

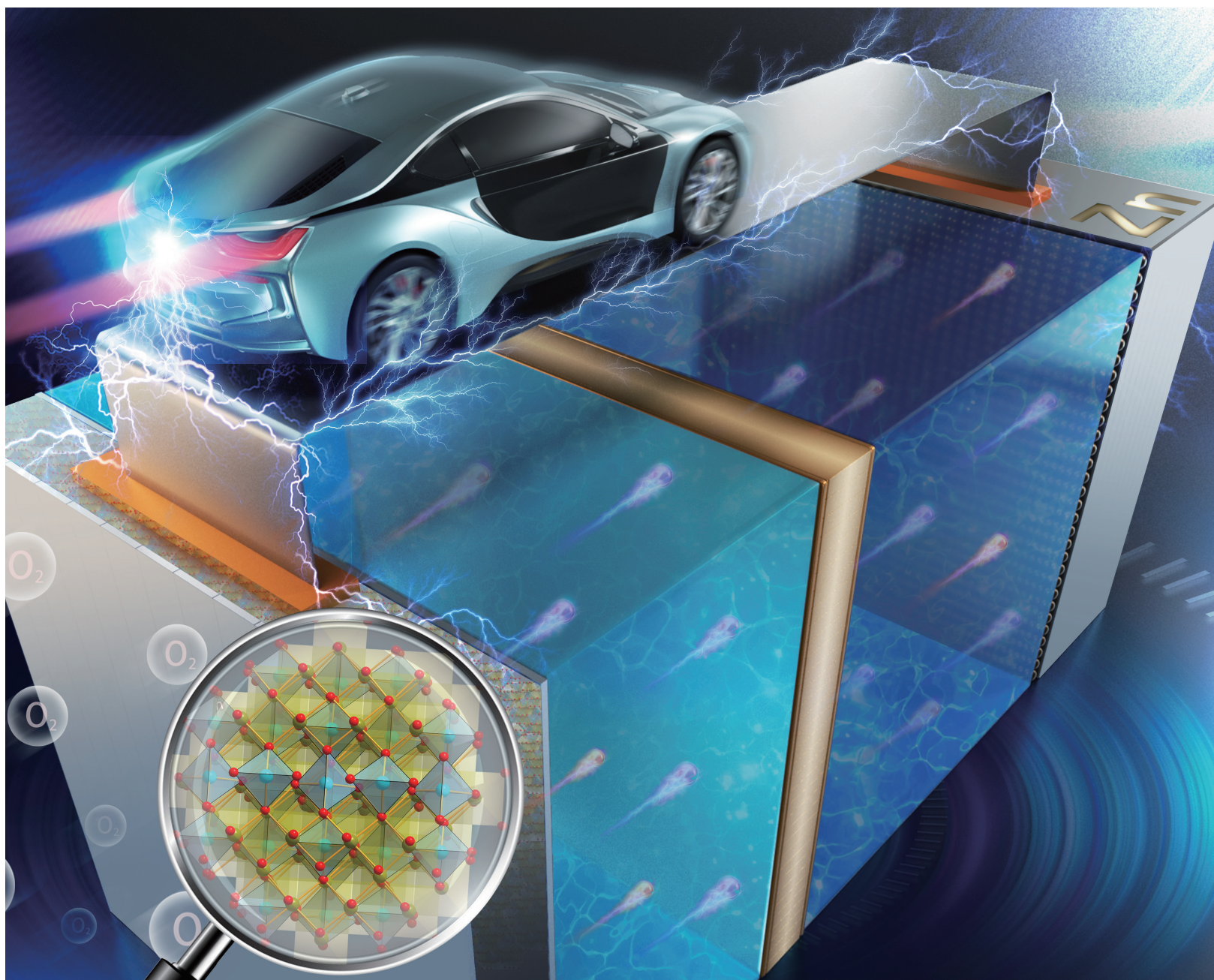
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万方数据

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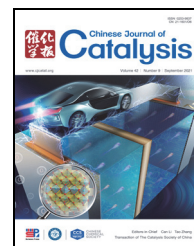
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## Chinese Journal of Catalysis

### Graphical Contents

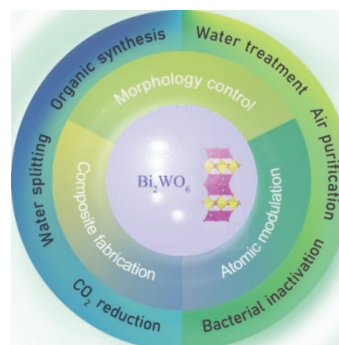
#### Review

*Chin. J. Catal.*, 2021, 42: 1413–1438 doi: 10.1016/S1872-2067(20)63769-X

#### Recent advances on $\text{Bi}_2\text{WO}_6$ -based photocatalysts for environmental and energy applications

Tong Chen, Lizhen Liu, Cheng Hu, Hongwei Huang\*  
China University of Geosciences

This review provides a systematic summary on the recent advances of  $\text{Bi}_2\text{WO}_6$ -based photocatalysts in fields of energy and environment. More importantly, different modification strategies for improving the photocatalytic activity of  $\text{Bi}_2\text{WO}_6$  were discussed.



