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# 催化学报

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主编 林励吾

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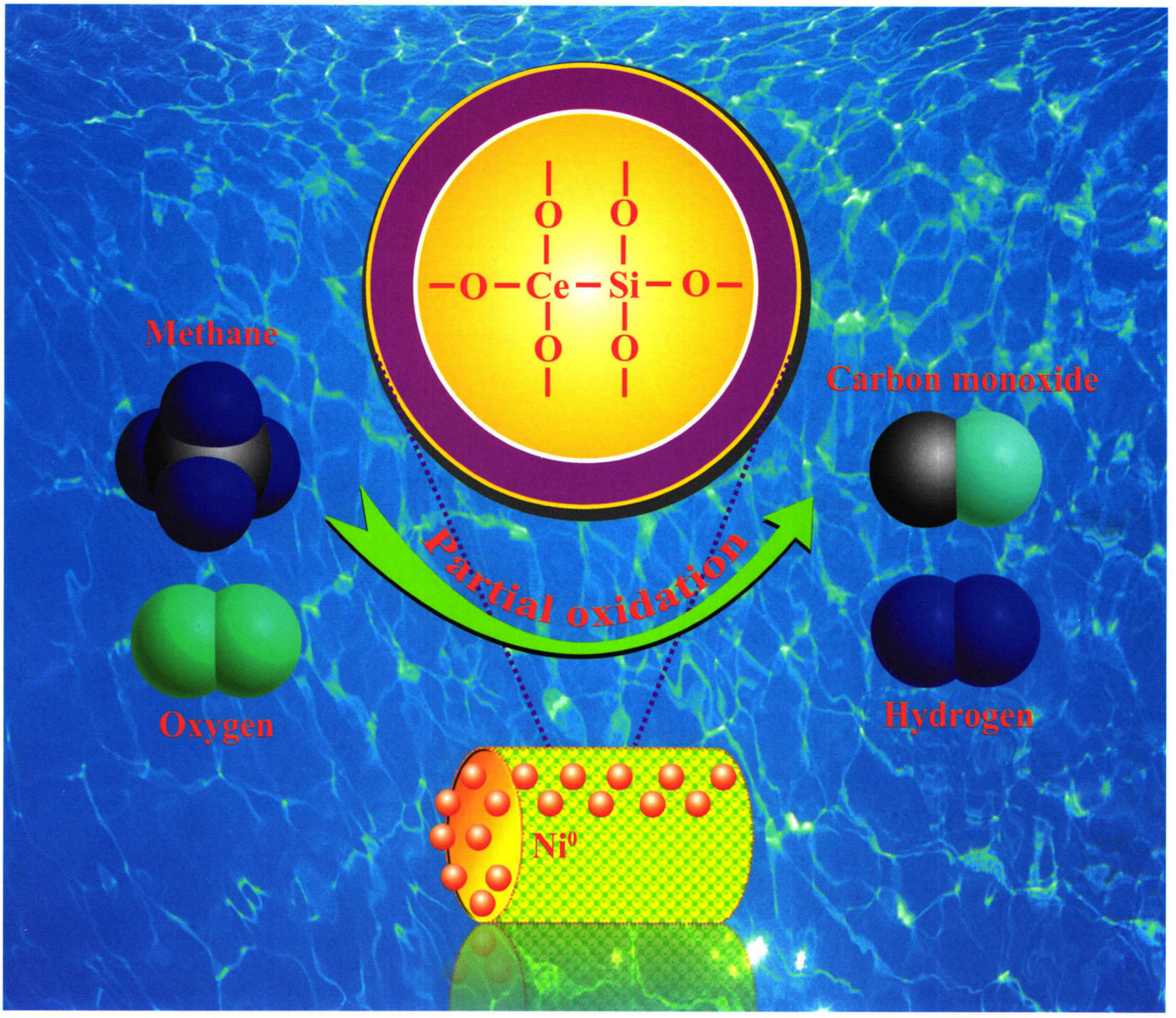


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# 催化学报
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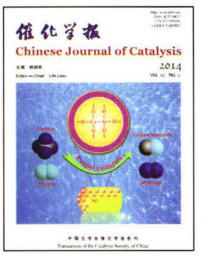


