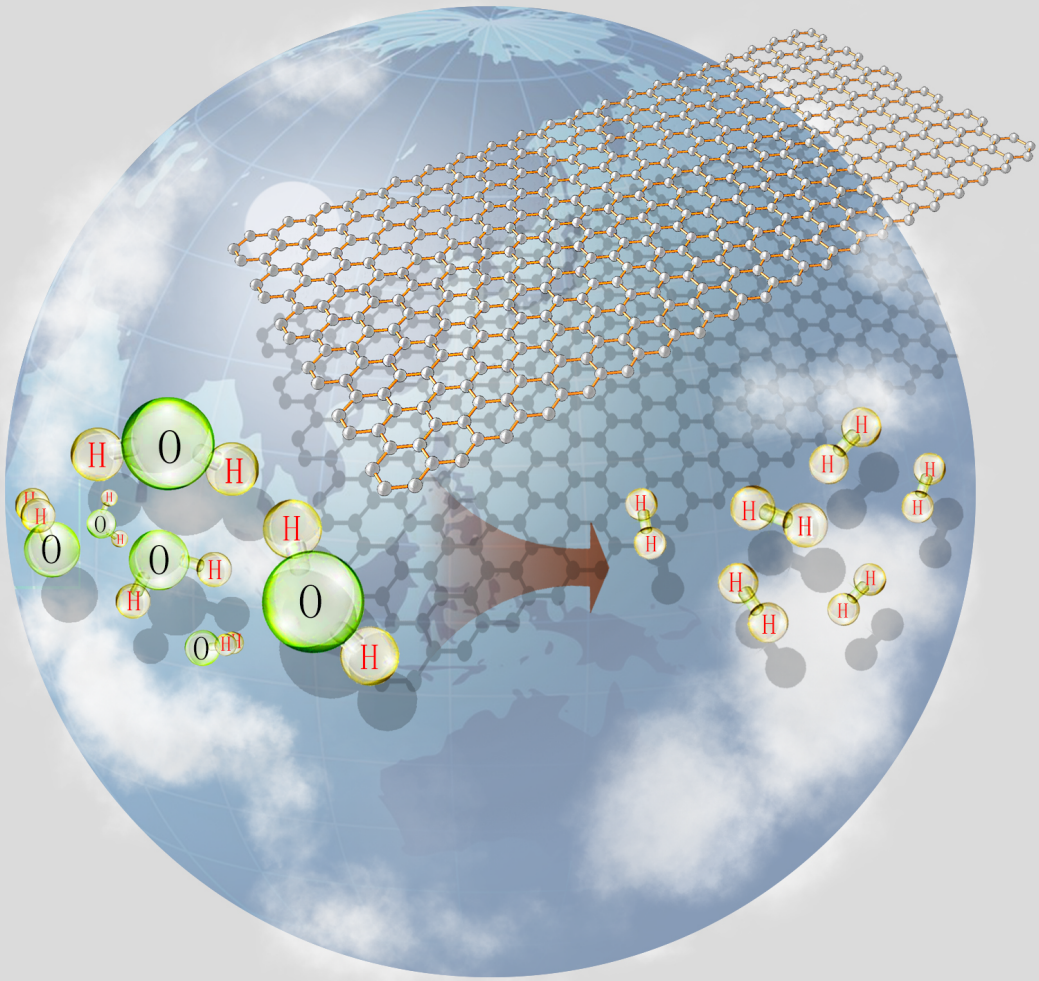
ISSN 0253-9837
CN 21-1601/O6

催化学报 Chinese Journal of Catalysis

www.cjcatal.org

Volume 42 | Number 4 | April 2021



催化学报 CHINESE JOURNAL OF CATALYSIS April 2021 Vol. 42 No. 4 Pages 511–666

Science Press

CCS 中国化学会 CHINESE CHEMICAL SOCIETY

Editors-in-Chief Can Li Tao Zhang

Transaction of The Catalysis Society of China

科学出版社

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Chinese Journal of Catalysis