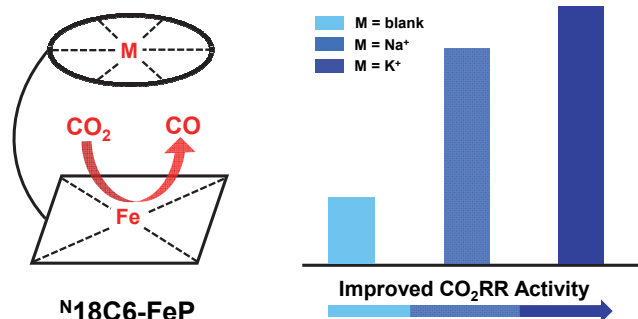
#### Communications

*Chin. J. Catal.*, 2021, 42: 1439–1444 doi: 10.1016/S1872-2067(20)63762-7

#### Alkali metal cation effects on electrocatalytic $\text{CO}_2$ reduction with iron porphyrins

Kai Guo, Haitao Lei, Xialiang Li, Zongyao Zhang, Yabo Wang,  
Hongbo Guo, Wei Zhang, Rui Cao\*  
Shaanxi Normal University, China; University of Oxford, UK

Using an iron porphyrin bearing a tethered  $\text{N}^{18}\text{C}6$  group, the effect of alkali metal cations, such as sodium and potassium, on improving electrocatalytic  $\text{CO}_2\text{RR}$  is demonstrated.

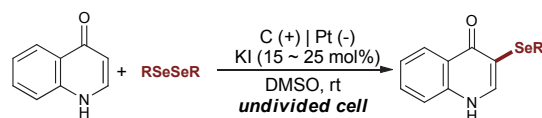


*Chin. J. Catal.*, 2021, 42: 1445–1450 doi: 10.1016/S1872-2067(20)63750-0

#### Sustainable electrochemical cross-dehydrogenative coupling of 4-quinolones and diorganyl diselenides

Jin-Yang Chen, Hong-Yu Wu, Qing-Wen Gui, Shan-Shu Yan, Jie Deng,  
Ying-Wu Lin, Zhong Cao, Wei-Min He\*  
University of South China; Yangtze Normal University;  
Changsha University of Science and Technology

A green and practical approach for the synthesis of 3-organylselenyl quinolones through the electrochemical cross-dehydrogenative coupling of 4-quinolones and diorganyl diselenides under oxidant- and external electrolyte-free conditions was developed.



21 examples, 81–94%, up to 2.8 g  
Atom-Economy & Reusability & Self-phase Separation  
Chemical Oxidant-, External Electrolyte-Free

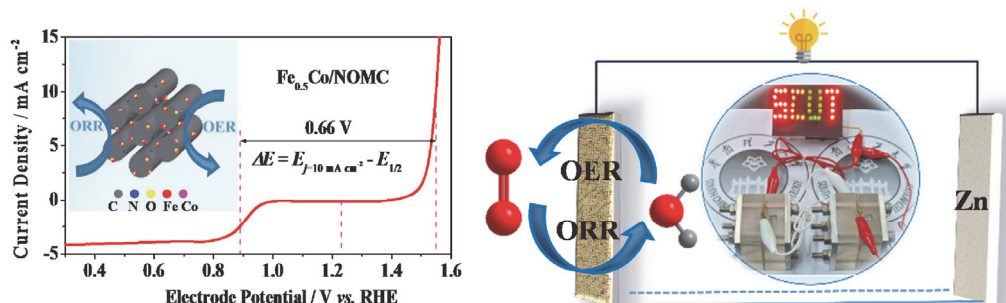


## Articles

*Chin. J. Catal.*, 2021, 42: 1451–1458 doi: 10.1016/S1872-2067(20)63752-4

### Efficient spinel iron-cobalt oxide/nitrogen-doped ordered mesoporous carbon catalyst for rechargeable zinc-air batteries

He-lei Wei, Ai-dong Tan \*, Shu-zhi Hu, Jin-hua Piao, Zhi-yong Fu \*  
South China University of Technology

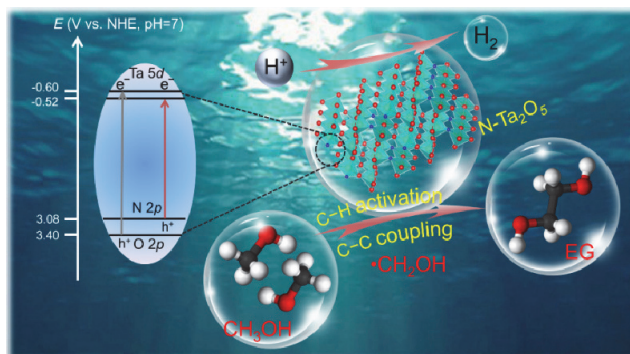


A robust ORR/OER oxygen-related catalyst was synthesized *via* a one-step method. A rechargeable zinc-air battery assembled using the optimal catalyst, *viz.* Fe<sub>0.5</sub>Co/NOMC, exhibits a power density of 153 mW cm<sup>-2</sup> at 1.0 V and superior cycling stability.

