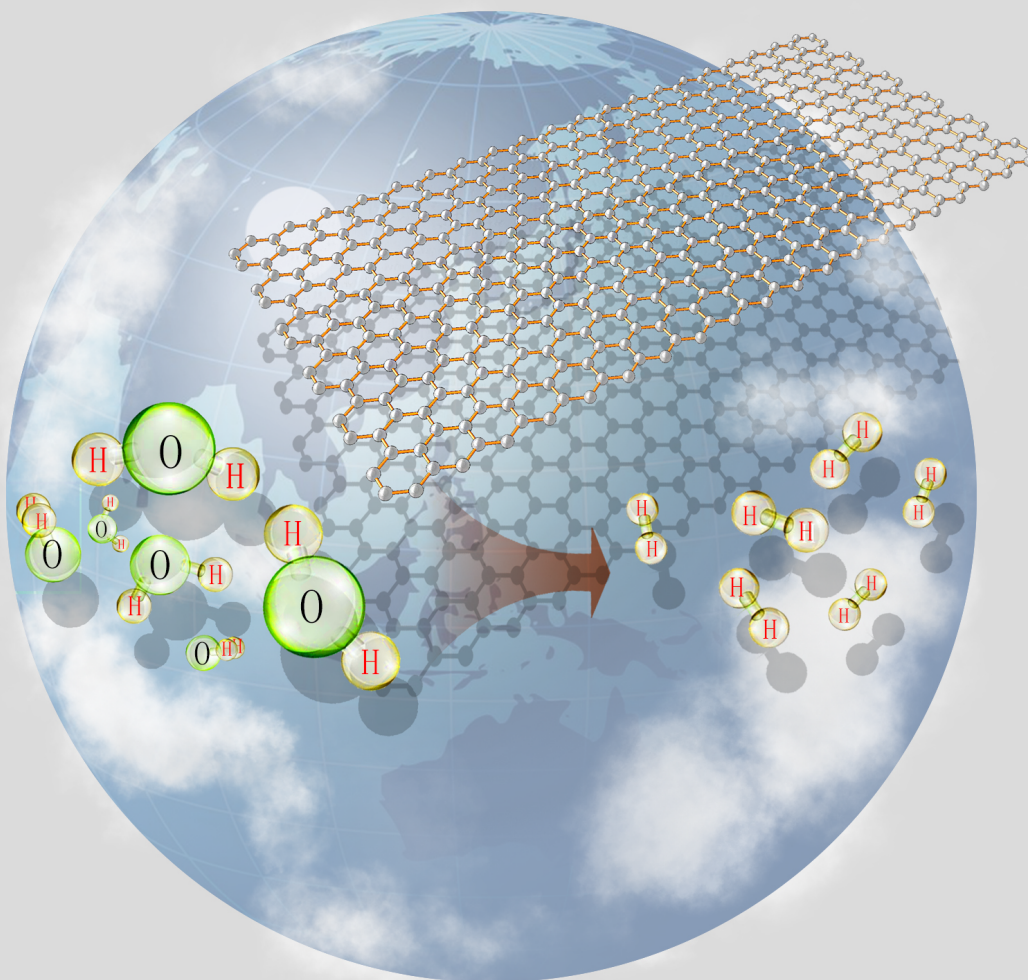




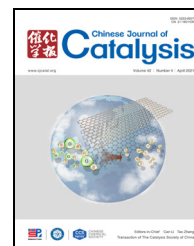
# Chinese Journal of Catalysis

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## Chinese Journal of Catalysis

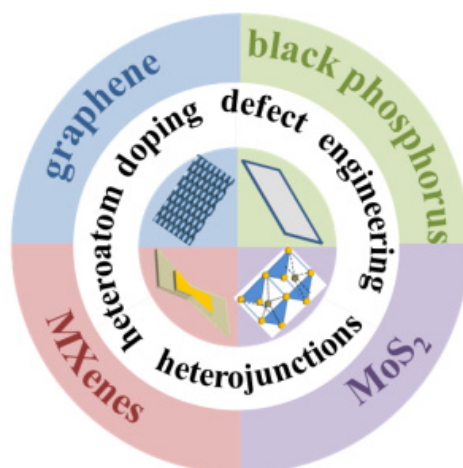
### Graphical Contents

#### Review

*Chin. J. Catal.*, 2021, 42: 511–556 doi: 10.1016/S1872-2067(20)63693-2

#### Strategies to improve electrocatalytic and photocatalytic performance of two-dimensional materials for hydrogen evolution reaction