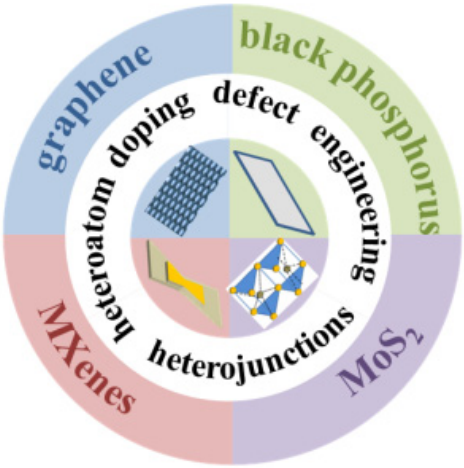
Graphical Contents

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



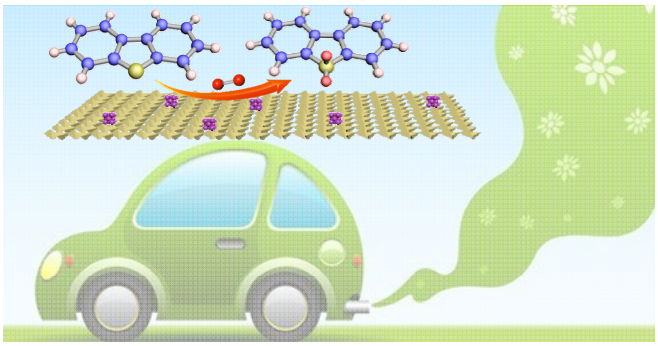
In this review, we summarize three efficient strategies (defect engineering, heterostructure formation, and heteroatom doping) to improve the HER performance of 2D catalysts.

Communication

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

Pt nanoparticles encapsulated on V_2O_5 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



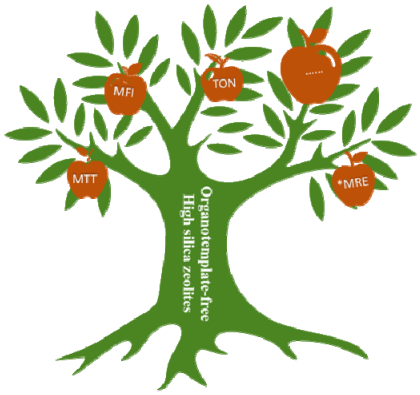
Pt NPs with particle sizes of approximately 4–5 nm can be encapsulated effectively and uniformly on the surface of V_2O_5 nanosheets (with thickness of approximately six atomic layers) as promising catalysts for promoted aerobic oxidative desulfurization performance.

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, Qinming Wu *, Longfeng Zhu, Hao Xu, Shichao Han, Qiuyan Zhu, Xiaolong Liu *, Xiangju Meng, Feng-Shou Xiao *
Zhejiang University; Jiaxing University; Sun Yat-Sen University

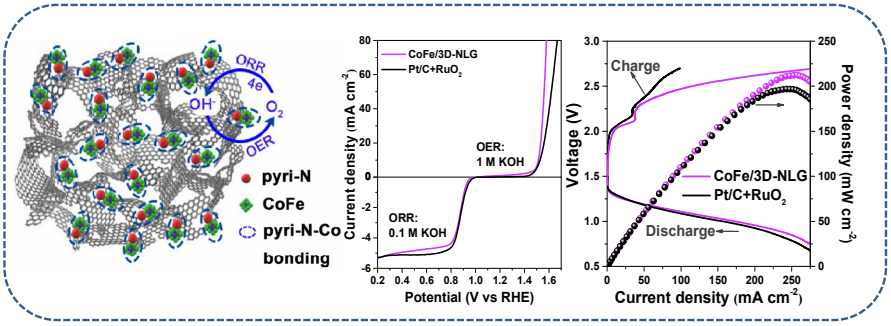


High-silica zeolites with MFI, TON, MTT, and *MRE structures were successfully synthesized using aluminosilicate precursors as the starting sources in the presence of alcohol and zeolite seeds, where the alcohol and seeds were critical for filling and directing, respectively.

