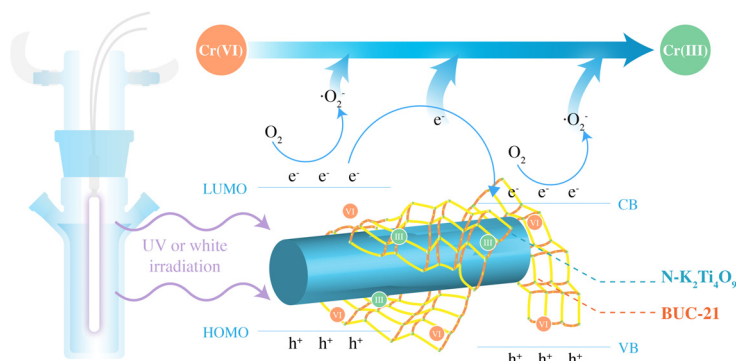
*Chin. J. Catal.*, 2021, 42: 251–258 doi: 10.1016/S1872-2067(20)63650-6**Sustainable solid-state synthesis of uniformly distributed PdAg alloy nanoparticles for electrocatalytic hydrogen oxidation and evolution**Caili Xu, Qian Chen, Rong Ding, Shengtian Huang, Yun Zhang \*, Guangyin Fan \*  
Sichuan Normal University; Sichuan University of Science and Engineering

A facile grinding strategy is developed to produce a series of PdAg alloy NPs that are highly dispersed on various carbon supports. The resulting electrocatalysts exhibit excellent activities and stabilities in both the HOR and HER.

*Chin. J. Catal.*, 2021, 42: 259–270 doi: 10.1016/S1872-2067(20)63629-4

### Photocatalytic Cr(VI) elimination over BUC-21/N-K<sub>2</sub>Ti<sub>4</sub>O<sub>9</sub> composites: Big differences in performance resulting from small differences in composition

Xun Wang, Yu-Xuan Li, Xiao-Hong Yi, Chen Zhao, Peng Wang, Jiguang Deng\*, Chong-Chen Wang\*  
Beijing University of Civil Engineering and Architecture; Beijing University of Technology



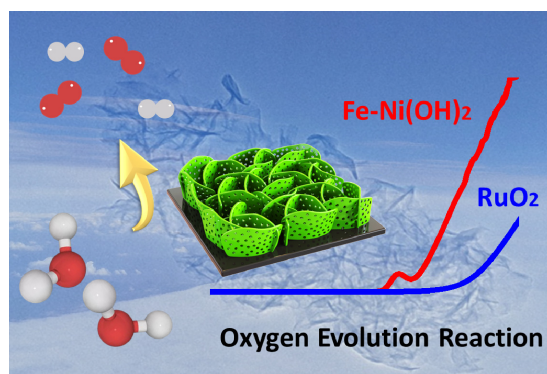
BUC-21/N-K<sub>2</sub>Ti<sub>4</sub>O<sub>9</sub> composites show high photocatalytic activity under UV and white light, which can be used to reduce Cr(VI) to Cr(III) effectively.

*Chin. J. Catal.*, 2021, 42: 271–278 doi: 10.1016/S1872-2067(20)63639-7

### Direct growth of holey Fe<sub>3</sub>O<sub>4</sub>-coupled Ni(OH)<sub>2</sub> sheets on nickel foam for the oxygen evolution reaction

Yu Ding, Bo-Qiang Miao, Yue Zhao, Fu-Min Li, Yu-Cheng Jiang\*,  
Shu-Ni Li\*, Yu Chen  
Shaanxi Normal University

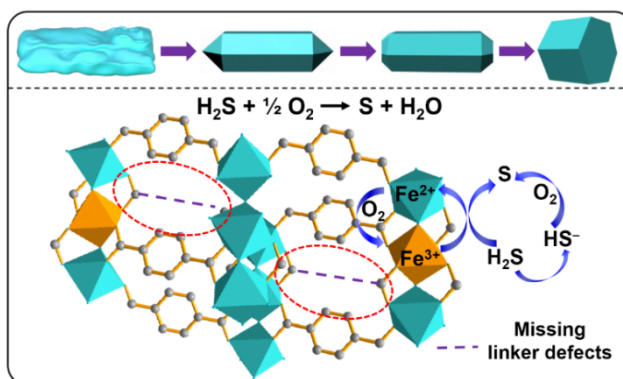
Herein, ultrathin holey Fe<sub>3</sub>O<sub>4</sub>-coupled Ni(OH)<sub>2</sub> sheets (Ni(OH)<sub>2</sub>-Fe H-STs) were easily synthesized, which showed outstanding activity for the OER due to special structural features and synergistic effect between the Fe and Ni atom.



