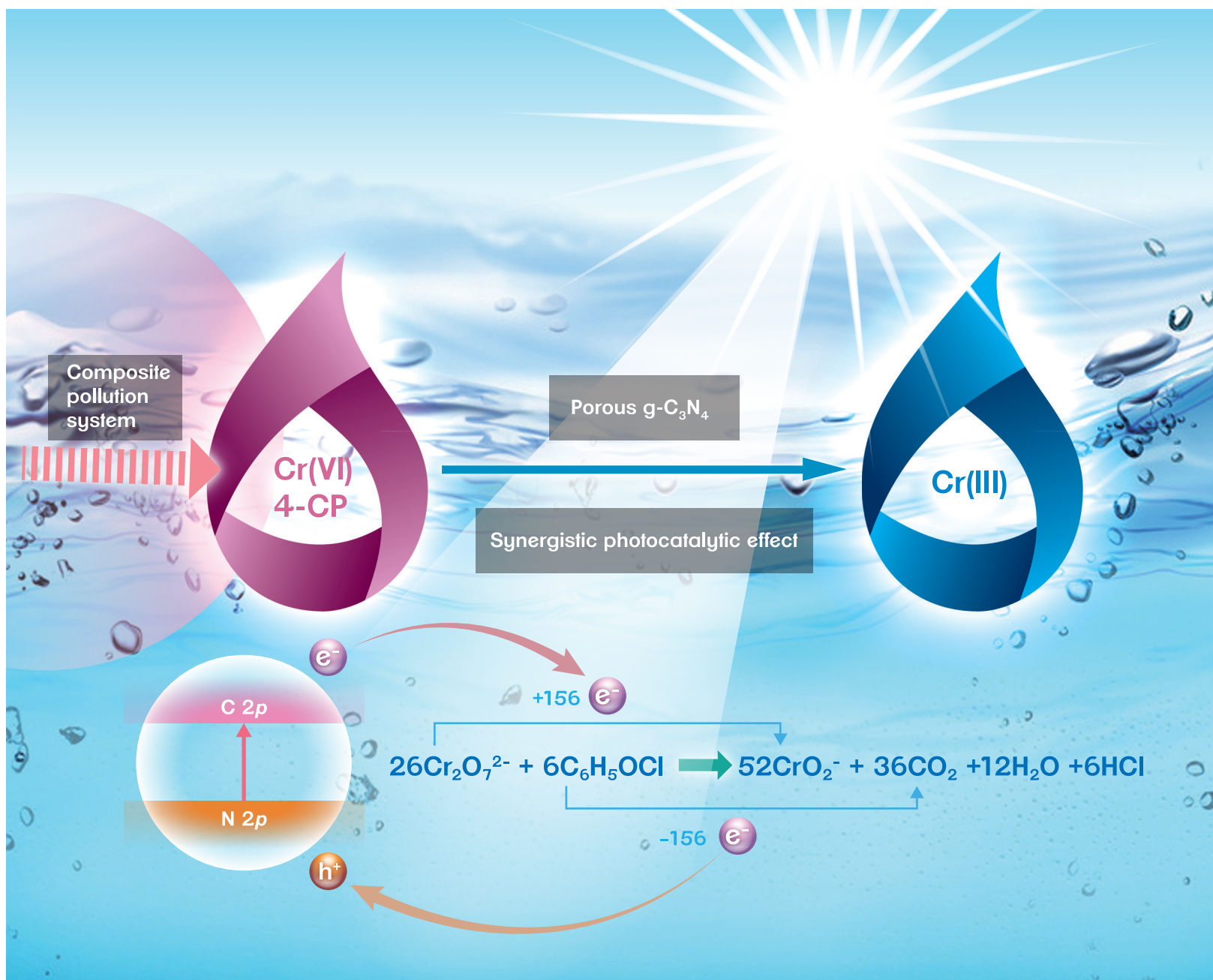




# Chinese Journal of Catalysis

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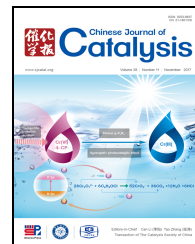
Editors-in-Chief Can Li (李灿) Tao Zhang (张涛)  
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## Chinese Journal of Catalysis