*Chin. J. Catal.*, 2021, 42: 1459–1467 doi: 10.1016/S1872-2067(21)63797-X

### Solar energy-driven C–H activation of methanol for direct C–C coupling to ethylene glycol with high stability by nitrogen doped tantalum oxide

Limei Wang, Daxue Du, Biao Zhang, Shunji Xie \*, Qinghong Zhang, Haiyan Wang \*, Ye Wang \*  
Yanshan University; Xiamen University



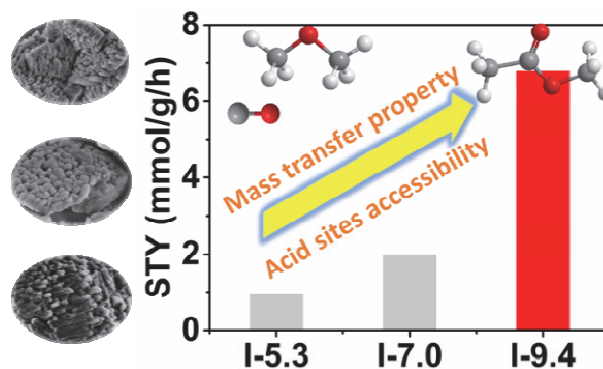
Photocatalytic activation of C–H bond within methanol to form hydroxymethyl radical ( $\bullet\text{CH}_2\text{OH}$ ) and subsequent C–C coupling to ethylene glycol (EG) with high selectivity and stability by co-catalyst free nitrogen doped tantalum oxide (N-Ta<sub>2</sub>O<sub>5</sub>) were reported.

*Chin. J. Catal.*, 2021, 42: 1468–1477 doi: 10.1016/S1872-2067(20)63777-9

### Organic-free synthesis of MOR nanoassemblies with excellent DME carbonylation performance

Kaipeng Cao, Dong Fan, Shu Zeng, Benhan Fan, Nan Chen, Mingbin Gao, Dali Zhu, Linying Wang, Peng Tian \*, Zhongmin Liu \*  
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences

MOR nanoassemblies with SAR up to 9.4 were synthesized efficiently *via* an organic-free route. A steady M<sub>ac</sub> yield of 6.8 mmol/g/h with *ca.* 100% selectivity was achieved on pyridine-modified H-MOR nanoassemblies with SAR of 9.4, owing to superior mass transfer performance and accessibility of the acid sites.

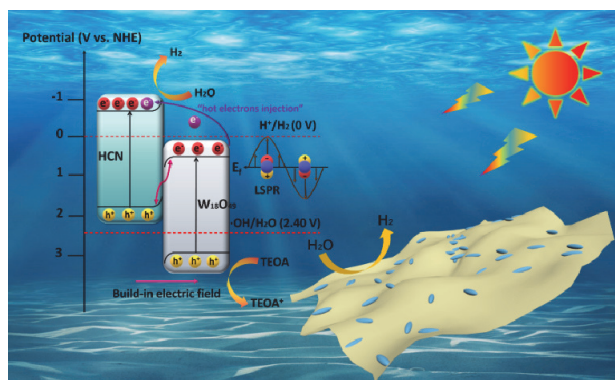


*Chin. J. Catal.*, 2021, 42: 1478–1487 doi: 10.1016/S1872-2067(20)63753-6

### Hot-electron-assisted S-scheme heterojunction of tungsten oxide/graphitic carbon nitride for broad-spectrum photocatalytic H<sub>2</sub> generation

Qinqin Liu, Xudong He, Jinjun Peng, Xiaohui Yu, Hua Tang\*, Jun Zhang\*  
Jiangsu University; Wuhan Institute of Technology

A plasmonic 1D/2D W<sub>18</sub>O<sub>49</sub>/HCN S-scheme heterojunction photocatalyst was synthesized, and W<sub>18</sub>O<sub>49</sub> plasmon can generate hot electrons that helped to achieve high photocatalytic performance over a broad spectrum.

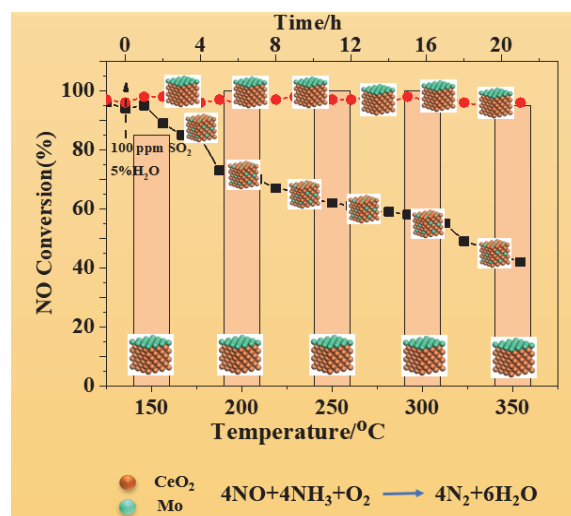


*Chin. J. Catal.*, 2021, 42: 1488–1499 doi: 10.1016/S1872-2067(20)63778-0

### Effects of different methods of introducing Mo on denitration performance and anti-SO<sub>2</sub> poisoning performance of CeO<sub>2</sub>

Lulu Li, Chengyan Ge, Jiawei Ji, Wei Tan, Xin Wang, Xiaoqian Wei, Kai Guo, Changjin Tang\*, Lin Dong\*  
Nanjing University; Jiangsu University of Science and Technology; YanCheng Institute of Technology; Nanjing Normal University

