

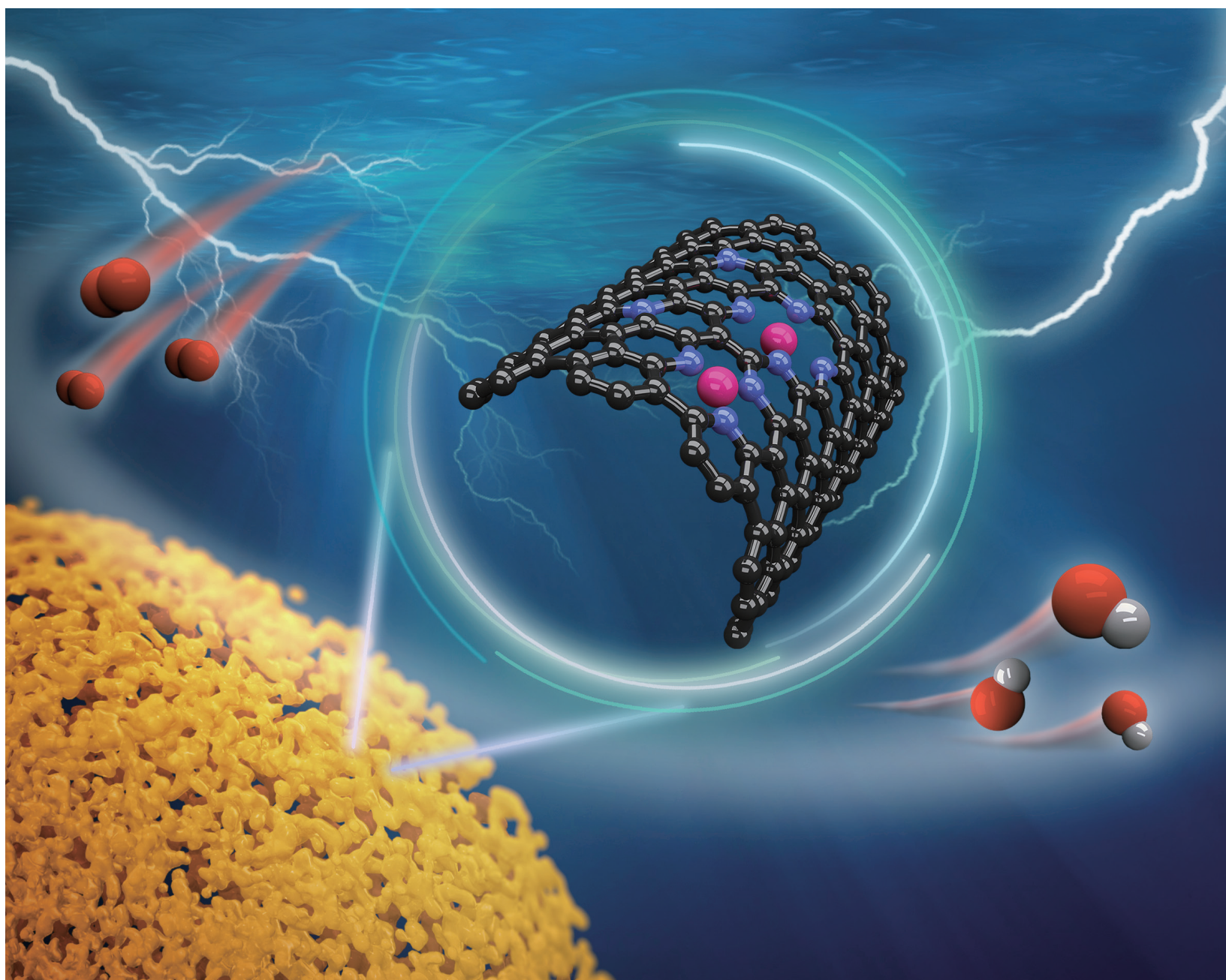
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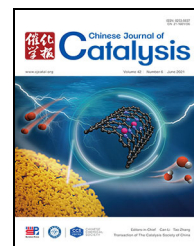
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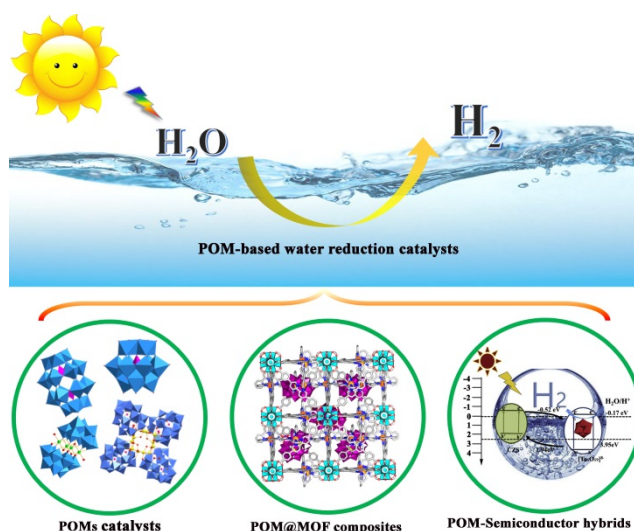
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Reviews