### Graphical Contents

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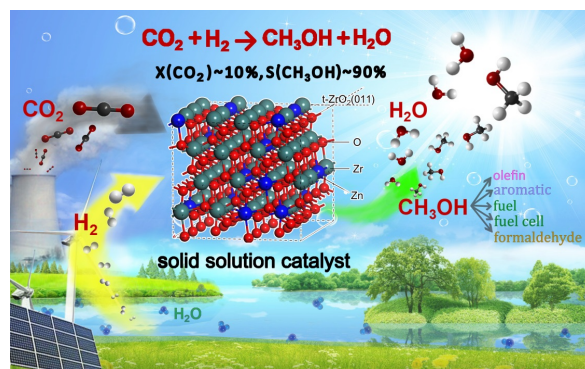
*Chin. J. Catal.*, 2017, 38: 1781–1783 doi: 10.1016/S1872-2067(17)62966-8

##### ZnO-ZrO<sub>2</sub> solid solution catalyst for highly selective hydrogenation of CO<sub>2</sub> to methanol

Tao Zhang \*

State Key Laboratory of Catalysis, iChEM, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China

ZnO-ZrO<sub>2</sub> solid solution catalyze CO<sub>2</sub> hydrogenation to methanol with 10% CO<sub>2</sub> conversion and 90% methanol selectivity by utilizing renewable energy resources.



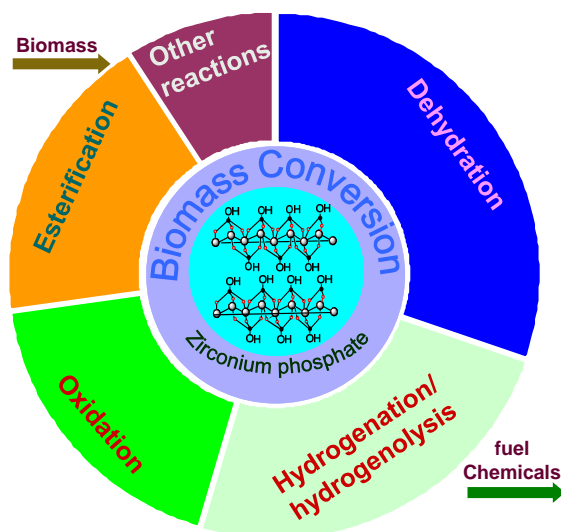
#### Perspective

*Chin. J. Catal.*, 2017, 38: 1784–1793 doi: 10.1016/S1872-2067(17)62908-5

##### Conversion of biomass to chemicals over zirconium phosphate-based catalysts

Difan Li, Wenxiu Ni, Zhenshan Hou \*

East China University of Science and Technology



This perspective illustrates recent applications of zirconium phosphates as stable catalysts for the transformation of biomass-derived platform molecules, the prospects and challenges in this area.

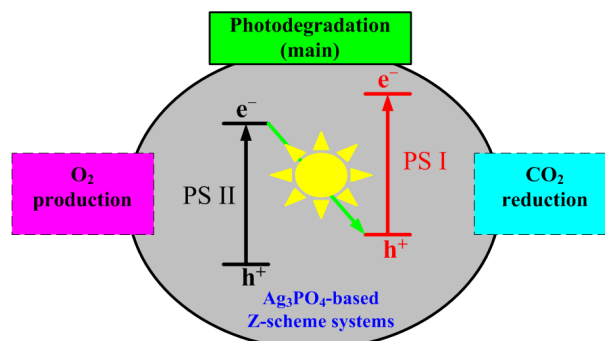
## Minireview

*Chin. J. Catal.*, 2017, 38: 1794–1803 doi: 10.1016/S1872-2067(17)62905-X

### Recent progress in $\text{Ag}_3\text{PO}_4$ -based all-solid-state Z-scheme photocatalytic systems

Ming Ge \*, Zhenlu Li  
North China University of Science and Technology

This brief review summarizes recent research progress in  $\text{Ag}_3\text{PO}_4$ -based all-solid-state Z-scheme photocatalytic systems and discusses their challenges and future development prospects.