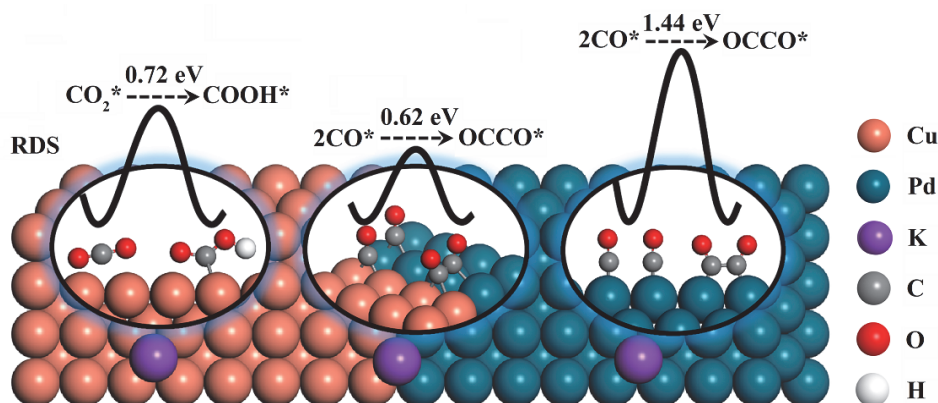
The NH<sub>3</sub>-SCR efficiency of Mo-CeO<sub>2</sub> and MoCe-cp catalysts was significantly improved by Mo modification. The method of preparing the two MoCe catalysts significantly affects the SCR activity.



*Chin. J. Catal.*, 2021, 42: 1500–1508 doi: 10.1016/S1872-2067(20)63754-8

### Tuning the intermediate reaction barriers by a CuPd catalyst to improve the selectivity of CO<sub>2</sub> electroreduction to C<sub>2</sub> products

Li Zhu, Yiyang Lin, Kang Liu, Emiliano Cortés, Hongmei Li, Junhua Hu, Akira Yamaguchi, Xiaoliang Liu\*, Masahiro Miyauchi\*, Junwei Fu\*, Min Liu\*  
Central South University, China; Ludwig-Maximilians-Universität München, Germany; Zhengzhou University, China; Tokyo Institute of Technology, Japan



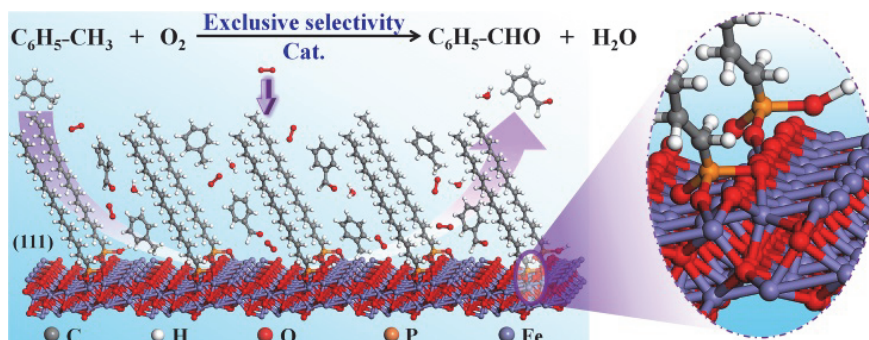
A CuPd(100) catalyst was designed and fabricated to improve the selectivity of the electroreduction of CO<sub>2</sub> to C<sub>2</sub> products by tuning the CO<sub>2</sub> adsorption ability and intermediate reaction barriers.



*Chin. J. Catal.*, 2021, 42: 1509–1518 doi: 10.1016/S1872-2067(20)63758-5

### Enzyme-like mechanism of selective toluene oxidation to benzaldehyde over organophosphoric acid-bonded nano-oxides

Changshun Deng, Yun Cui, Junchao Chen, Teng Chen, Xuefeng Guo, Weijie Ji, Luming Peng, Weiping Ding \*  
Nanjing University



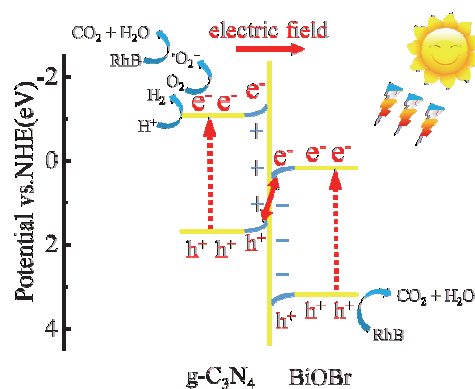
HDPa-FeMO<sub>x</sub>/γ-Al<sub>2</sub>O<sub>3</sub> is an enzyme-like catalyst for the exclusive conversion of toluene to benzaldehyde through O<sub>2</sub> oxidation under mild conditions.

