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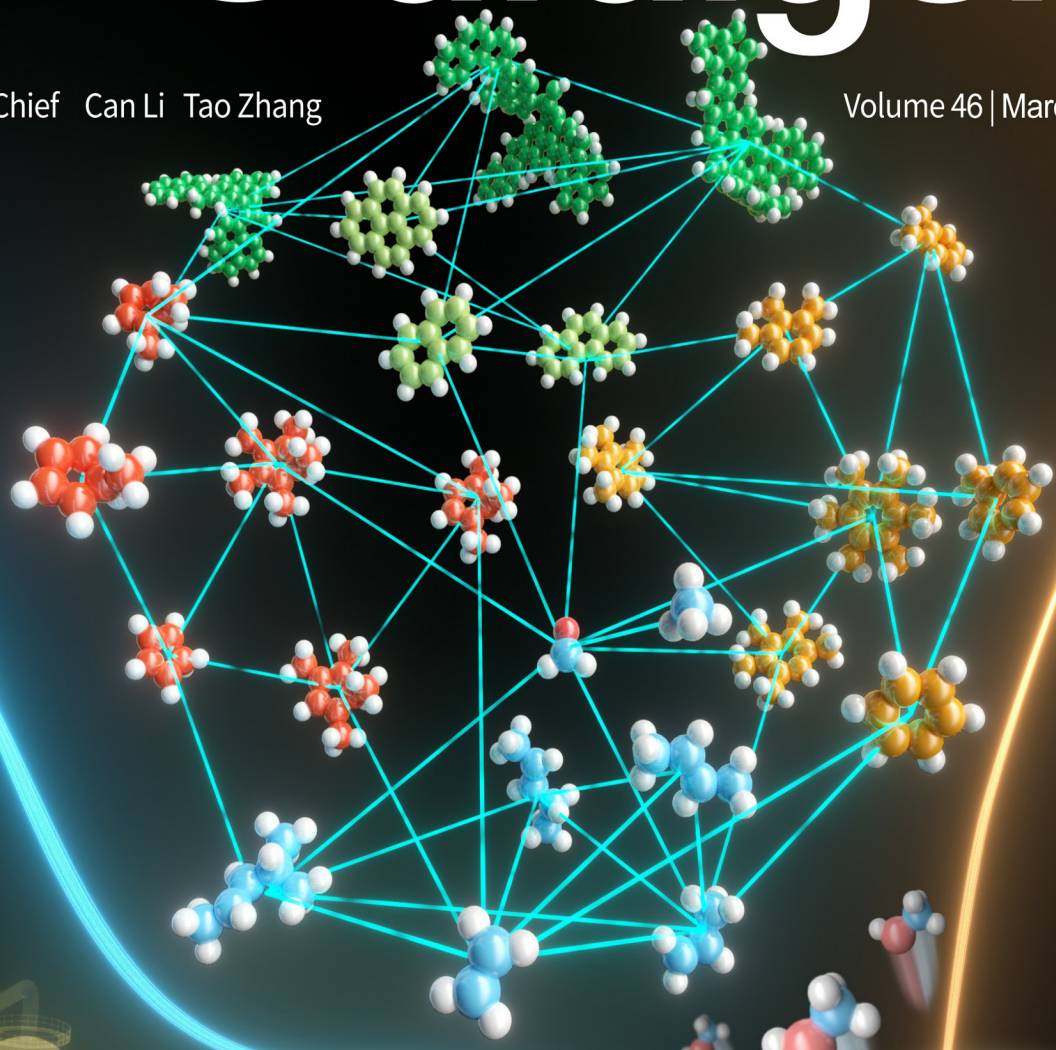