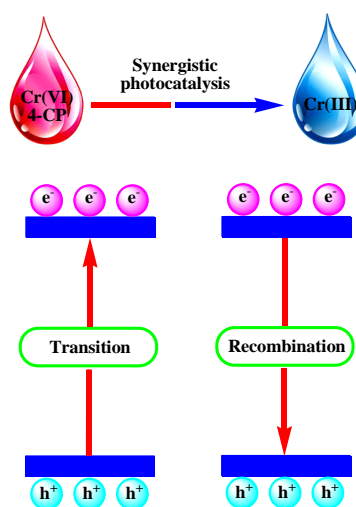
## Articles

*Chin. J. Catal.*, 2017, 38: 1804–1811 doi: 10.1016/S1872-2067(17)62912-7

### Synergistic photocatalytic effect of porous g- $\text{C}_3\text{N}_4$ in a $\text{Cr(VI)}$ /4-chlorophenol composite pollution system

Kai Wei, Kexin Li \*, Zhenxing Zeng, Yuhua Dai \*, Liushui Yan,  
Huiqin Guo, Xubiao Luo  
Nanchang Hangkong University

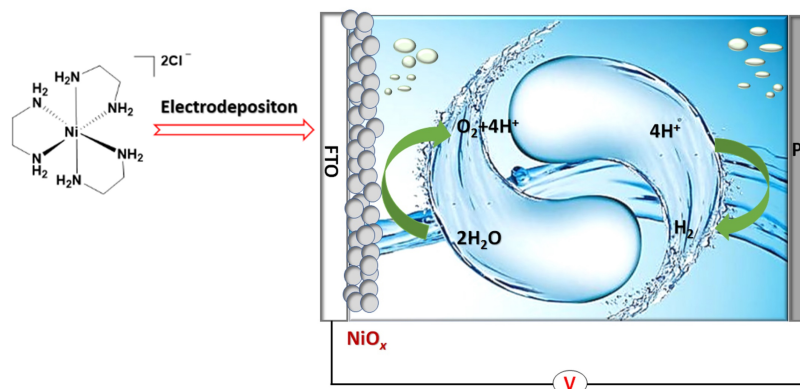
The synergistic photocatalytic effect of pg- $\text{C}_3\text{N}_4$  was studied under different pH conditions. The  $\text{Cr(VI)}$  reduction and 4-CP degradation efficiencies were both improved compared with their respective single-component photocatalytic systems. This synergistic photocatalytic effect was attributed to the accelerated redox reaction between  $\text{Cr}_2\text{O}_7^{2-}$  and 4-CP due to electron transfer with pg- $\text{C}_3\text{N}_4$ .



*Chin. J. Catal.*, 2017, 38: 1812–1817 doi: 10.1016/S1872-2067(17)62921-8

### Electrocatalytic water oxidation by a nickel oxide film derived from a molecular precursor

Fei Li \*, Hua Li, Yong Zhu, Jian Du, Yong Wang, Licheng Sun  
Dalian University of Technology, China; KTH Royal Institute of Technology, Sweden

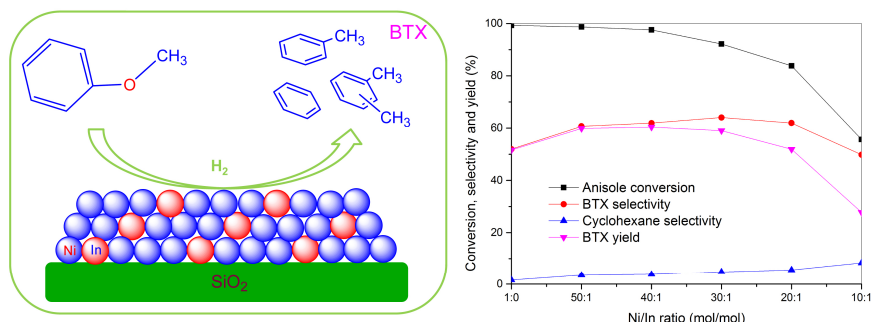


A  $\text{NiO}_x$  film was prepared by electrodeposition of a nickel-based molecular precursor at pH = 11. The thin film exhibits high activity for electrochemical water oxidation.