*Chin. J. Catal.*, 2021, 42: 1519–1529 doi: 10.1016/S1872-2067(20)63765-2

### Novel S-scheme 2D/2D BiOBr/g-C<sub>3</sub>N<sub>4</sub> heterojunctions with enhanced photocatalytic activity

Bin Zhang, Xiaoyun Hu, Enzhou Liu \*, Jun Fan \*  
Northwest University

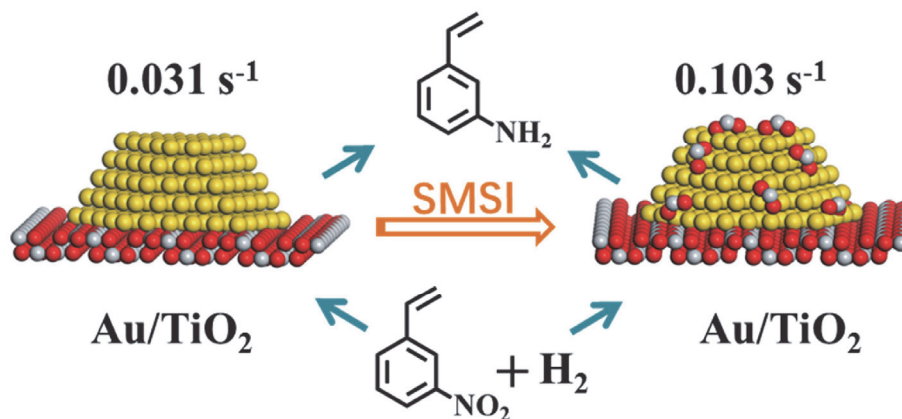
2D/2D step-scheme BiOBr/g-C<sub>3</sub>N<sub>4</sub> heterojunctions with intimate interface contact, abundant active sites, and efficient charge transfer exhibited enhanced photocatalytic activity for H<sub>2</sub> evolution and organic dye degradation.



*Chin. J. Catal.*, 2021, 42: 1530–1537 doi: 10.1016/S1872-2067(20)63763-9

### Strong metal-support interaction boosting the catalytic activity of Au/TiO<sub>2</sub> in chemoselective hydrogenation

Feng Hong, Shengyang Wang, Junying Zhang, Junhong Fu, Qike Jiang, Keju Sun \*, Jiahui Huang \*  
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Yanshan University



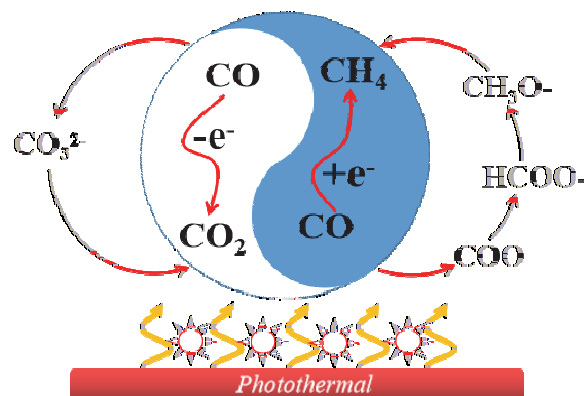
Strong metal-support interactions between Au and TiO<sub>2</sub> can induce TiO<sub>2</sub> invading the Au NP surface, accompanied by an enlarged perimeter. This effect can improve the hydrogen activation and boost the activity of the 3-nitrostyrene chemoselective hydrogenation reaction.

*Chin. J. Catal.*, 2021, 42: 1538–1552 doi: 10.1016/S1872-2067(20)63760-3

### Thermo-driven photocatalytic CO reduction and H<sub>2</sub> oxidation over ZnO via regulation of reactant gas adsorption electron transfer behavior

Zhongming Wang, Hong Wang, Xiaoxiao Wang, Xun Chen, Yan Yu, Wenxin Dai \*, Xianzhi Fu \*  
Fuzhou University

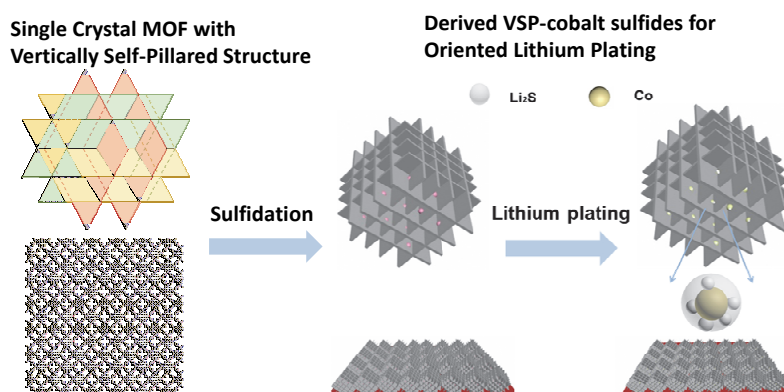
CO (ads) donates electrons to ZnO under only light or heat energy in a facile oxidation reaction, while CO (ads) accepts electrons from ZnO under photothermal conditions, which is favorable for the CO reduction reaction.