Saisai Li, Jianrui Sun\*, Jingqi Guan\*  
*Changchun University of Technology; Jilin University*



In this review, we summarize three efficient strategies (defect engineering, heterostructure formation, and heteroatom doping) to improve the HER performance of 2D catalysts.

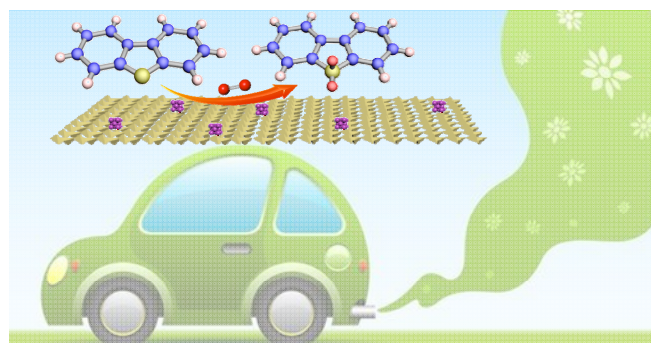
#### Communication

*Chin. J. Catal.*, 2021, 42: 557–562 doi: 10.1016/S1872-2067(20)63685-3

#### Pt nanoparticles encapsulated on V<sub>2</sub>O<sub>5</sub> nanosheets carriers as efficient catalysts for promoted aerobic oxidative desulfurization performance

Chao Wang, Wei Jiang, Hanxiang Chen, Linhua Zhu, Jing Luo, Wenshu Yang, Guangying Chen, Zhigang Chen\*, Wenshuai Zhu\*, Huaming Li  
*Jiangsu University; Hainan Normal University*

Pt NPs with particle sizes of approximately 4–5 nm can be encapsulated effectively and uniformly on the surface of V<sub>2</sub>O<sub>5</sub> nanosheets (with thickness of approximately six atomic layers) as promising catalysts for promoted aerobic oxidative desulfurization performance.



## Articles

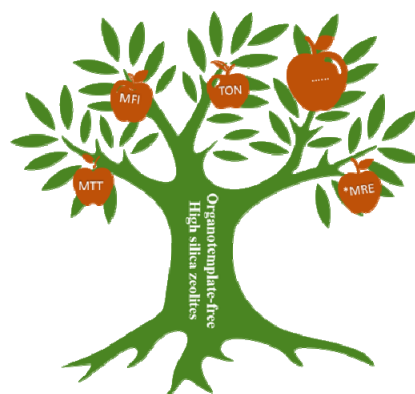
*Chin. J. Catal.*, 2021, 42: 563–570 doi: 10.1016/S1872-2067(20)63677-4

### Alcohol-assisted synthesis of high-silica zeolites in the absence of organic structure-directing agents

Huimin Luan, Chi Lei, Ye Ma, Qiming Wu\*, Longfeng Zhu, Hao Xu, Shichao Han, Qiuyan Zhu, Xiaolong Liu\*, Xiangju Meng, Feng-Shou Xiao\*

*Zhejiang University; Jiaxing University; Sun Yat-Sen University*

High-silica zeolites with MFI, TON, MTT, and \*MRE structures were successfully synthesized using aluminosilicate precursors as the starting sources in the presence of alcohol and zeolite seeds, where the alcohol and seeds were critical for filling and directing, respectively.