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

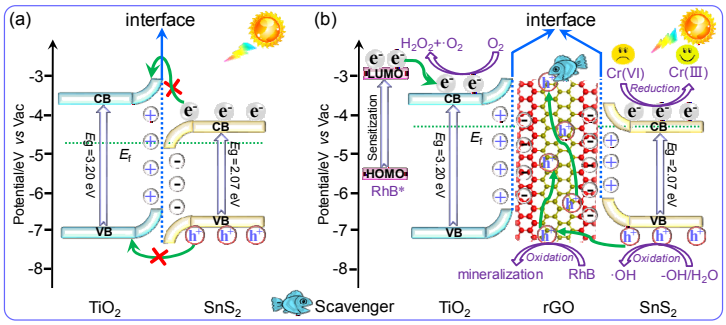


An efficient reversible oxygen electrocatalyst consisting of 3D hierarchically macro-/mesoporous graphene frameworks with abundant pyridinic-nitrogen-cobalt active sites is prepared. It exhibits low overpotentials for both ORR and OER and excellent performance in Zn-air batteries.

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

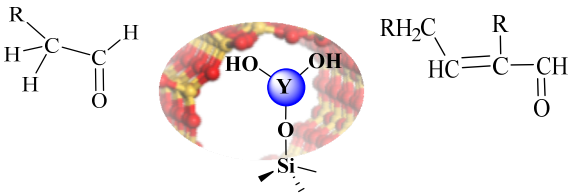


The built-in interfacial electric fields originating from differences in the work-functions facilitate the directional migration of photo-induced holes from the VB of SnS_2 to the rGO hole injection interlayer, leading to efficient charge separation and high photocatalytic activity.

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

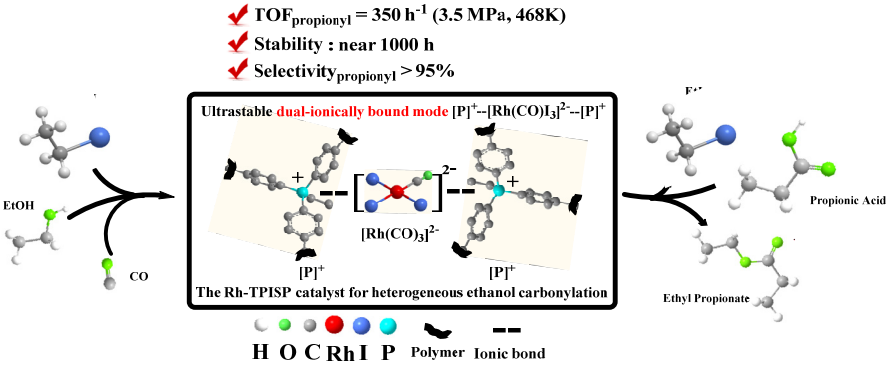


Rare-earth cations stabilized by zeolites are robust Lewis acid catalysts for the self-aldol condensation of aldehydes and the hydroxyl groups at the open sites significantly reduce the energy barrier.

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

Quaternary phosphonium polymer-supported dual-ionically bound $[Rh(CO)I_3]^{2-}$ 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

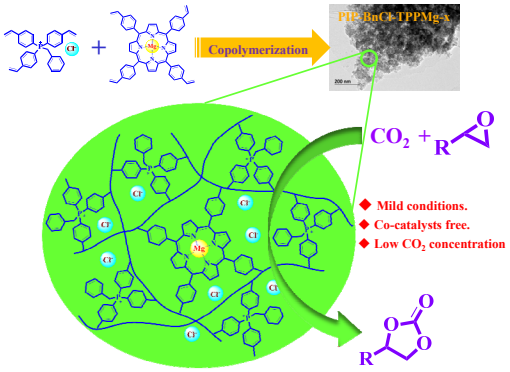


The higher electron density of the Rh center in $[Rh(CO)I_3]^{2-}$ and the ultrastable dual-ionically bound mode of $[P]^+$--$[Rh(CO)I_3]^{2-}$--$[P]^+$ result in excellent activity and stability of Rh-TPISP for heterogeneous ethanol carbonylation.

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 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

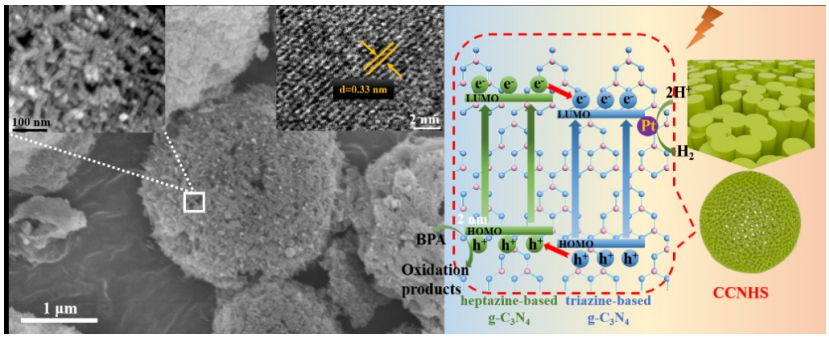


Heterogeneous catalysts integrating binary active sites are constructed via a facile radical copolymerization method. The catalysts can simultaneously capture and convert CO_2 into value-added products under very mild and environmentally friendly conditions.