Chin. J. Catal., 2021, 42: 855–871 doi: 10.1016/S1872-2067(20)63714-7

Research advances of light-driven hydrogen evolution using polyoxometalate-based catalysts

Mo Zhang, Huijie Li, Junhao Zhang, Hongjin Lv *, Guo-Yu Yang *
Beijing Institute of Technology

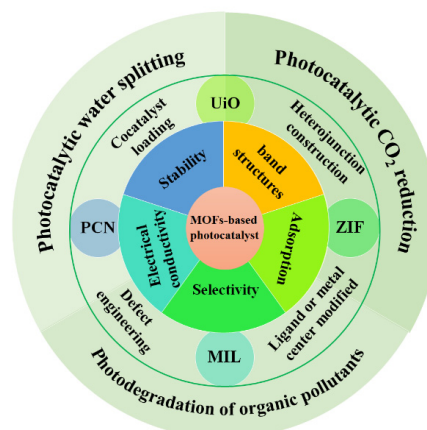


This critical review addresses the research advances of light-driven hydrogen evolution using polyoxometalate-based catalysts (including plenary POMs, transition-metal-substituted POMs, POM@MOF composites, and POM-Semiconductor hybrids) under UV, near UV, and visible light irradiation.

Chin. J. Catal., 2021, 42: 872–903 doi: 10.1016/S1872-2067(20)63715-9

Design of metal-organic frameworks (MOFs)-based photocatalyst for solar fuel production and photo-degradation of pollutants

Xiaoxue Zhao, Jinze Li, Xin Li, Pengwei Huo *, Weidong Shi *
Jiangsu University



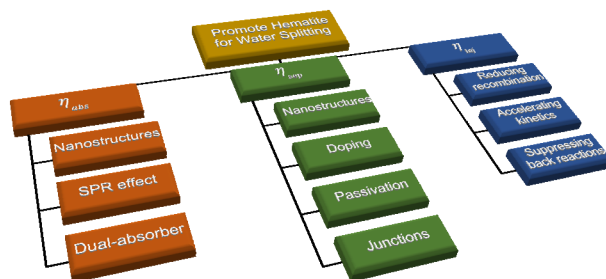
The design factors of MOFs-based photocatalysts and strategies to improve the activity of MOFs-based photocatalysts are discussed, and their application progress and challenges in reducing CO₂, decomposing water and degrading organic pollutants are summarized.

Chin. J. Catal., 2021, 42: 904–919 doi: 10.1016/S1872-2067(20)63712-3

Recent strategies to enhance the efficiency of hematite photoanodes in photoelectrochemical water splitting

Dinghua Zhou, Ke Fan *
Dalian University of Technology

Widely applied strategies to enhance the photoelectrochemical performance of hematite photoanodes for water splitting.