*Chin. J. Catal.*, 2017, 38: 1818–1830 doi: 10.1016/S1872-2067(17)62910-3

### Effects of indium on Ni/SiO<sub>2</sub> catalytic performance in hydrodeoxygenation of anisole as model bio-oil compound: Suppression of benzene ring hydrogenation and C–C bond hydrogenolysis

Xiaofei Wang, Jixiang Chen\*  
Tianjin University

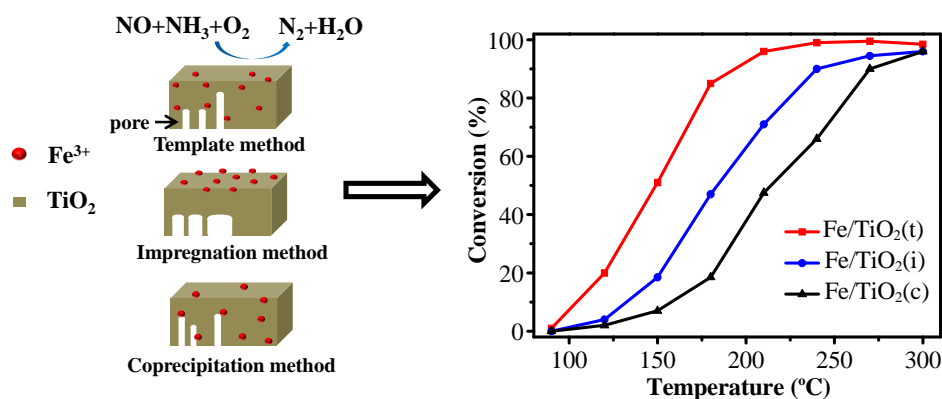


In the hydrodeoxygenation of anisole, used as a bio-oil model compound, the activities of Ni-In/SiO<sub>2</sub> bimetallic catalysts in benzene ring hydrogenation and C–C bond hydrogenolysis were much lower than that of Ni/SiO<sub>2</sub>, leading to higher selectivities for BTX and cyclohexane.

*Chin. J. Catal.*, 2017, 38: 1831–1841 doi: 10.1016/S1872-2067(17)62897-3

### In situ preparation of mesoporous Fe/TiO<sub>2</sub> catalyst using Pluronic F127-assisted sol-gel process for mid-temperature NH<sub>3</sub> selective catalytic reduction

Yulin Li, Xiaojin Han, Yaqin Hou, Yaoping Guo, Yongjin Liu, Ning Xiang, Yan Cui, Zhanggen Huang\*  
Institute of Coal Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences

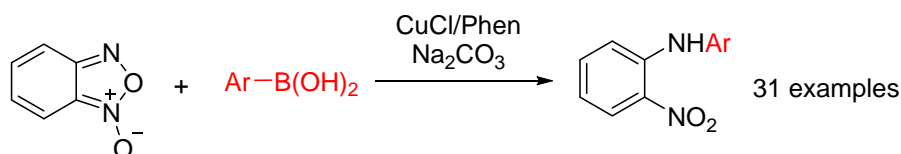


The Fe-TiO<sub>2</sub> catalyst synthesized by a F127-assisted process showed the uniform mesopore structure, the strong interaction between Fe and Ti, and the excellent SCR activity in mid-temperature region with the comparison of catalysts prepared by traditional impregnation and coprecipitation methods.