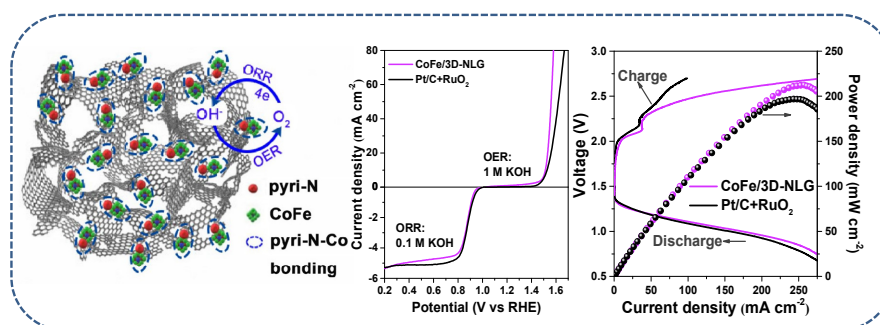


*Chin. J. Catal.*, 2021, 42: 571–582 doi: 10.1016/S1872-2067(20)63642-7

### 3D hierarchically macro-/mesoporous graphene frameworks enriched with pyridinic-nitrogen-cobalt active sites as efficient reversible oxygen electrocatalysts for rechargeable zinc-air batteries

Sheng Zhou, Jiayi Qin, Xueru Zhao, Jing Yang\*

*Tianjin University*



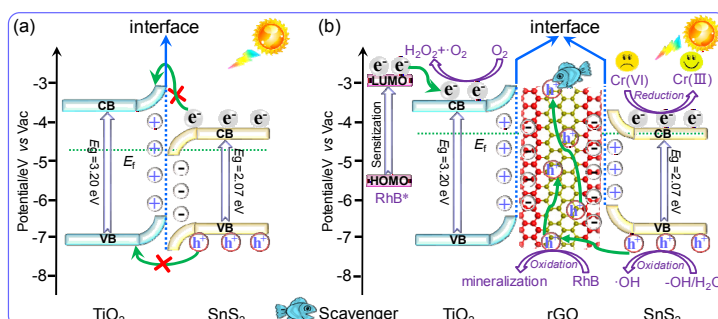
An efficient reversible oxygen electrocatalyst consisting of 3D hierarchically macro-/mesoporous graphene frameworks with abundant pyridinic-nitrogen-cobalt active sites is prepared. It exhibits low overpotentials for both ORR and OER and excellent performance in Zn-air batteries.

*Chin. J. Catal.*, 2021, 42: 583–594 doi: 10.1016/S1872-2067(20)63649-X

### Accelerating directional charge separation via built-in interfacial electric fields originating from work-function differences

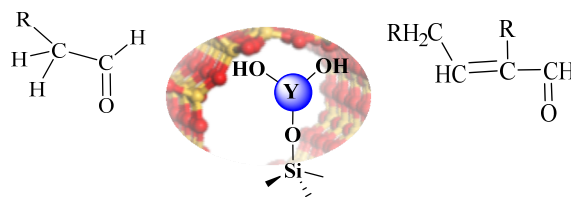
Chao Xue, Hua An, Guosheng Shao, Guidong Yang\*

*Zhengzhou University; Xi'an Jiaotong University*



The built-in interfacial electric fields originating from differences in the work-functions facilitate the directional migration of photo-induced holes from the VB of SnS<sub>2</sub> to the rGO hole injection interlayer, leading to efficient charge separation and high photocatalytic activity.

Chin. J. Catal., 2021, 42: 595–605 doi: 10.1016/S1872-2067(20)63675-0

**Self-aldol condensation of aldehydes over Lewis acidic rare-earth cations stabilized by zeolites**Tingting Yan, Sikai Yao, Weili Dai\*, Guangjun Wu, Naijia Guan, Landong Li\*  
Nankai University

Rare-earth cations stabilized by zeolites are robust Lewis acid catalysts for the self-aldol condensation of aldehydes and the hydroxyl groups at the open sites significantly reduce the energy barrier.