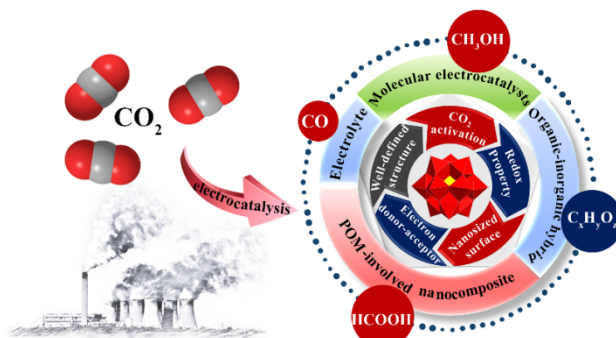


Chin. J. Catal., 2021, 42: 920–937 doi: 10.1016/S1872-2067(20)63718-4

Progress of electrochemical CO₂ reduction reactions over polyoxometalate-based materials

Jing Du, Yuan-Yuan Ma, Huaqiao Tan *, Zhen-Hui Kang *,
Yangguang Li *
Northeast Normal University; Soochow University;
Hebei Normal University

Recent progress in the field of electrochemical CO₂ reduction reactions over polyoxometalate (POM)-based materials have been summarized and critically reviewed, highlighting the activity origin and reaction mechanisms of POM-based materials.



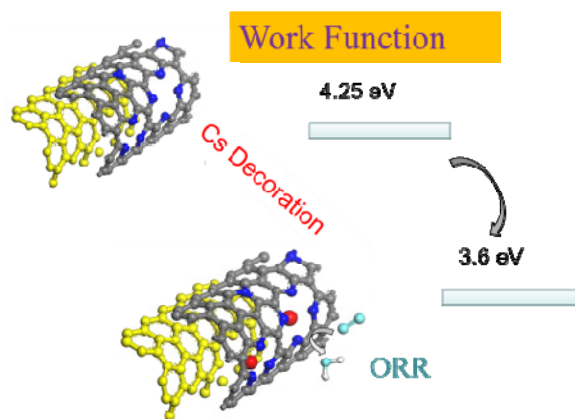
Articles

Chin. J. Catal., 2021, 42: 938–944 doi: 10.1016/S1872-2067(20)63701-9

Regulating carbon work function to boost electrocatalytic activity for the oxygen reduction reaction

Yazhi Cai, Li Tao, Gen Huang, Nana Zhang, Yuqin Zou *,
Shuangyin Wang
Hunan University

The cesium-doping could regulate the work function of N-doped carbon and boost the electrocatalytic activity for the ORR.

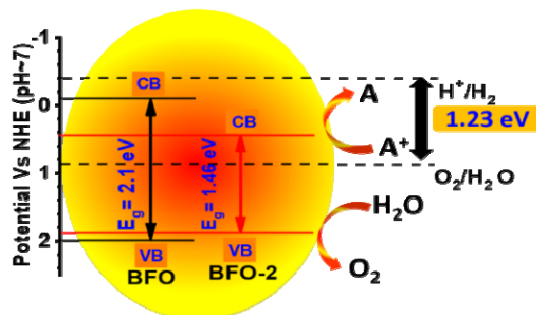


Chin. J. Catal., 2021, 42: 945–952 doi: 10.1016/S1872-2067(20)63713-5

Intrinsic photocatalytic water oxidation activity of Mn-doped ferroelectric BiFeO₃

Jafar Hussain Shah, Anum Shahid Malik, Ahmed Mahmoud Idris,
Saadia Rasheed, Hongxian Han *, Can Li
Dalian Institute of Chemical Physics, Chinese Academy of Sciences;
University of Chinese Academy of Sciences

Mn-doped BiFeO₃ enhances intrinsic photocatalytic OER activity due to synergetic improvement of light absorption and charge separation as well as lowering the water oxidation activation energy.