*Chin. J. Catal.*, 2017, 38: 1842–1850 doi: 10.1016/S1872-2067(17)62914-0

### Copper-catalyzed amination of phenylboronic acids with benzofurazan 1-oxides

Manman Wang, Yunnyun Li, Fen Wang\*, Xingwei Li\*  
Henan Normal University; Dalian Institute of Chemical Physics, Chinese Academy of Sciences



CuCl/Phen can catalyze the C–N coupling between arylboronic acid and benzofurazan 1-oxide. This reaction occurred under mild and redox-neutral conditions with benzofurazan 1-oxide as an aminating reagent via ring scission, leading to a bifunctionalized aminonitrobenzene.

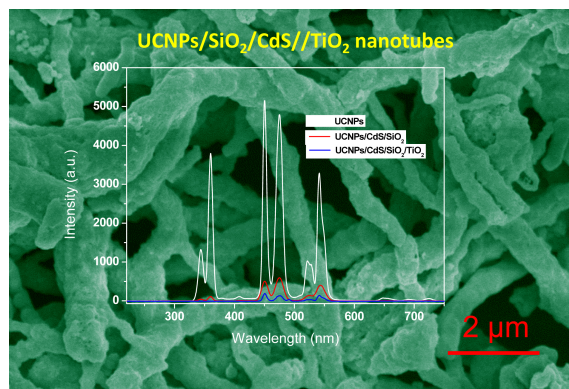


*Chin. J. Catal.*, 2017, 38: 1851–1859 doi: 10.1016/S1872-2067(17)62929-2

### TiO<sub>2</sub> composite nanotubes embedded with CdS and upconversion nanoparticles for near infrared light driven photocatalysis

Wanni Wang, Fu Zhang, Chuanling Zhang, Yang Wang, Wei Tao \*, Sheng Cheng \*, Haisheng Qian \*  
Hefei University of Technology

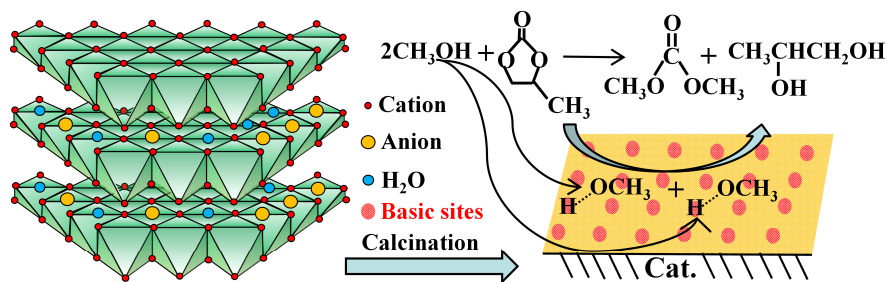
TiO<sub>2</sub> nanotubes embedded with a high proportion of NaYF<sub>4</sub>:Yb/Tm@NaYF<sub>4</sub>:Yb/Er upconversion nanoparticles and CdS nanoparticles are prepared using a colloidal solution method and electrospinning, and show excellent fluorescence energy transfer efficiency and photocatalytic performance.



*Chin. J. Catal.*, 2017, 38: 1860–1869 doi: 10.1016/S1872-2067(17)62898-5

### Solid base catalysts derived from Ca-M-Al (M = Mg, La, Ce, Y) layered double hydroxides for dimethyl carbonate synthesis by transesterification of methanol with propylene carbonate

Yunhui Liao, Feng Li \*, Xin Dai, Ning Zhao, Fukui Xiao \*  
Institute of Coal Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences;  
National Engineering Research Center for Coal-Based Synthesis