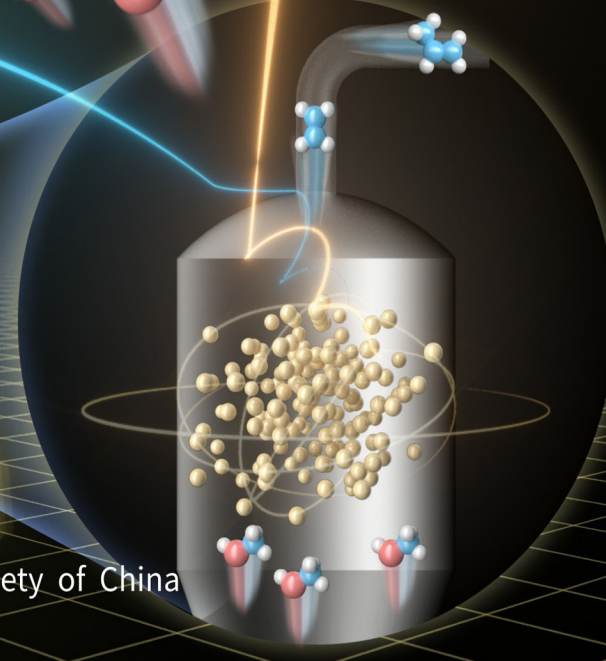

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广告信息

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Chinese Journal of Catalysis

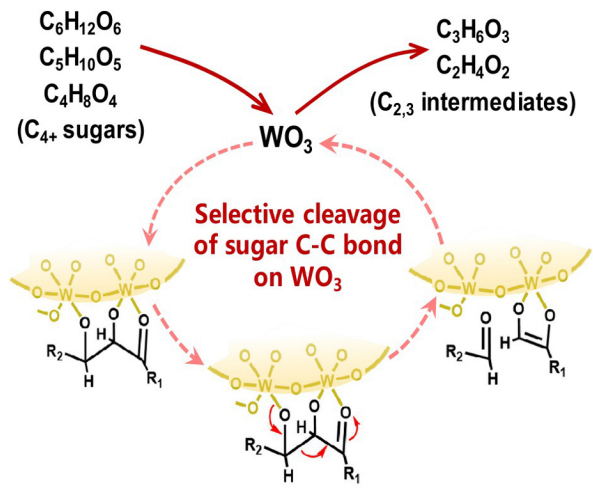
Graphical Contents

Highlight

Chin. J. Catal., 2023, 46: 1–3 doi: 10.1016/S1872-2067(22)64206-2

Novel mechanism for selective cracking of sugars on WO_3 and its significance for biomass utilization

Johannes A. Lercher *
Technische Universität München, Germany;
Pacific Northwest National Laboratory, USA



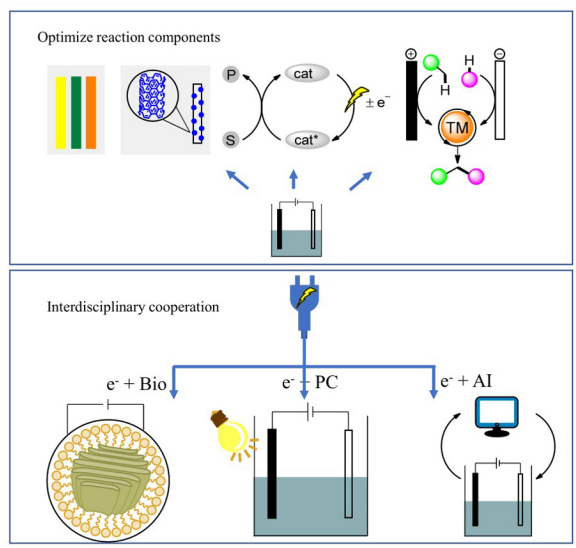
A novel mechanism for selective cracking of sugars to $C_{2,3}$ intermediates on WO_3 has been reported recently by Liu and coworkers, *via* a tridentate complex involving coordination of C=O, α-OH and β-OH with two adjacent tungsten atoms.

Viewpoint

Chin. J. Catal., 2023, 46: 4–10 doi: 10.1016/S1872-2067(22)64197-4

Organic electrochemistry-current transfer future

He-Yang Zhou, Hai-Tao Tang *, Wei-Min He *
Guangxi Normal University;
University of South China



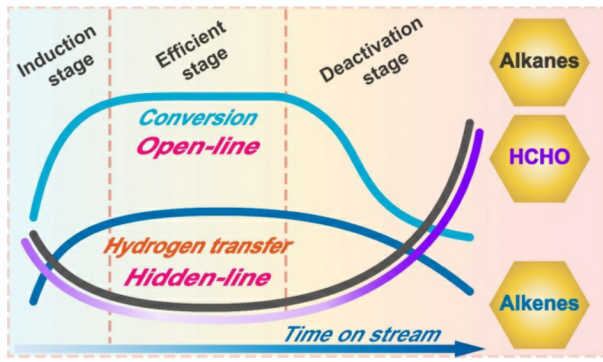
Based on the existing literature reports on organic electrochemistry, this paper briefly discusses several research fields of organic electrochemistry. Combined with the development of the discipline, the future development trend and field of organic electrochemistry are prospected.