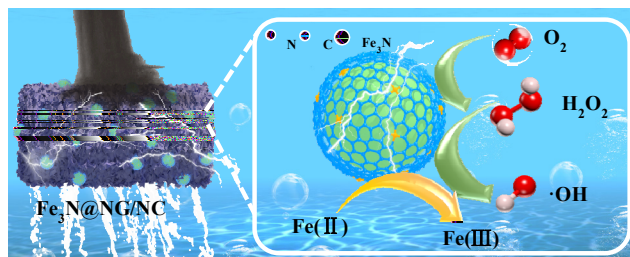
Chin. J. Catal., 2021, 42: 953–962 doi: 10.1016/S1872-2067(20)63719-6

N-doped carbon-coated Fe₃N composite as heterogeneous electro-Fenton catalyst for efficient degradation of organics

Juan Xiao, Junwei Chen, Zuqiao Ou, Junhang Lai, Tongwen Yu, Yi Wang*

Sun Yat-sen University

Iron-based metal organic framework derived Fe₃N/@NG/NC catalyst exhibits outstanding heterogeneous electro-Fenton performance for removing organic pollutants with good reusability and low iron leaching over a wide pH range of 3.0–9.0.



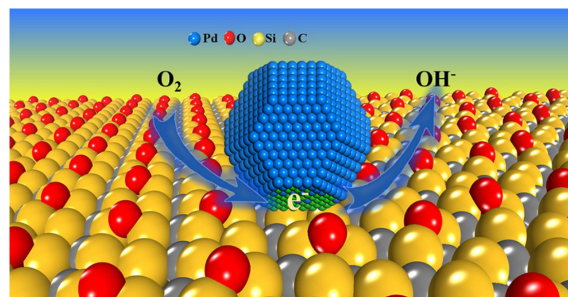
Chin. J. Catal., 2021, 42: 963–970 doi: 10.1016/S1872-2067(20)63716-0

Enhanced oxygen reduction reaction performance over Pd catalysts by oxygen-surface-modified SiC

Jing Li, Xiang Sun, Yongzheng Duan, Dongmei Jia, Yuejin Li, Jianguo Wang*

Binzhou University; Zhejiang University of Technology

Charge transfer from SiC_xO_y on the surface of SiC to Pd NPs enhanced the ORR activity by inducing electron-rich Pd.



Chin. J. Catal., 2021, 42: 971–979 doi: 10.1016/S1872-2067(20)63710-X

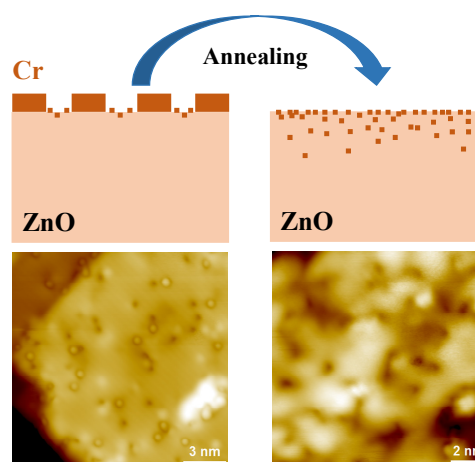
Atomic structures and electronic properties of Cr-doped ZnO(10 $\bar{1}$ 0) surfaces

Wugen Huang, Jun Cai, Jun Hu, Junfa Zhu, Fan Yang*, Xinhe Bao*

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

ShanghaiTech University; University of Science and Technology of China

Cr islands and isolated Cr³⁺ atoms deposited on ZnO(10 $\bar{1}$ 0) at 300 K would re-disperse into ZnO lattice after annealing at above 600 K owing to the strong interaction between Cr and ZnO.