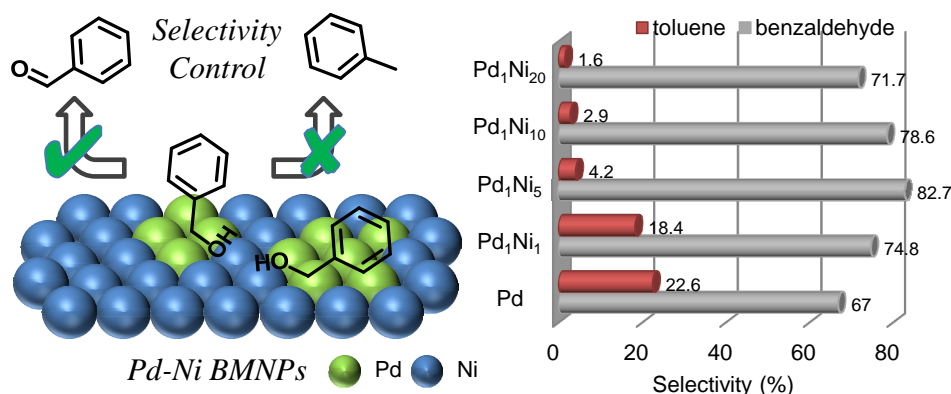


Solid base catalysts derived from Ca-M-Al (M = Mg, La, Ce, Y) layered double hydroxides were found to be both recyclable and highly active during dimethyl carbonate production under heterogeneous conditions.

*Chin. J. Catal.*, 2017, 38: 1870–1879 doi: 10.1016/S1872-2067(17)62904-8

### Selective suppression of toluene formation in solvent-free benzyl alcohol oxidation using supported Pd-Ni bimetallic nanoparticles

Jianwei Che, Mengjia Hao, Wuzhong Yi, Hisayoshi Kobayashi, Yuheng Zhou, Liping Xiao, Jie Fan \*  
Zhejiang University, China; Kyoto Institute of Technology, Japan

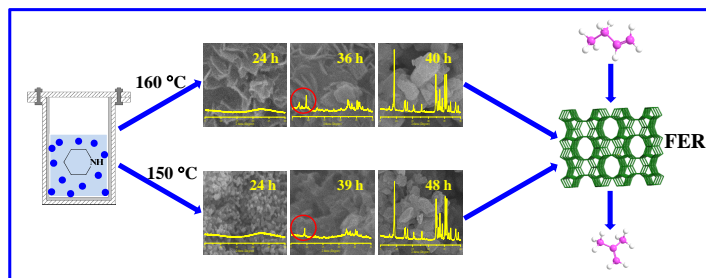


Supported Pd-Ni bimetallic nanoparticles prepared through a solid-state alloying method can enhance the selectivity towards benzaldehyde by effective suppression of toluene formation in a solvent-free benzyl alcohol oxidation reaction.

*Chin. J. Catal.*, 2017, 38: 1880–1887 doi: 10.1016/S1872-2067(17)62906-1

### Synthesis of FER zeolite with piperidine as structure-directing agent and its catalytic application

Weifeng Chu, Fucun Chen, Ce Guo, Xiuji Li \*, Xiangxue Zhu, Yang Gao, Sujuan Xie, Shenglin Liu, Nan Jiang, Longya Xu \*  
*Dalian Institute of Chemical Physics, Chinese Academy of Sciences;*  
*University of Chinese Academy of Sciences;*  
*Nanjing Rongxin Chemical Co., Ltd.*

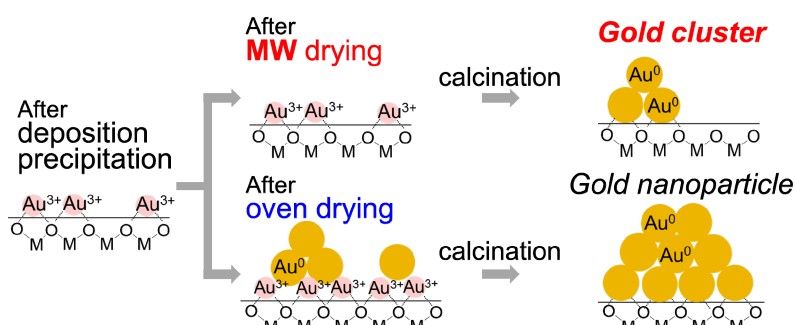


The crystallization behavior of FER zeolite is closely related to the crystallization temperature, with well-crystallized FER zeolite showing good catalytic performance in 1-butene skeletal isomerization.