Articles

Chin. J. Catal., 2023, 46: 11–27 doi: 10.1016/S1872-2067(22)64194-9

Hydrogen transfer reaction contributes to the dynamic evolution of zeolite-catalyzed methanol and dimethyl ether conversions: Insight into formaldehyde

Shanfan Lin, Yuchun Zhi, Wenna Zhang, Xiaoshuai Yuan, Chengwei Zhang, Mao Ye, Shutao Xu, Yingxu Wei *, Zhongmin Liu *
Dalian Institute of Chemical Physics, Chinese Academy of Sciences;
University of Chinese Academy of Sciences

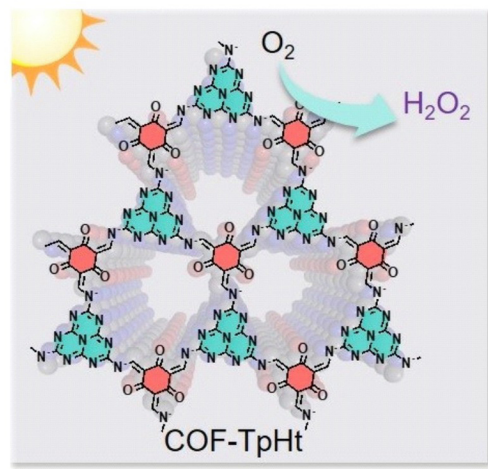


Dynamically evolving hydrogen transfer (HT) reactions as the hidden-line simultaneously occur and interplay with the main reactions of olefin generation as the open-line, constituting a complete dynamic reaction network for methanol and DME conversion. Modulating reaction network with depressing HT reactions for a moderate autocatalysis evolution is critical to realize a long-term and highly efficient reaction process.

Chin. J. Catal., 2023, 46: 28–35 doi: 10.1016/S1872-2067(22)64205-0

A covalent organic framework inspired by C_3N_4 for photosynthesis of hydrogen peroxide with high quantum efficiency

Chaochen Shao, Qing He, Mochun Zhang, Lin Jia, Yujin Ji, Yongpan Hu, Youyong Li, Wei Huang *, Yanguang Li *
Soochow University

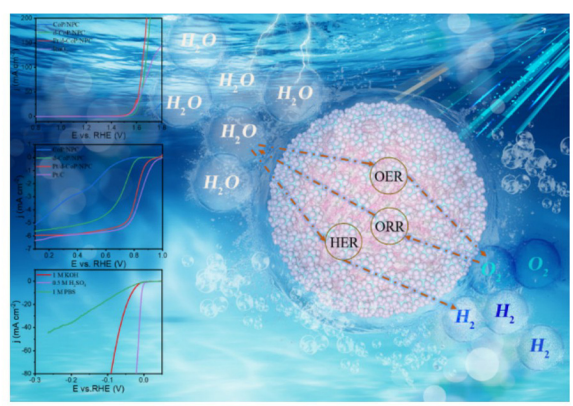


A C_3N_4-inspired structural design of covalent heptazine frameworks is proposed. The resultant material exhibits an excellent photocatalytic activity for H_2O_2 production, exceeding those of most other organic and inorganic counterparts.