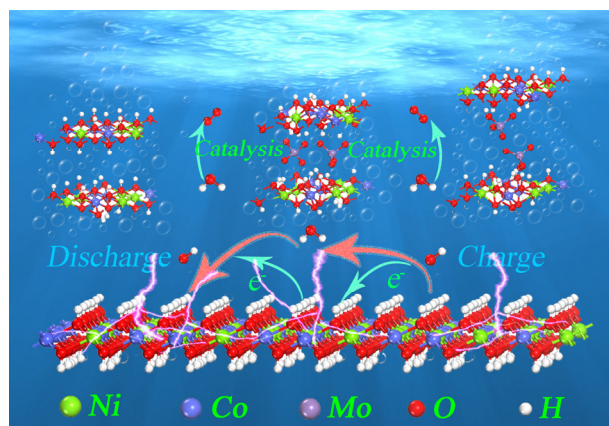
Chin. J. Catal., 2021, 42: 980–993 doi: 10.1016/S1872-2067(20)63724-X

Critical roles of molybdate anions in enhancing capacitive and oxygen evolution behaviors of LDH@PANI nanohybrids

Qiang Hu, Hua Wang, Feifei Xiang, Qiaoqi Zheng, Xinguo Ma, Yu Huo, Fengyu Xie, Chenggang Xu, Dunmin Lin*, Jisong Hu*

Sichuan Normal University; Hubei University of Technology

A polyaniline-coated NiCo layered double hydroxide intercalated with MoO₄²⁻ (M-LDH@PANI) composite electrode is used in high-performance supercapattery and oxygen evolution reactions.

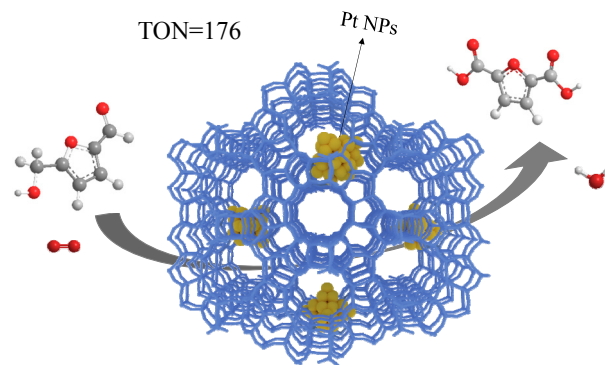


Chin. J. Catal., 2021, 42: 994–1003 doi: 10.1016/S1872-2067(20)63720-2

Straightforward synthesis of beta zeolite encapsulated Pt nanoparticles for the transformation of 5-hydroxymethyl furfural into 2,5-furandicarboxylic acid

Xiaoling Liu, Lei Chen, Hongzhong Xu, Shi Jiang, Yu Zhou *, Jun Wang *
Nanjing Tech University

Beta zeolite-encapsulated Pt NPs provided a high yield and turnover number in the oxidation of HMF into FDCA with atmospheric O₂.

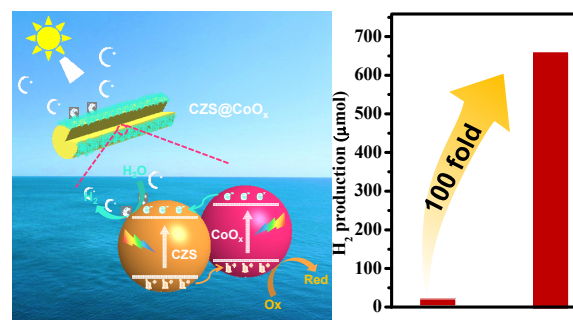


Chin. J. Catal., 2021, 42: 1004–1012 doi: 10.1016/S1872-2067(20)63717-2

Surface assembly of cobalt species for simultaneous acceleration of interfacial charge separation and catalytic reactions on Cd_{0.9}Zn_{0.1}S photocatalyst

Khakemin Khan, Lifan Xu, Ming Shi, Jiangshan Qu, Xiaoping Tao, Zhaochi Feng, Can Li, Rengui Li*
Dalian Institute of Chemical Physics, Chinese Academy of Sciences,
Dalian National Laboratory for Clean Energy;
University of Chinese Academy of Sciences