*Chin. J. Catal.*, 2017, 38: 1888–1898 doi: 10.1016/S1872-2067(17)62909-7

### Preparation of gold clusters on metal oxides by deposition-precipitation with microwave drying and their catalytic performance for CO and sulfide oxidation

Ayako Taketoshi, Tamao Ishida, Hironori Ohashi, Tetsuo Honma, Masatake Haruta \*  
*Tokyo Metropolitan University, Japan;*  
*Fukushima University, Japan;*  
*Japan Synchrotron Radiation Research Institute (JASRI), Japan;*  
*Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China*



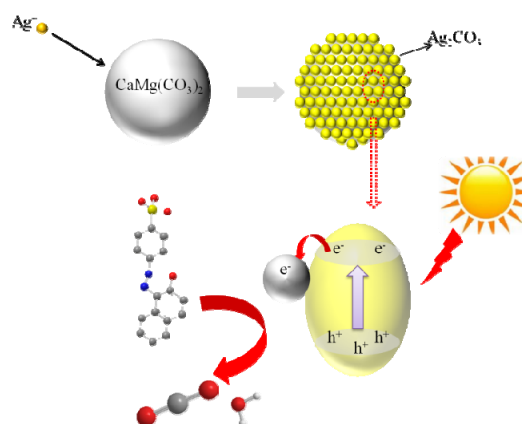
Small gold nanoparticles and clusters could be deposited on metal oxides by deposition-precipitation followed by microwave drying and calcination. The MW drying can be applied to several metal oxides regardless of the MW absorption efficiency.

*Chin. J. Catal.*, 2017, 38: 1899–1908 doi: 10.1016/S1872-2067(17)62924-3

### Low-cost and efficient visible-light-driven $\text{CaMg}(\text{CO}_3)_2@ \text{Ag}_2\text{CO}_3$ microspheres fabricated via an ion exchange route

Jian Tian, Zhen Wu, Zhen Liu, Changlin Yu \*, Kai Yang, Lihua Zhu, Weiya Huang, Yang Zhou  
*Jiangxi University of Science and Technology; Wuyi University;*  
*Fuzhou University*

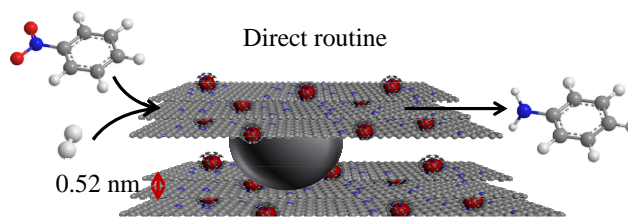
Core-shell like  $\text{CaMg}(\text{CO}_3)_2@ \text{Ag}_2\text{CO}_3$  composite microspheres with low content of  $\text{Ag}_2\text{CO}_3$  were prepared via a facile ion exchange route, the existence of  $\text{CaMg}(\text{CO}_3)_2$  cores could largely promote the separation of photogenerated electrons and holes, leading to high photocatalytic activity and stability.



*Chin. J. Catal.*, 2017, 38: 1909–1917 doi: 10.1016/S1872-2067(17)62917-6

### Carbon film encapsulated Fe<sub>2</sub>O<sub>3</sub>: An efficient catalyst for hydrogenation of nitroarenes

Yingyu Wang, Juanjuan Shi, Zihao Zhang, Jie Fu, Xiuyang Lü, Zhaoyin Hou\*  
Zhejiang University