*Chin. J. Catal.*, 2021, 42: 279–287 doi: 10.1016/S1872-2067(20)63625-7

### Morphology evolution of acetic acid-modulated MIL-53(Fe) for efficient selective oxidation of H<sub>2</sub>S

Xiaoxiao Zheng, Sihui Qi, Yanning Cao, Lijuan Shen\*, Chaktong Au, Lilong Jiang\*  
Fuzhou University



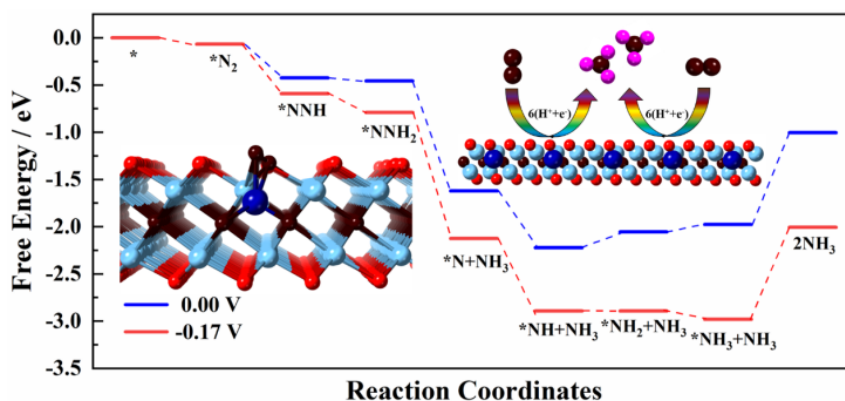
Using acetic acid coordination modulation, a series of MIL-53(Fe) with morphology evolving from irregular bulky particles to highly uniform short hexagonal prisms were synthesized and applied for H<sub>2</sub>S selective oxidation.



*Chin. J. Catal.*, 2021, 42: 288–296 doi: 10.1016/S1872-2067(20)63643-9

### Orbital symmetry matching: Achieving superior nitrogen reduction reaction over single-atom catalysts anchored on Mxene substrates

Jiale Qu, Jiewen Xiao, Hetian Chen, Xiaopeng Liu, Tianshuai Wang, Qianfan Zhang\*  
Beihang University



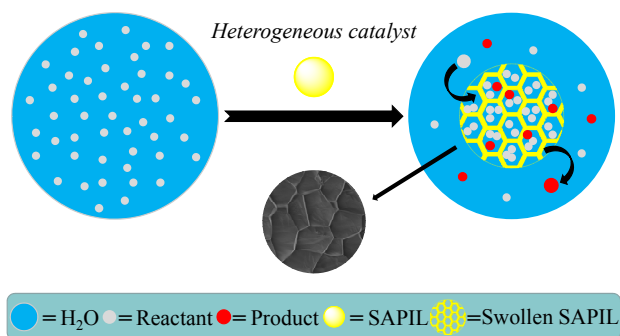
Single atom doped on MXene, which can synergize with the adjacent titanium atom on the matrix. With this synergy, the nitrogen reduction reaction can be proceeded at a low limiting potential.

*Chin. J. Catal.*, 2021, 42: 297–309 doi: 10.1016/S1872-2067(20)63658-0

### Honeycomb-structured solid acid catalysts fabricated via the swelling-induced self-assembly of acidic poly(ionic liquid)s for highly efficient hydrolysis reactions

Bihua Chen, Tong Ding, Xi Deng, Xin Wang, Dawei Zhang,  
Sanguan Ma, Yongya Zhang, Bing Ni, Guohua Gao\*  
East China Normal University, China; University of Cambridge, U.K.

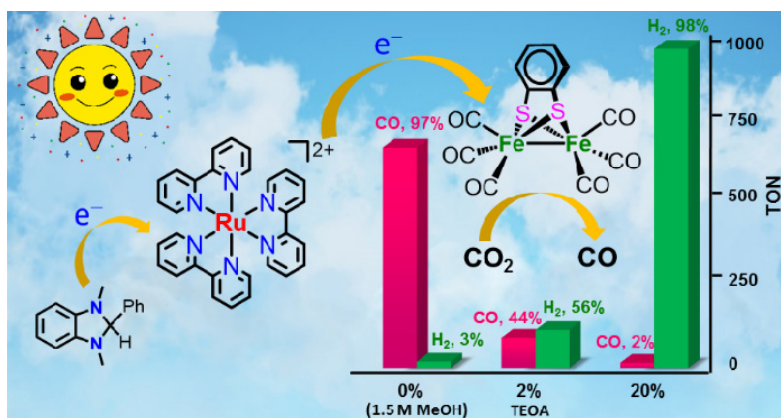
The catalytic activity of SAPILs with micron-sized 3D honeycomb structure in water and high enrichment ability for the reactants of hydrolysis and hydration reactions was much higher than that of homogeneous acid catalysts.