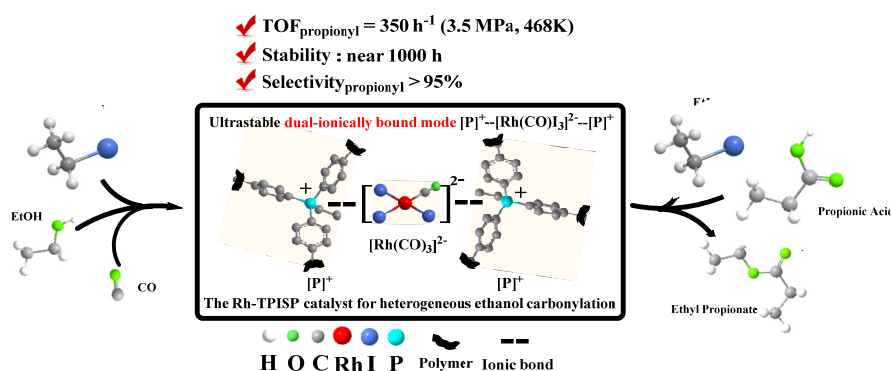
**Self-aldol condensation**

Chin. J. Catal., 2021, 42: 606–617 doi: 10.1016/S1872-2067(20)63676-2

**Quaternary phosphonium polymer-supported dual-ionically bound  $[\text{Rh}(\text{CO})_3]^{2-}$  catalyst for heterogeneous ethanol carbonylation**

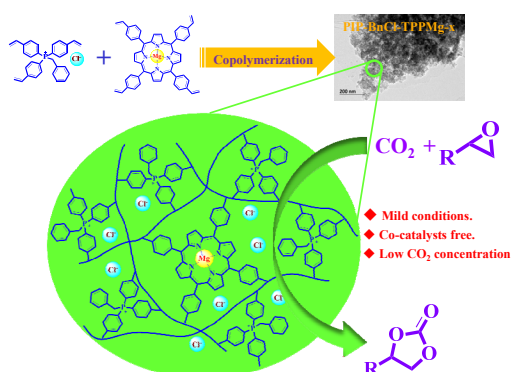
Zhou Ren, Yang Liu, Yuan Lyu\*, Xiangen Song, Changyong Zheng, Zheng Jiang\*, Yunjie Ding\*

Dalian Institute of Chemical Physics, Chinese Academy of Sciences; Shanghai Institute of Applied Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences



The higher electron density of the Rh center in  $[\text{Rh}(\text{CO})_3]^{2-}$  and the ultrastable dual-ionically bound mode of  $[\text{P}]^+ \cdots [\text{Rh}(\text{CO})_3]^{2-} \cdots [\text{P}]^+$  result in excellent activity and stability of Rh-TPISP for heterogeneous ethanol carbonylation.

Chin. J. Catal., 2021, 42: 618–626 doi: 10.1016/S1872-2067(20)63679-8

**Combination of binary active sites into heterogeneous porous polymer catalysts for efficient transformation of  $\text{CO}_2$  under mild conditions**Zhifeng Dai, Yongquan Tang, Fei Zhang, Yubing Xiong\*, Sai Wang, Qi Sun, Liang Wang, Xiangju Meng, Leihong Zhao\*, Feng-Shou Xiao\*  
Zhejiang Sci-Tech University; Zhejiang University; Jiangxi Normal University; Zhejiang Normal University

Heterogeneous catalysts integrating binary active sites are constructed via a facile radical copolymerization method. The catalysts can simultaneously capture and convert  $\text{CO}_2$  into value-added products under very mild and environmentally friendly conditions.

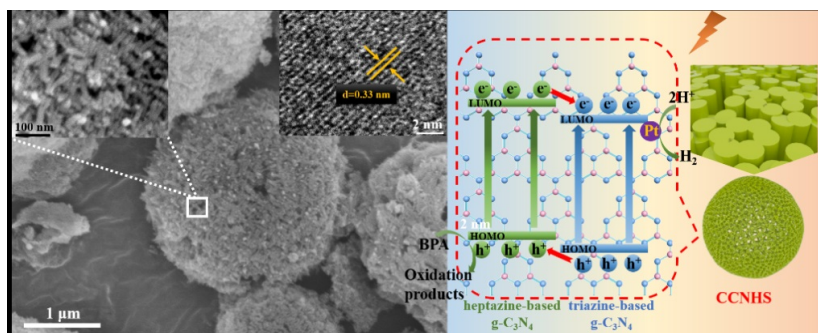


*Chin. J. Catal.*, 2021, 42: 627–636 doi: 10.1016/S1872-2067(20)63684-1

### Highly crystalline carbon nitride hollow spheres with enhanced photocatalytic performance

Yang Li, Dainan Zhang, Jiajie Fan, Qunjun Xiang\*

University of Electronic Science and Technology of China; Huazhong Agricultural University; Zhengzhou University