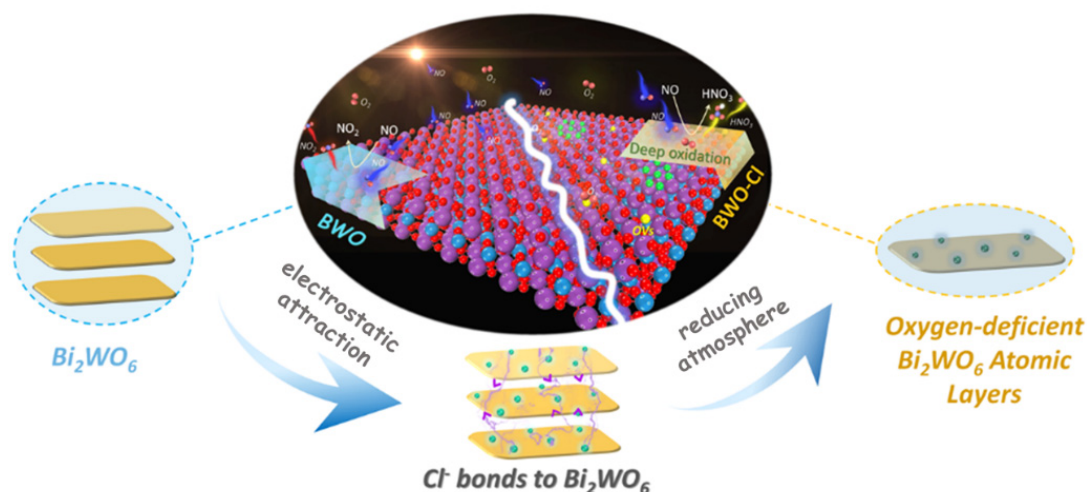
The hierarchical CZS@CoO_x heterostructure, synthesized via surface assembly of CoO_x species on the surface of CZS, exhibits efficient interfacial charge separation and accelerated surface HER activity.



Chin. J. Catal., 2021, 42: 1013–1023 doi: 10.1016/S1872-2067(20)63708-1

Chloridion-induced dual tunable fabrication of oxygen-deficient Bi₂WO₆ atomic layers for deep oxidation of NO

Xianglong Yang, Shengyao Wang, Ting Chen, Nan Yang, Kai Jiang, Pei Wang, Shu Li, Xing Ding *, Hao Chen *
Huazhong Agricultural University



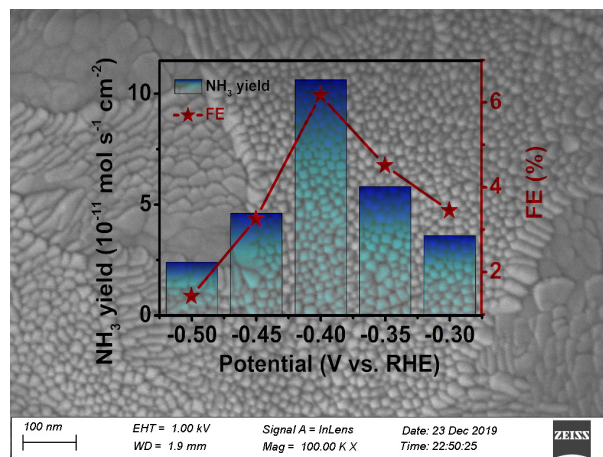
Chloridion plays an indispensable role in the fabrication of oxygen-deficient Bi₂WO₆ atomic layers: ultrathinning and defect-engineering. The as-prepared BWO-Cl displayed intriguing photoelectrochemical properties and O₂ activation ability, thereby exerting ultrahigh activity in the visible-light powered deep oxidation of NO.

Chin. J. Catal., 2021, 42: 1024–1029 doi: 10.1016/S1872-2067(20)63704-4

Commercial indium-tin oxide glass: A catalyst electrode for efficient N₂ reduction at ambient conditions

Ting Wang, Shaoxiong Li, Bingling He, Xiaojuan Zhu, Yonglan Luo*, Qian Liu, Tingshuai Li, Siyu Lu, Chen Ye, Abdullah M. Asiri, Xuping Sun*

China West Normal University, China; Xinxiang University, China; University of Electronic Science and Technology of China, China; Zhengzhou University, China; Sichuan University, China; King Abdulaziz University, Saudi Arabia

Commercial indium-tin oxide glass acts as an efficient electrocatalyst for the conversion of N₂ to NH₃ in 0.5 M LiClO₄, achieving a large NH₃ yield of $1.06 \times 10^{-10} \text{ mol s}^{-1} \text{ cm}^{-2}$ and a high FE of 6.17%.