*Chin. J. Catal.*, 2021, 42: 310–319 doi: 10.1016/S1872-2067(20)63644-0

### Selective photocatalytic reduction of CO<sub>2</sub> to CO mediated by a [FeFe]-hydrogenase model with a 1,2-phenylene S-to-S bridge

Minglun Cheng, Xiongfei Zhang, Yong Zhu, Mei Wang\*  
Dalian University of Technology



An [FeFe]-hydrogenase model was demonstrated to be highly active for the photochemical reduction of CO<sub>2</sub> with a TOF of 7.12 min<sup>-1</sup> and CO selectivity of 97%. The CO/H<sub>2</sub> ratio can be adjusted by the addition of TEOA.

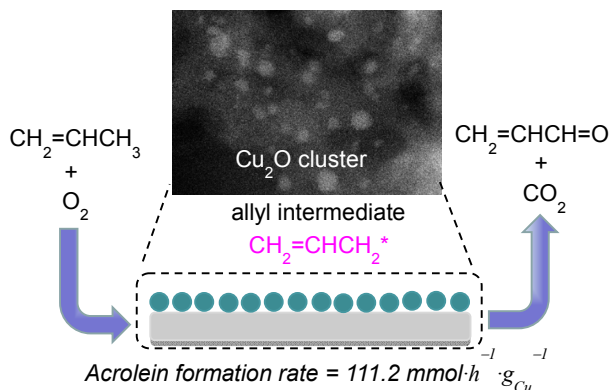


*Chin. J. Catal.*, 2021, 42: 320–333 doi: 10.1016/S1872-2067(20)63636-1

### Small-sized cuprous oxide species on silica boost acrolein formation via selective oxidation of propylene

Ling-Ling Guo, Jing Yu, Wei-Wei Wang, Jia-Xu Liu \*, Hong-Chen Guo, Chao Ma \*, Chun-Jiang Jia \*, Jun-Xiang Chen, Rui Si \*  
*Shanghai Institute of Applied Physics, Chinese Academy of Sciences; Shanghai Synchrotron Radiation Facility, Zhangjiang Laboratory; Shanghai Institute of Measurement and Testing Technology; Shandong University; Dalian University of Technology; Hunan University; TILON Group Technology Limited; University of Chinese Academy of Science*

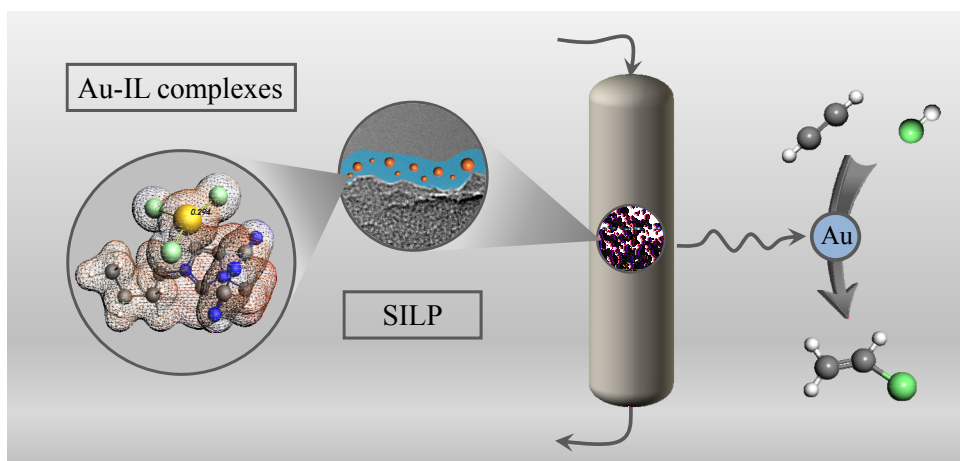
Small-sized copper oxide clusters have been fabricated on silica for the efficient formation of acrolein via the selective oxidation of propylene. The reaction mechanism was explored using *in situ* X-ray diffraction and *in situ* dual beam Fourier transform infrared spectroscopy.