*Chin. J. Catal.*, 2021, 42: 1553–1560 doi: 10.1016/S1872-2067(20)63755-X

### Single crystal metal-organic framework constructed by vertically self-pillared nanosheets and its derivative for oriented lithium plating

Xiaomin Jia†, Shaowen Li†, Tu Sun†, Yanzhi Wang†, Yaqi Fan, Chaochao Zhang, Yang Xu, Zuozhong Liang, Haitao Lei, Wei Zhang, Yuye Zhou, Yanhang Ma, Haoquan Zheng \*, Yue Ma \*, Rui Cao \*  
Shaanxi Normal University, China; Northwestern Polytechnical University, China; ShanghaiTech University, China; KTH Royal Institute of Technology, Sweden



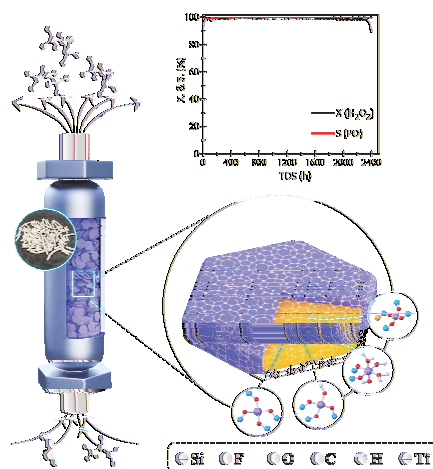
A single crystal metal-organic framework constructed by vertically self-pillared nanosheets has been prepared. Derived VSP-cobalt sulfides were employed for oriented lithium plating in metallic batteries.

*Chin. J. Catal.*, 2021, 42: 1561–1575 doi: 10.1016/S1872-2067(20)63759-7

### Structured binder-free MWW-type titanasilicate with Si-rich shell for selective and durable propylene epoxidation

Jinpeng Yin, Xin Jin, Hao Xu \*, Yejun Guan, Rusi Peng, Li Chen, Jingang Jiang, Peng Wu \*  
East China Normal University

A binder-free Ti-MWW catalyst with attractive HPPO performance has been prepared via a combination method of shaping, recrystallization, and chemical modification of Ti sites.



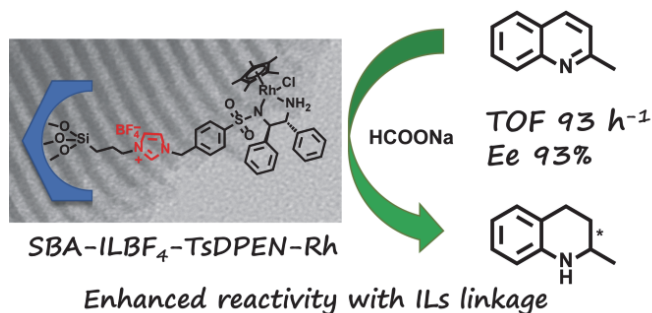


*Chin. J. Catal.*, 2021, 42: 1576–1585 doi: 10.1016/S1872-2067(20)63764-0

### Development of efficient solid chiral catalysts with designable linkage for asymmetric transfer hydrogenation of quinoline derivatives

Yiqi Ren, Lin Tao, Chunzhi Li, Sanjeevi Jayakumar, He Li, Qihua Yang\*  
Dalian Institute of Chemical Physics, Chinese Academy of Sciences;  
University of Chinese Academy of Sciences

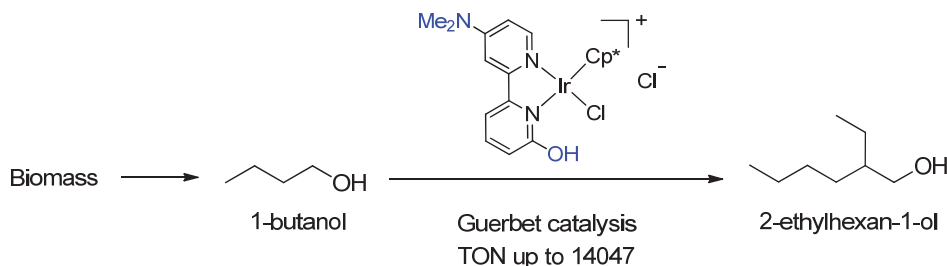
A new solid chiral catalyst with a designable linkage was developed. SBA-ILBF<sub>4</sub>-TsDPEN-Rh, containing an IL linkage, could catalyze the asymmetric transfer hydrogenation of quinaldine with 93 h<sup>-1</sup> TOF and 93% ee.



*Chin. J. Catal.*, 2021, 42: 1586–1592 doi: 10.1016/S1872-2067(20)63772-X

### Electronic and steric factors for enhanced selective synthesis of 2-ethyl-1-hexanol in the Ir-complex-catalyzed Guerbet reaction of 1-butanol

Zhanwei Xu, Peifang Yan, Changhui Liang, Songyan Jia, Xiumei Liu, Z. Conrad Zhang\*  
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences;  
Shenyang University of Chemical Technology

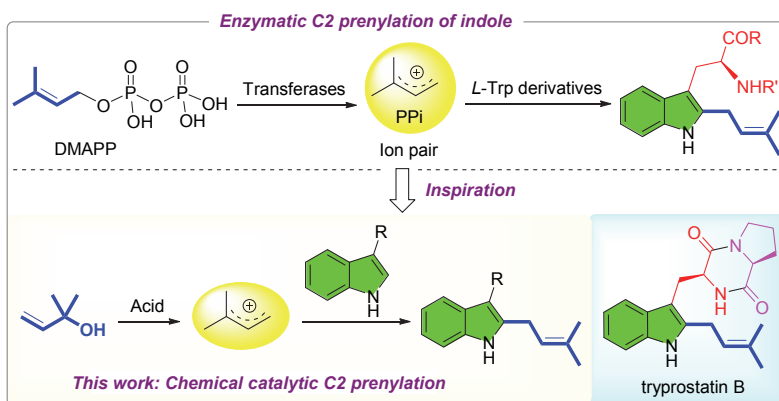


An enhanced catalytic Guerbet reaction of 1-butanol to 2-ethyl-1-hexanol by a Cp\*Ir complex was reported.