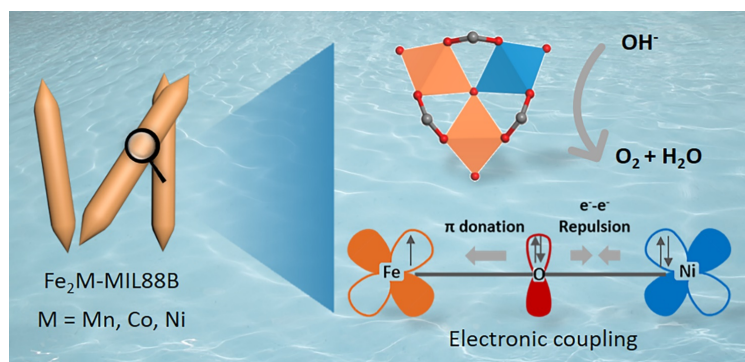
Highly crystalline g-C<sub>3</sub>N<sub>4</sub> hollow spheres, prepared by using cyanuric acid-melamine as a precursor in the molten salt method, exhibited enhanced photocatalytic hydrogen evolution with the simultaneous degradation of plasticizer Bisphenol A.

*Chin. J. Catal.*, 2021, 42: 637–647 doi: 10.1016/S1872-2067(20)63686-5

### Iron-based binary metal–organic framework nanorods as an efficient catalyst for the oxygen evolution reaction

Chuchu Wu, Xiaoming Zhang, Huanqiao Li, Zhangxun Xia, Shansheng Yu, Suli Wang\*, Gongquan Sun\*

Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Jilin University



The electronic coupling effect induced by the introduction of a second metal into iron-based MOFs significantly enhances their electrocatalytic performance toward the oxygen evolution reaction.

*Chin. J. Catal.*, 2021, 42: 648–657 doi: 10.1016/S1872-2067(20)63680-4

### Hierarchically skeletal multi-layered Pt-Ni nanocrystals for highly efficient oxygen reduction and methanol oxidation reactions

Shibo Li, Zhi Qun Tian, Yang Liu, Zheng Jang, Syed Waqar Hasan, Xingfa Chen, Panagiotis Tsiakaras\*, Pei Kang Shen\*

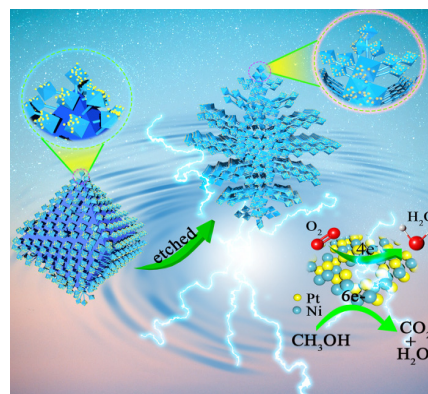
Guangxi University, China;

Institute of High Temperature Electrochemistry, Russia;

Ural Federal University, Russia;

University of Thessaly, Greece

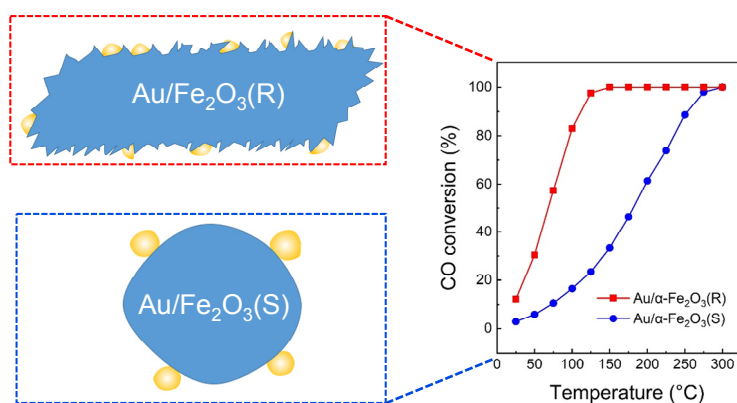
The Pt-Ni catalyst presents a hierarchically skeletal nanostructure upon etching, which provides a large specific surface area of the Pt {111} facet. The well-defined self-supported structure exhibits enhanced activity towards ORR and MOR in acidic media.