# Chinese Journal of Catalysis

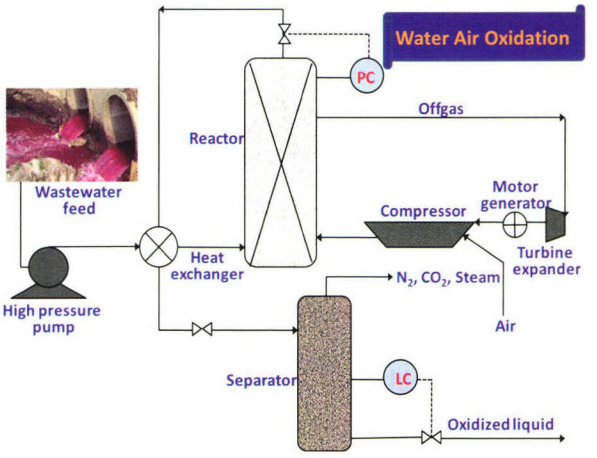
## Graphical Contents

## Review

*Chin. J. Catal.*, 2014, 35: 1–7 doi: 10.1016/S1872-2067(12)60724-4

**Wet air oxidation for the decolorization of dye wastewater: An overview of the last two decades**

Jie Fu, George Z. Kyzas*
*Auburn University, USA; Technological Educational Institute of Kavala, Greece; Aristotle University of Thessaloniki, Greece*



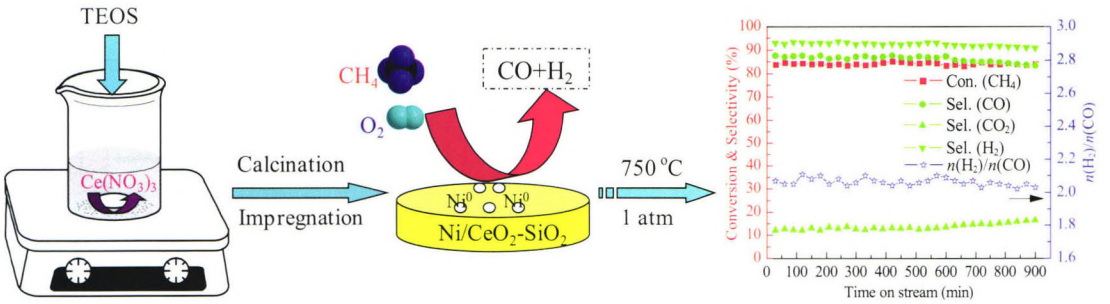

Wet air oxidation (WAO) is one of the most economically and technologically viable advanced oxidation processes for dye wastewater. The wide studies on WAO of dye wastewater began from 1995. Recent studies focused on real wastewaters.

## Articles

*Chin. J. Catal.*, 2014, 35: 8–20 doi: 10.1016/S1872-2067(12)60723-2

**Preparation and characterization of Ni/$CeO_2$-$SiO_2$ catalysts and their performance in catalytic partial oxidation of methane to syngas**

Jiubiao Hu, Changlin Yu*, Yadong Bi*, Longfu Wei, Jianchai Chen, Xirong Chen
*Jiangxi University of Science and Technology; Tianjin University of Technology*

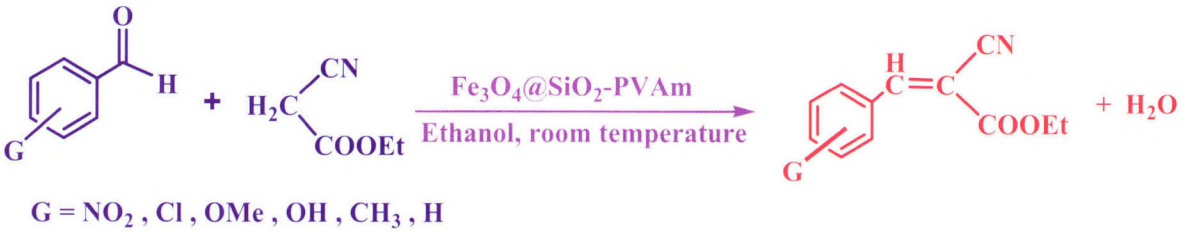



A catalyst consisting of Ni (10%) loaded on a $CeO_2$-$SiO_2$ composite support synthesized using a sol-gel process exhibited high performance in the catalytic partial oxidation of methane to syngas, as a result of its large BET surface area, weak acidity, high dispersion, easy of Ni reduction, and low carbon deposition.