Chin. J. Catal., 2023, 46: 36–47 doi: 10.1016/S1872-2067(22)64198-6

Surface-enriched ultrafine Pt nanoparticles coupled with defective CoP as efficient trifunctional electrocatalyst for overall water splitting and flexible Zn-air battery

Zexing Wu, Yuxiao Gao, Zixuan Wang, Weiping Xiao, Xinping Wang, Bin Li *, Zhenjiang Li, Xiaobin Liu, Tianyi Ma, Lei Wang *
Qingdao University of Science and Technology, China;
Nanjing Forestry University, China;
RMIT University, Australia

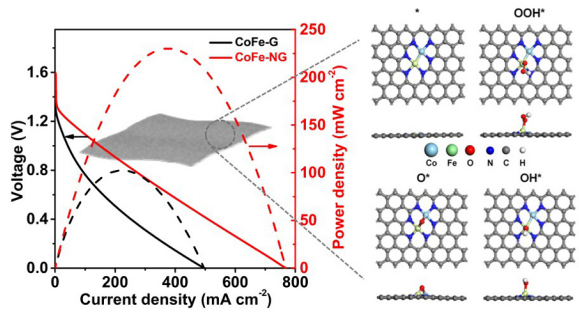


The efficient catalyst of Pt/d-CoP/NPC exhibits excellent full-pH HER and basic OER and ORR performances that are applied in a two-electrode device of overall water splitting and rechargeable Zn-air battery.

Chin. J. Catal., 2023, 46: 48–55 doi: 10.1016/S1872-2067(22)64189-5

Dual-atom Co-Fe catalysts for oxygen reduction reaction

Tianmi Tang, Yin Wang, Jingyi Han, Qiaoqiao Zhang, Xue Bai, Xiaodi Niu *, Zhenlu Wang, Jingqi Guan *
Jilin University; Inner Mongolia Minzu University

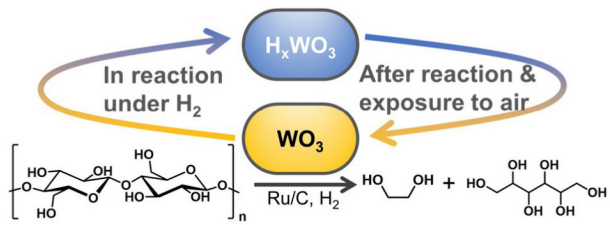


Dual-atom Co-Fe catalysts exhibit excellent ORR performance due to the synergistic effect of Co-Fe dual-sites in the CoFe-NG lowering the energy barrier for the ORR, which can be assembled into zinc-air batteries as air-cathode catalysts, delivering a high peak power density of 230 mW cm^{-2}.

Chin. J. Catal., 2023, 46: 56–63 doi: 10.1016/S1872-2067(22)64187-1

Unraveling the active states of WO_3-based catalysts in the selective conversion of cellulose to glycols

Yue Liu, Wei Zhang, Haichao Liu *
Peking University

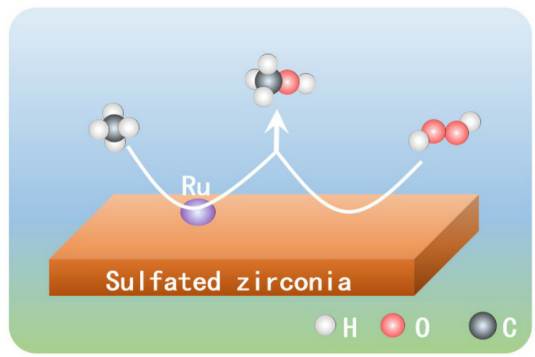


Tungsten trioxide (WO_3) undergoes reduction to hydrogen tungsten bronze (H_xWO_3) under H_2, which was re-oxidized to WO_3 upon exposure to air. Both WO_3 and H_xWO_3 are heterogeneous catalysts in the conversion of cellulose to ethylene glycol.

Chin. J. Catal., 2023, 46: 64–71 doi: 10.1016/S1872-2067(22)64191-3

Ru single-atom catalyst anchored on sulfated zirconia for direct methane conversion to methanol

Hua Liu, Leilei Kang, Hua Wang, Qike Jiang, Xiao Yan Liu *, Aiqin Wang
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences

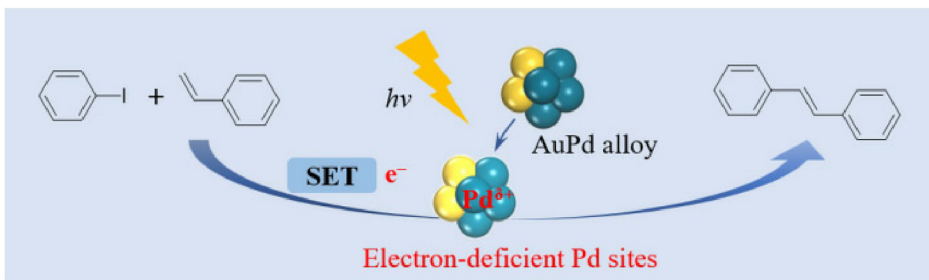


The sulfated zirconia (SZ) supported Ru/SZ single-atom catalysts exhibited excellent catalytic performance for the direct CH_4 conversion to methanol, which could be attributed to the synergistic catalytic effect of the Ru single atoms and strong acid sites of the catalysts.

Chin. J. Catal., 2023, 46: 72–83 doi: 10.1016/S1872-2067(22)64192-5

***In-situ* formation of electron-deficient Pd sites on AuPd alloy nanoparticles under irradiation enabled efficient photocatalytic Heck reaction**

Haifeng Wang, Fan Wang, Xiaopeng Li, Qi Xiao *, Wei Luo, Jingsan Xu *
Donghua University, China; Leibniz-Institut für Katalyse e.V. an der Universität Rostock, Germany; Queensland University of Technology, Australia

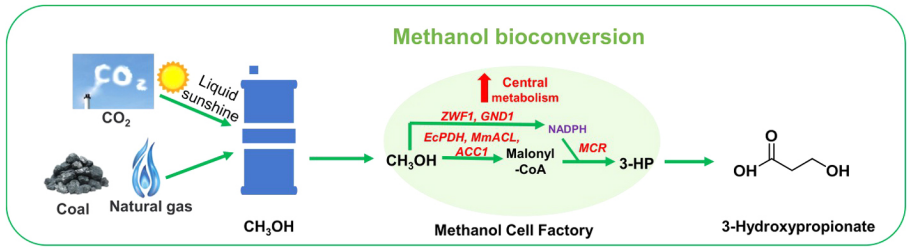


Photocatalytic Heck reaction proceeds *via* a new radical-based single-electron transfer pathway on the AuPd alloy, the *in-situ* formed electron-deficient Pd sites provide efficient catalytic sites for the reaction under irradiation.

Chin. J. Catal., 2023, 46: 84–90 doi: 10.1016/S1872-2067(22)64195-0

Bioconversion of methanol to 3-hydroxypropionate by engineering *Ogataea polymorpha*

Wei Yu, Jiaoqi Gao, Lun Yao, Yongjin J. Zhou *
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences



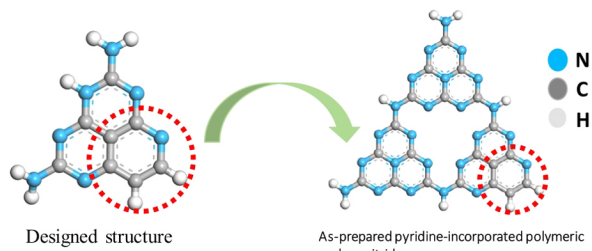
Metabolic engineering of *Ogataea polymorpha* to enhance the supply of malonyl-CoA and NADPH enabled high-level production of 3-hydroxypropionate from sole methanol, demonstrating the potential of methanol cell factory for chemical production.

Chin. J. Catal., 2023, 46: 91–102 doi: 10.1016/S1872-2067(22)64159-7

Theoretical design and experimental study of pyridine-incorporated polymeric carbon nitride with desired structure for boosting photocatalytic CO_2 reduction

Chengcheng Chen, Fangting Liu, Qiaoyu Zhang, Zhengguo Zhang, Qiong Liu *, Xiaoming Fang *
South China University of Technology;
Institute of Analysis, Guangdong Academy of Sciences

A pyridine-incorporated polymeric carbon nitride was theoretically designed and experimentally prepared, which exhibited a high CO evolution rate and a selectivity of 99.6% and showed an apparent quantum efficiency of 2.86% at λ = 420 nm.