*Chin. J. Catal.*, 2021, 42: 334–346 doi: 10.1016/S1872-2067(20)63617-8

### Acetylene hydrochlorination over supported ionic liquid phase (SILP) gold-based catalyst: Stabilization of cationic Au species via chemical activation of hydrogen chloride and corresponding mechanisms

Jia Zhao \*, Saisai Wang, Bolin Wang, Yuxue Yue, Chunxiao Jin, Jinyue Lu, Zheng Fang, Xiangxue Pang, Feng Feng, Lingling Guo, Zhiyan Pan, Xiaonian Li \*  
*Zhejiang University of Technology*



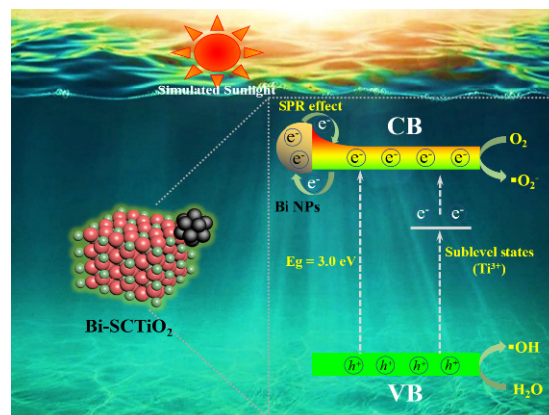
Cationic Au species coordinate with  $[\text{Bmim}][\text{N}(\text{CN})_2]$  to form strong Au-IL complexes, which greatly increase the thermal and reaction stability of Au-based catalysts.

*Chin. J. Catal.*, 2021, 42: 347–355 doi: 10.1016/S1872-2067(20)63668-3

### Complete removal of phenolic contaminants from bismuth-modified $\text{TiO}_2$ single-crystal photocatalysts

Wenjie Tang, Juanrong Chen, Zhengliang Yin, Weichen Sheng \*, Fengjian Lin, Hui Xu, Shunsheng Cao \*  
*Jiangsu University*

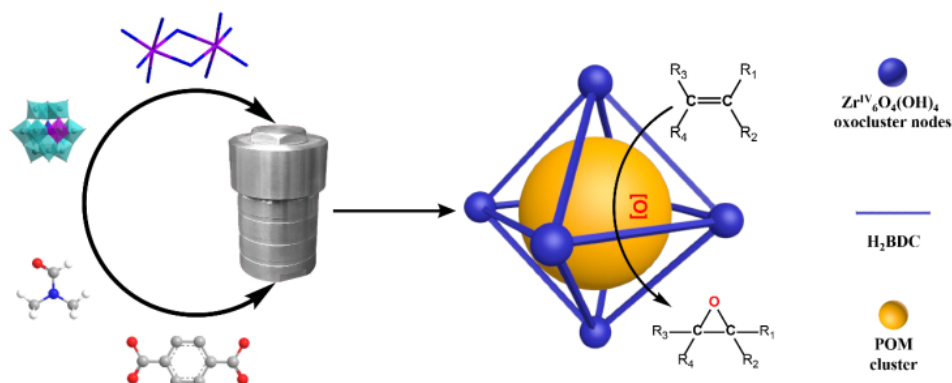
The Bi-SCTiO<sub>2</sub> photocatalyst exhibits complete degradation of phenolic contaminants under simulated sunlight due to the synergistic effect of the small band overlap and the low charge carrier density (Bi) as well as high conductivity (single crystal).



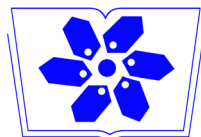
*Chin. J. Catal.*, 2021, 42: 356–366 doi: 10.1016/S1872-2067(20)63665-8

# Solvothermal synthesis of Co-substituted phosphomolybdate acid encapsulated in the UiO-66 framework for catalytic application in olefin epoxidation

Dianwen Hu, Xiaojing Song, Shujie Wu, Xiaotong Yang, Hao Zhang, Xinyu Chang, Mingjun Jia \*  
Jilin University



Hybrid composites based on Co-substituted phosphomolybdic acid (PMo<sub>11</sub>Co) and UiO-66 were synthesized by the direct solvothermal method. PMo<sub>11</sub>Co@UiO-66 showed high catalytic activity and stability for the epoxidation of a variety of olefins with *t*-BuOOH as the oxidant.



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