*Chin. J. Catal.*, 2021, 42: 1593–1607 doi: 10.1016/S1872-2067(20)63780-9

### Catalytic C2 prenylation of unprotected indoles: Late-stage diversification of peptides and two-step total synthesis of tryprostatin B

Yan-Cheng Hu, Ying Li, Ding-Wei Ji, Heng Liu, Hao Zheng, Gong Zhang, Qing-An Chen\*  
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences



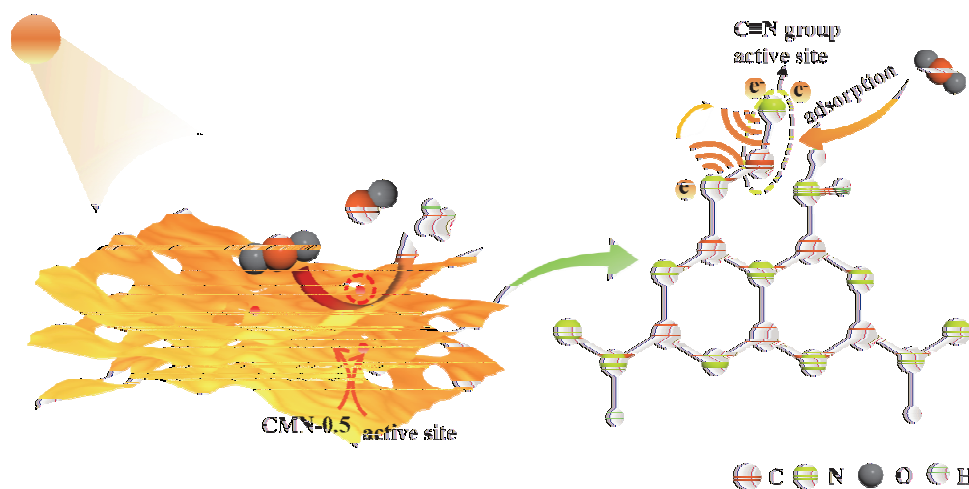
Since C2 prenylated indoles are widespread in nature, the selective installation of prenyl group at C2 position of NH indoles is of great significance. However, the known protocols generally require a multi-step procedure and stoichiometric promoters. Herein a chemical catalytic C2 prenylation of NH indoles is developed, which can be applied to late-stage diversification of peptides and concise synthesis of tryprostatin B.

*Chin. J. Catal.*, 2021, 42: 1608–1616 doi: 10.1016/S1872-2067(20)63776-7

### Construction of efficient active sites through cyano-modified graphitic carbon nitride for photocatalytic CO<sub>2</sub> reduction

Fang Li, Xiaoyang Yue, Haiping Zhou, Jiajie Fan, Qunjun Xiang \*

University of Electronic Science and Technology of China; Zhengzhou University



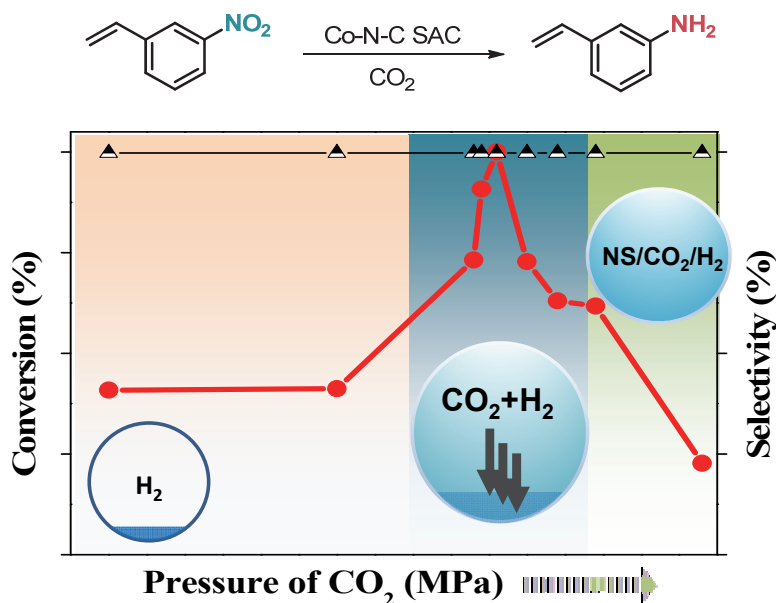
Cyano-modified porous g-C<sub>3</sub>N<sub>4</sub> nanosheets (MCN-0.5) with cyano groups as active sites exhibited enhanced photocatalytic activity for CO<sub>2</sub> reduction.