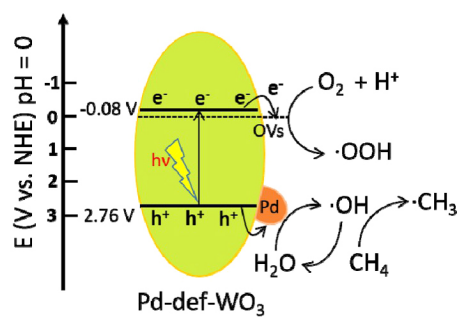


Chin. J. Catal., 2023, 46: 103–112 doi: 10.1016/S1872-2067(22)64169-X

Photocatalytic methane activation by dual reaction sites co-modified WO_3

Keran Wang, Lei Luo *, Chao Wang, Junwang Tang*
Northwest University, China;
University College London, UK

Pd and oxygen vacancies co-modified WO_3 are employed for selective CH_4 conversion, achieving a high yield of 7018 μmol·g^{-1}·h^{-1}, and a high selectivity of 81% towards primary products.

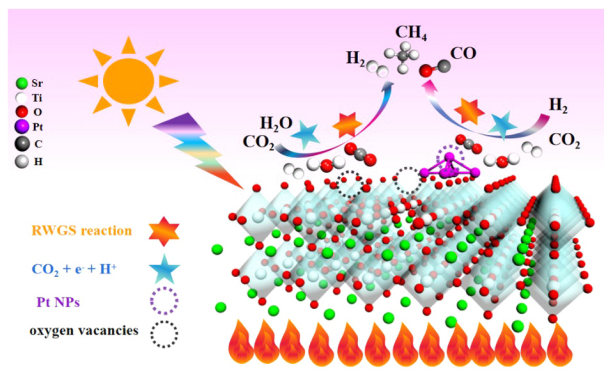


Chin. J. Catal., 2023, 46: 113–124 doi: 10.1016/S1872-2067(22)64175-5

Promotion of dual-reaction pathway in CO_2 reduction over $Pt^0/SrTiO_{3-\delta}$: Experimental and theoretical verification

Zhuogen Li, Qadeer Ul Hassan, Weibin Zhang, Lujun Zhu, Jianzhi Gao, Xianjin Shi, Yu Huang, Peng Liu, Gangqiang Zhu *
Shaanxi Normal University;
Yunnan Normal University;
Institute of Earth Environment, Chinese Academy of Sciences

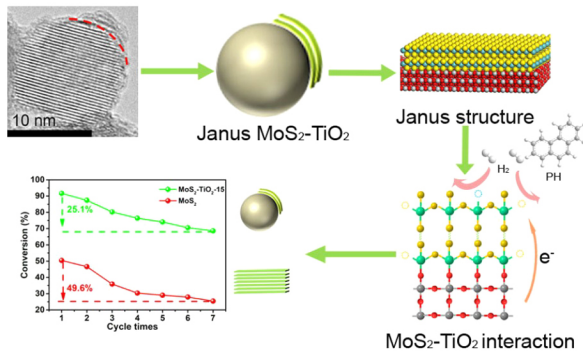
The dual reaction pathway including RWGS reaction and CO_2 protonation in the photothermal catalysis CO_2 reduction with H_2O was probed and clarified over the Schottky contact Pt-supported $SrTiO_{3-\delta}$ nanostructure.



Chin. J. Catal., 2023, 46: 125–136 doi: 10.1016/S1872-2067(22)64184-6

Highly active and stable MoS_2-TiO_2 nanocomposite catalyst for slurry-phase phenanthrene hydrogenation

Chenggong Yang, Donge Wang *, Rong Huang, Jianqiang Han, Na Ta, Huaijun Ma, Wei Qu, Zhendong Pan, Congxin Wang, Zhijian Tian *
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences

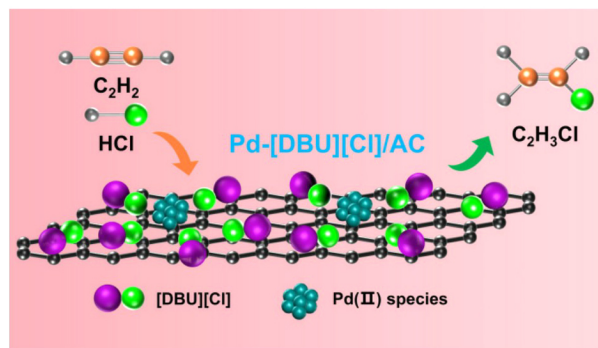


MoS_2-TiO_2 nanocomposite catalyst with Janus structure synthesized by one-step solvothermal method can expose more active Mo sites and generate strong MoS_2-TiO_2 interaction, which can efficiently enhance the catalytic hydrogenation activity and stability of MoS_2-TiO_2 nanocomposite catalyst.

Chin. J. Catal., 2023, 46: 137–147 doi: 10.1016/S1872-2067(22)64204-9

Enhanced performance of Pd-[DBU][Cl]/AC mercury-free catalysts in acetylene hydrochlorination

Xingzong Dong, Guangye Liu, Zhaoan Chen, Quan Zhang, Yunpeng Xu *, Zhongmin Liu
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences

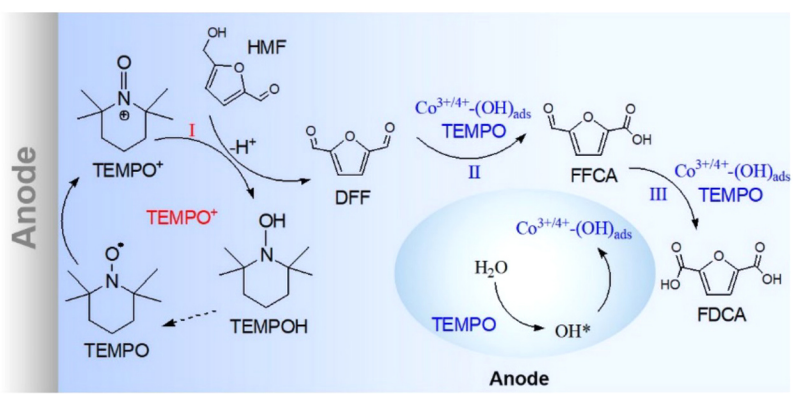


The coordination effect between $PdCl_2$ and [DBU][Cl] enhances the HCl adsorption, suppresses the Pd-[DBU][Cl]/AC catalyst deactivation and ensures that the catalyst exhibits excellent activity and chemical stability in the acetylene hydrochlorination.

Chin. J. Catal., 2023, 46: 148–156 doi: 10.1016/S1872-2067(22)64203-7

Boosting 5-hydroxymethylfurfural electrooxidation in neutral electrolytes *via* TEMPO-enhanced dehydrogenation and OH adsorption

Hongfang Wang, Leitao Xu, Jingcheng Wu, Peng Zhou, Shasha Tao, Yuxuan Lu, Xianwen Wu, Shuangyin Wang, Yuqin Zou *
Hunan University; Jishou University

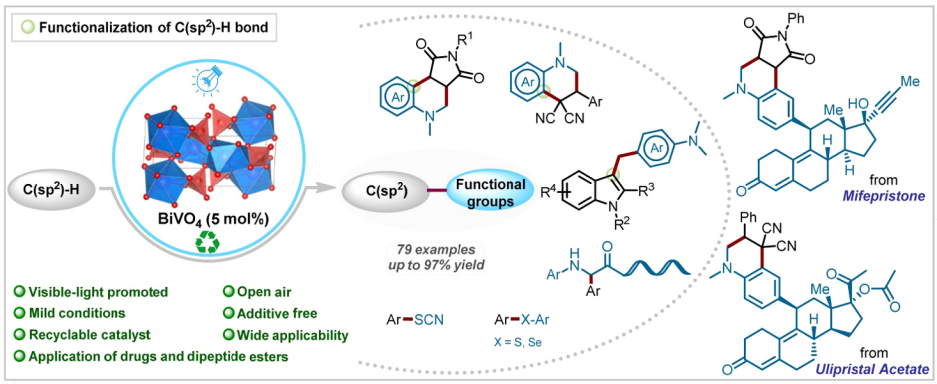


TEMPO mediator enables a fast conversion of HMF to DFF (Step I) whilst favor water activation to supply OH^* absorbed on electrogenerated active $Co^{3+/4+}$ electrode to facilitate formyl group-involved intermediates converting into FDCA (Step II-III).