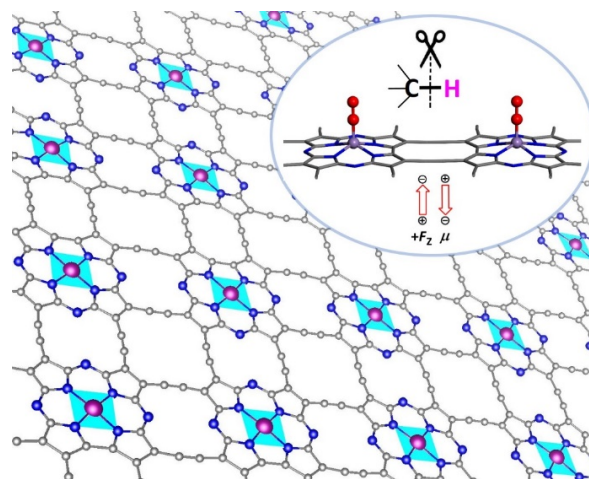
Chin. J. Catal., 2021, 42: 1030–1039 doi: 10.1016/S1872-2067(20)63707-X

Mn-corrolazine-based 2D-nanocatalytic material with single Mn atoms for catalytic oxidation of alkane to alcohol

Chun Zhu, Jin-Xia Liang, Yang Meng, Jian Lin*, Zexing Cao*

Guizhou University; Guizhou Education University; Dalian Institute of Chemical Physics, Chinese Academy of Sciences; Xiamen University

Novel two-dimensional (2D) Mn-corrolazine nanocatalytic materials bearing Mn atoms as single-atom catalyst centers can efficiently and selectively oxidize C-H to C-OH bonds through the regulation of an external electric field.

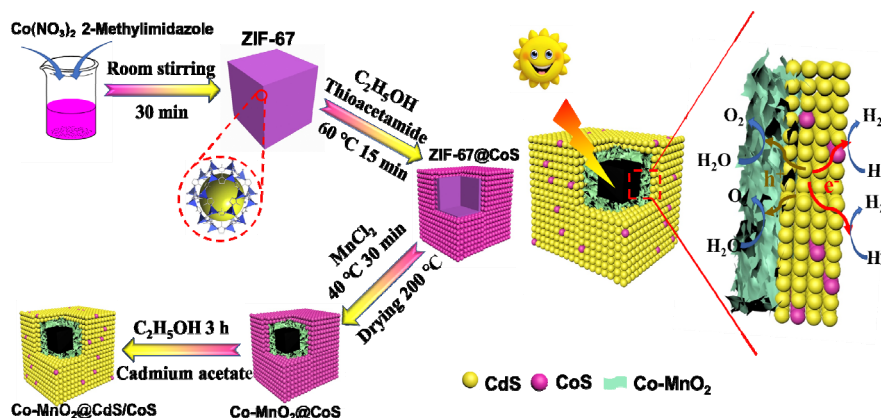


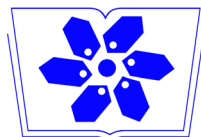
Chin. J. Catal., 2021, 42: 1040–1050 doi: 10.1016/S1872-2067(20)63706-8

Rational design of stratified material with spatially separated catalytic sites as an efficient overall water-splitting photocatalyst

Yi-Lei Li, Xiao-Jing Wang, Ying-Juan Hao, Jun Zhao, Ying Liu, Hui-Ying Mu, Fa-Tang Li*

Hebei University of Science and Technology

Stratified Co-MnO₂@CdS/CoS hollow cubes enable rapid transfer of photoinduced electrons and holes from CdS to the CoS and Co-MnO₂ catalytic sites, respectively, thereby enhancing overall water-splitting performance.



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