*Chin. J. Catal.*, 2021, 42: 658–665 doi: 10.1016/S1872-2067(20)63687-7

### Influence of hematite morphology on the CO oxidation performance of Au/ $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>

Yanan Gao, Fu-Kuo Chiang, Shaojie Li, Long Zhang, Peng Wang, Emiel J. M. Hensen \*  
Eindhoven University of Technology, The Netherlands; National Institute of Clean-and-Low-Carbon Energy, China



The hematite morphology has a substantial influence on the interaction with nanoparticulate gold. Smaller and more sintering-resistant gold particles with hemispherical shape are obtained on rod-shaped Au/Fe<sub>2</sub>O<sub>3</sub>(R), displaying significantly higher CO oxidation activity in comparison to sphere-shaped Au/Fe<sub>2</sub>O<sub>3</sub>(S).



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## 目次

### 综述

511

提升二维材料的电催化析氢和光催化析氢性能的策略  
李赛赛, 孙见蕊, 管景奇

### 快讯

557

V<sub>2</sub>O<sub>5</sub>纳米片固载Pt纳米粒子催化剂的构建及其增强催化空气氧化脱硫性能  
王超, 蒋伟, 陈瀚翔, 朱林华, 罗静, 杨文书, 陈光英, 陈志刚, 朱文帅, 李华明

### 论文

563

在无有机导向剂条件下采用乙醇为助剂合成高硅沸石  
栾慧敏, 雷驰, 马野, 吴勤明, 朱龙凤, 徐好, 韩世超, 朱秋艳, 刘小龙, 孟祥举, 肖丰收

571

富含吡啶氮-钴活性位点的三维多级大/介孔石墨烯作为高效可逆氧电催化剂用于可充电锌-空气电池  
周省, 覃佳艺, 赵雪茹, 杨静

583

源于功函数差异的界面内建电场调控载流子定向分离的作用机制研究  
薛超, 安华, 邵国胜, 杨贵东

595

分子筛稳定的Lewis酸稀土中心在醛自缩合反应中的应用  
颜婷婷, 姚思凯, 戴卫理, 武光军, 关乃佳, 李兰冬

606

通过“双离子键”固载于季磷盐聚合物的[Rh(CO)<sub>3</sub>]物种在多相乙醇羰基化中的应用  
任周, 刘洋, 吕元, 宋宪根, 郑长勇, 姜政, 丁云杰

618

双中心多孔聚合物作为多相催化剂实现CO<sub>2</sub>在温和条件下高效转化  
戴志锋, 唐永铨, 张飞, 熊玉兵, 王赛, 孙琦, 王亮, 孟祥举, 赵雷洪, 肖丰收

627

高结晶氮化碳空心球的制备及其增强光催化产氢活性  
李阳, 张岱南, 范佳杰, 向全军

637

具有高效析氧催化性能的铁基双元金属有机框架纳米棒研究  
吴楚楚, 张晓明, 李焕巧, 夏章讯, 于陝升, 王素力, 孙公权

648

分级骨架和多层的Pt-Ni纳米晶体用于高效氧还原和甲醇氧化反应  
李石波, 田植群, 刘洋, 蒋政, 哈森, 陈兴发, 帕纳斯, 沈培康

658

$\alpha$ -Fe<sub>2</sub>O<sub>3</sub>形貌对Au/ $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>催化一氧化碳氧化反应性能的影响  
Yanan Gao, Fu-Kuo Chiang, Shaojie Li, Long Zhang, Peng Wang, Emiel J. M. Hensen

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