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, Quanjun Xiang *
University of Electronic Science and Technology of China; Huazhong Agricultural University; Zhengzhou University

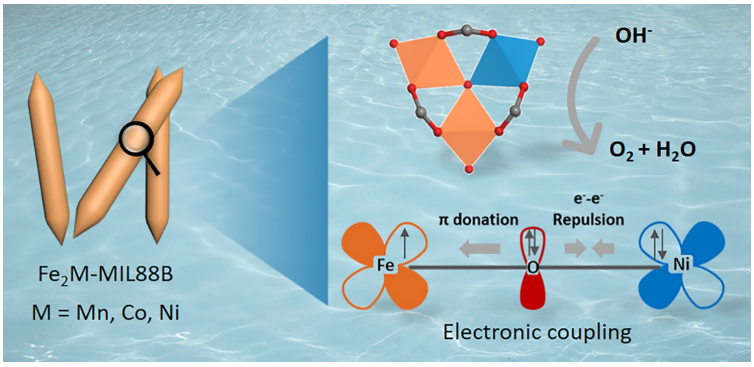


Highly crystalline g-C_3N_4 hollow spheres, prepared by using cyanuric acid-melamine as a precursor in the molten salt method, exhibited enhanced photocatalytic hydrogen evolution with the simultaneous degradation of plasticizer Bisphenol A.

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

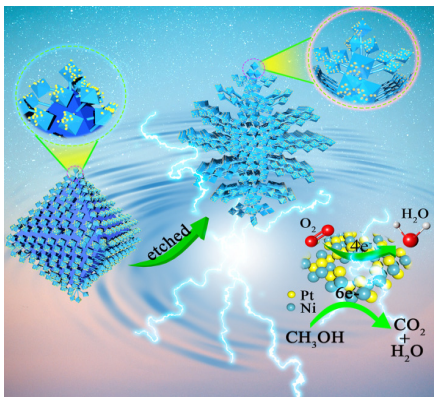


The electronic coupling effect induced by the introduction of a second metal into iron-based MOFs significantly enhances their electrocatalytic performance toward the oxygen evolution reaction.

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

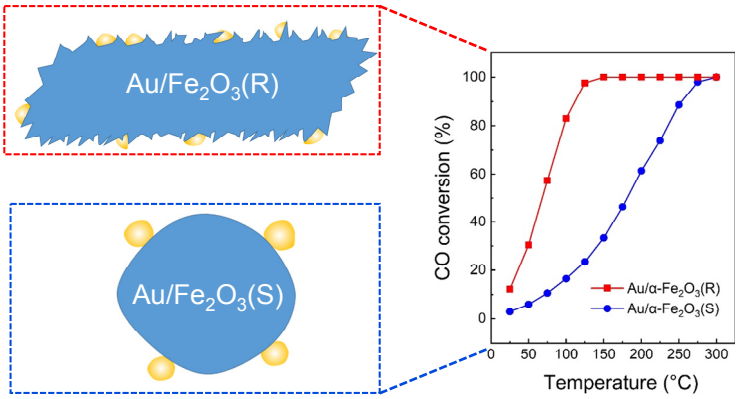


The Pt-Ni catalyst presents a hierarchically skeletal nanostructure upon etching, which provides a large specific surface area of the Pt {111} facet. The well-defined self-supported structure exhibits enhanced activity towards ORR and MOR in acidic media.

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/α-Fe_2O_3

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_2O_3(R), displaying significantly higher CO oxidation activity in comparison to sphere-shaped Au/Fe_2O_3(S).

中国科学院科学出版基金资助出版

催化学报 Chinese Journal of Catalysis

月刊 SCI收录 2021年4月 第42卷 第4期

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