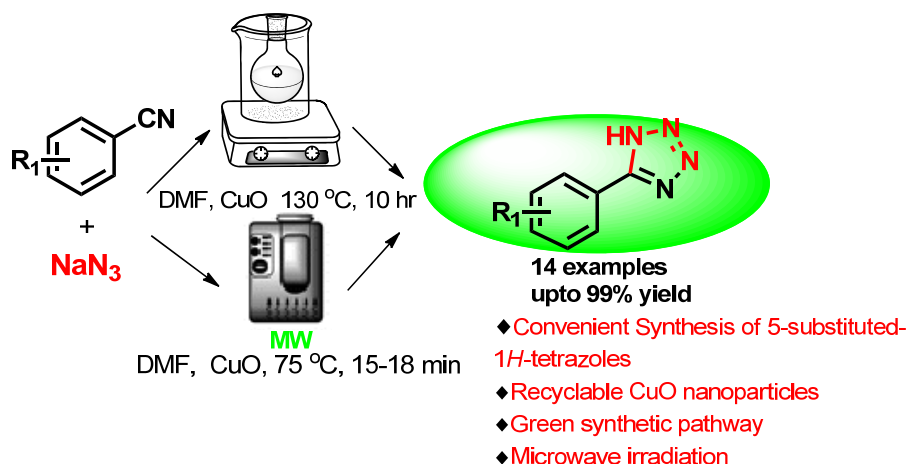


Carbon film encapsulated Fe<sub>2</sub>O<sub>3</sub> nanoparticles embedded in plate carbon (Fe<sub>2</sub>O<sub>3</sub>@G-C) were prepared *via in situ* pyrolysis. Fe<sub>2</sub>O<sub>3</sub>@G-C prepared at 900 °C was highly active and stable for the direct selective hydrogenation of nitroarenes to anilines.

*Chin. J. Catal.*, 2017, 38: 1918–1924 doi: 10.1016/S1872-2067(17)62920-6

### Environmentally friendly, microwave-assisted synthesis of 5-substituted 1*H*-tetrazoles by recyclable CuO nanoparticles via (3+2) cycloaddition of nitriles and NaN<sub>3</sub>

R. D. Padmaja, Sourav Rej, Kaushik Chanda\*  
VIT University, India; Institute of Bioengineering and Nanotechnology, Singapore



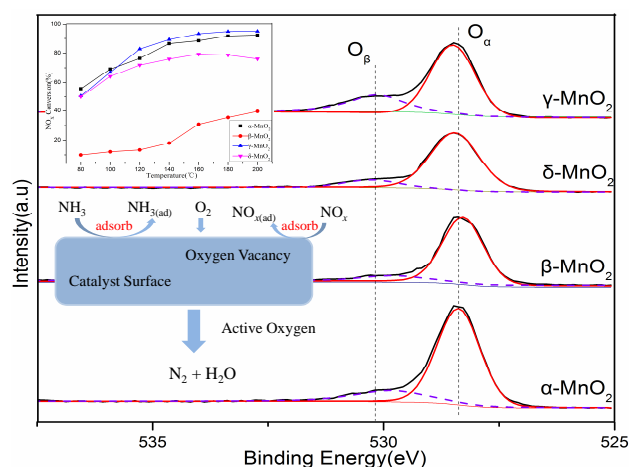
We demonstrate that practical, simple, efficient and recyclable CuO nanoparticles can catalyze the (3+2) cycloaddition of nitriles and NaN<sub>3</sub> to synthesize 5-substituted-1*H*-tetrazoles using microwave irradiation.

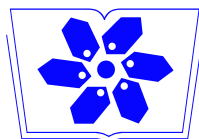
*Chin. J. Catal.*, 2017, 38: 1925–1934 doi: 10.1016/S1872-2067(17)62922-X

### Effects of surface physicochemical properties on NH<sub>3</sub>-SCR activity of MnO<sub>2</sub> catalysts with different crystal structures

Pijun Gong, Junlin Xie, De Fang, Da Han, Feng He\*, Fengxiang Li, Kai Qi  
Wuhan University of Technology

Surface-active oxygen can promote activation of gas molecules and reaction on γ-MnO<sub>2</sub> and α-MnO<sub>2</sub>, giving both catalysts good catalytic activities. High specific surface area and reduction ability also contribute to catalytic activity.





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