*Chin. J. Catal.*, 2021, 42: 1617–1624 doi: 10.1016/S1872-2067(20)63785-8

### Reaction kinetics and phase behavior in the chemoselective hydrogenation of 3-nitrostyrene over Co-N-C single-atom catalyst in compressed CO<sub>2</sub>

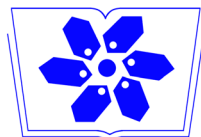
Dan Zhou, Leilei Zhang \*, Wengang Liu, Gang Xu, Ji Yang, Qike Jiang, Aiqin Wang \*, Jianzhong Yin \*

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



An inverted V-curve relation was observed between conversion and  $P_{\text{CO}_2}$  in hydrogenation of 3-nitrostyrene over Co-N-C SACs in compressed CO<sub>2</sub>, where the peak was attributed to the enhanced solubility of H<sub>2</sub> in CO<sub>2</sub>-expanded substrate liquid.





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## 目次

### 综 述

1413

**Bi<sub>2</sub>WO<sub>6</sub> 基光催化剂在环境和能源领域的最新研究进展**

陈通, 刘丽珍, 胡程, 黄洪伟

### 快 讯

1439

**碱金属阳离子对铁卟啉电催化 CO<sub>2</sub> 还原的影响**

郭凯, 雷海涛, 李夏亮, 张宗尧, 王亚博, 郭鸿波, 张伟, 曹睿

1445

**电催化 4-喹诺酮和二烷基二硫醚的交叉脱氢偶联反应**

陈锦杨, 吴红谕, 桂清文, 晏山舒, 邓婕, 林英武, 曹忠, 何卫民

### 论 文

1451

**高效的尖晶石铁钴氧/氮掺杂有序介孔碳催化剂应用于可充电锌-空气电池**

韦何磊, 谭爱东, 胡树枝, 朴金花, 傅志勇

1459

**高稳定性的氮掺杂氧化钼光催化甲醇 C-H 活化和直接 C-C 偶联制乙二醇**

王力梅, 杜大学, 张彪, 谢顺吉, 张庆红, 王海燕, 王野

1468

**无机体系合成纳米丝光沸石组装体及其优异的二甲醚羰基化催化性能**

曹凯鹏, 樊栋, 曾姝, 樊本汉, 陈南, 高铭斌, 朱大丽, 王林英, 田鹏, 刘中民

1478

**热电子驱动氧化钨/石墨化氮化碳 S-型异质结实现宽光谱光催化产氢活性**

刘芹芹, 何旭东, 彭进军, 于晓慧, 唐华, 张军

1488

**Mo 的引入方式对 CeO<sub>2</sub> 脱硝性能的影响**

李露露, 葛成艳, 季稼伟, 谭伟, 王鑫, 魏小倩, 郭凯, 汤常金, 董林

1500

**CuPd 催化剂调节中间反应能垒提高电催化 CO<sub>2</sub> 生成二碳产物的选择性**

朱莉, 林翌阳, 刘康, Emiliano Cortés, 李红梅, 胡俊华, Akira Yamaguchi, 刘小良, Masahiro Miyauchi, 傅俊伟, 刘敏

1509

**烷基膦酸键合的纳米氧化物上甲苯选择氧化制苯甲醛的类酶机理**

邓长顺, 崔韵, 陈俊超, 陈腾, 郭学锋, 季伟捷, 彭路明, 丁维平

1519

**2D/2D BiOBr/g-C<sub>3</sub>N<sub>4</sub> S 型异质结光催化性能**

张彬, 胡晓云, 刘恩周, 樊君

1530

**金属载体强相互作用增强 Au/TiO<sub>2</sub> 催化剂在 3-硝基苯乙烯选择性加氢反应的活性**

洪峰, 王升扬, 张军营, 付俊红, 蒋齐可, 孙科举, 黄家辉

1538

**通过调节反应物气体吸附电子转移行为实现热驱动 ZnO 光催化 CO 还原和 H<sub>2</sub> 氧化反应**

王中明, 王洪, 王笑笑, 陈旬, 于岩, 戴文新, 付贤智

1553

**垂直自支撑式金属有机框架多级结构单晶用于锂定向沉积**  
贾晓敏, 李少雯, 孙凸, 王彦智, 范亚奇, 张超超, 徐杨, 梁作中, 雷海涛, 张伟, 周瑞烨, 马延航, 郑浩铨, 马越, 曹睿

1561

**壳层结构的无粘结剂 MWW 钛硅分子筛用作高选择性、高稳定性的丙烯环氧化**

尹金鹏, 金鑫, 徐浩, 关业军, 彭如斯, 陈丽, 蒋金刚, 吴鹏

1576

**喹啉及其衍生物的多相不对称氢转移反应**

任亦起, 陶琳, Sanjeevi Jayakumar, 李贺, 杨启华

1586

**电子和空间位阻效应促进铈配合物催化 1-丁醇经 Guerbet 反应选择制备 2-乙基己醇**

许占威, 颜佩芳, 梁长慧, 贾松岩, 刘秀梅, 张宗超

1593

**催化 NH 吡啶的 C2 异戊烯基化反应: 肽后期多样化和两步全合成 Tryprostatin B**

呼延成, 李莹, 李定伟, 刘恒, 郑浩, 张功, 陈庆安

1608

**氰基修饰石墨相氮化碳构建高效的活性位点用于光催化还原 CO<sub>2</sub>**

李访, 岳晓阳, 周海平, 范佳杰, 向全军

1617

**压缩 CO<sub>2</sub> 中 Co-N-C 催化 3-硝基苯乙烯选择性加氢反应动力学及相行为**

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