Chin. J. Catal., 2023, 46: 157–166 doi: 10.1016/S1872-2067(23)64391-8

Bismuth vanadate: A versatile heterogeneous catalyst for photocatalytic functionalization of C(sp^2)–H bonds

Fan-Lin Zeng, Hu-Lin Zhu, Ru-Nan Wang, Xiao-Ya Yuan, Kai Sun, Ling-Bo Qu, Xiao-Lan Chen *, Bing Yu *
Zhengzhou University



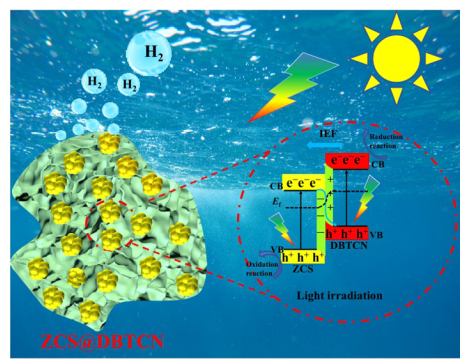
The bismuth vanadate synthesized by the hydrothermal/calcination combined method at 180 °C ($BiVO_4$-180) is demonstrated to be a versatile heterogeneous photocatalyst for diverse C(sp^2)–H functionalization reactions under visible light irradiation at ambient conditions.

Chin. J. Catal., 2023, 46: 167–176 doi: 10.1016/S1872-2067(22)64201-3

S-scheme heterojunction of ZnCdS nanospheres and dibenzothiophene modified graphite carbon nitride for enhanced H_2 production

Han Li, Shanren Tao, Sijie Wan, Guogen Qiu, Qing Long, Jiaguo Yu, Shaowen Cao *
Wuhan University of Technology; China University of Geosciences

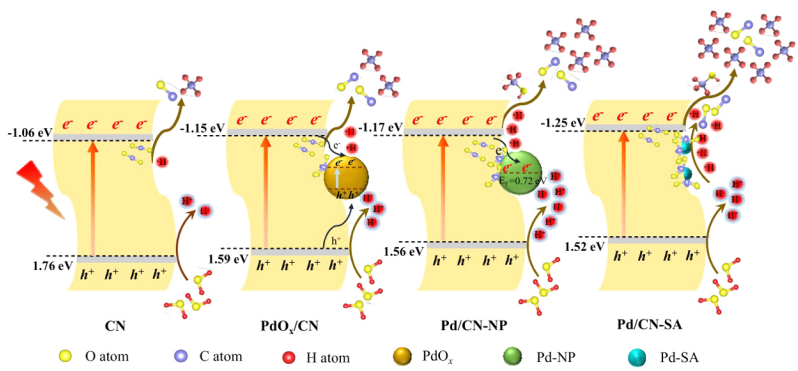
The synergistic effect of intramolecular internal electric field and S-scheme heterojunction not only accelerates the separation and transfer of photogenerated carriers, but also preserves the maximum redox capacity of the electrons and holes.



Chin. J. Catal., 2023, 46: 177–190 doi: 10.1016/S1872-2067(22)64199-8

Effect of palladium chemical states on CO_2 photocatalytic reduction over g-C_3N_4: Distinct role of single-atomic state in boosting CH_4 production

Qian Li, Qijun Tang, Peiyao Xiong, Dongzhi Chen, Jianmeng Chen, Zhongbiao Wu *, Haiqiang Wang *
Zhejiang University; Zhejiang Provincial Engineering Research Center of Industrial Boiler & Furnace Flue Gas Pollution Control; Zhejiang Ocean University; Zhejiang Key Laboratory of Petrochemical Environmental Pollution Control



The chemical states of palladium influence much on the CO_2 photocatalytic reduction performance of g-C_3N_4 (CN). The conducive CO_2 activation, negative conduction band potentials, and excellent •H utilization efficiency, collaboratively contributed to the superior CH_4 production of Pd/CN-SA (single-atom Pd anchored on CN).