*Chin. J. Catal.*, 2014, 35: 21–27 doi: 10.1016/S1872-2067(12)60685-8

**Polyvinyl amine coated $Fe_3O_4$@$SiO_2$ magnetic microspheres for Knoevenagel condensation**

Farzad Zamani*, Elham Izadi
*Islamic Azad University, Iran; Isfahan University of Technology, Iran*

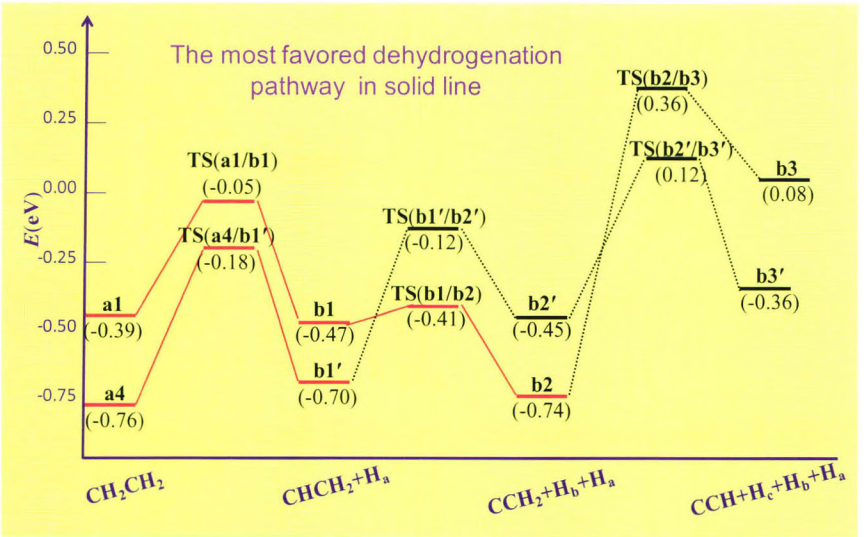



Polyvinyl amine coated $Fe_3O_4$@$SiO_2$ was prepared by a simple method. This new magnetic catalyst exhibited high catalytic activity in Knoevenagel condensation of various aromatic and aliphatic aldehydes under mild conditions along with excellent level of reusability.

*Chin. J. Catal.*, 2014, 35: 28–37 doi: 10.1016/S1872-2067(12)60703-7

**Density functional theory study of the adsorption and reaction of $C_2H_4$ on $Fe_3C$(100)**

Bingyin Wang, Xiaohu Yu, Chunfan Huo*, Jianguo Wang, Yongwang Li
*Institute of Coal Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Synfuels China Co. Ltd*

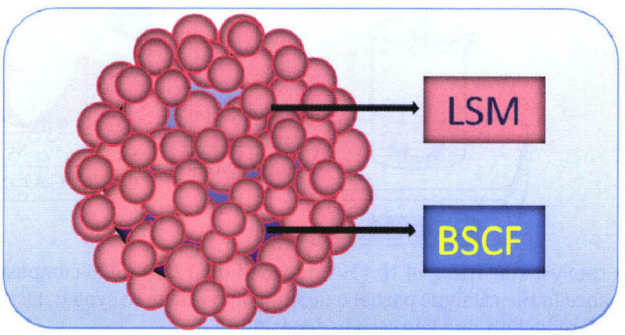



DFT calculations indicate that on $Fe_3C$(100), $C_2H_4$ favors dehydrogenation reaction, while the C–C cleavage is not competitive. Vinylidene ($CCH_2$) and vinyl ($CHCH_2$) are the most abundant.

*Chin. J. Catal.*, 2014, 35: 38–42 doi: 10.1016/S1872-2067(12)60704-9

**High performance $La_{0.8}Sr_{0.2}MnO_3$-coated $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_3$ cathode prepared by a novel solid-solution method for intermediate temperature solid oxide fuel cells**

Li Meng, Fangzhong Wang, Ao Wang, Jian Pu, Bo Chi, Jian Li*
*Huazhong University of Science and Technology*

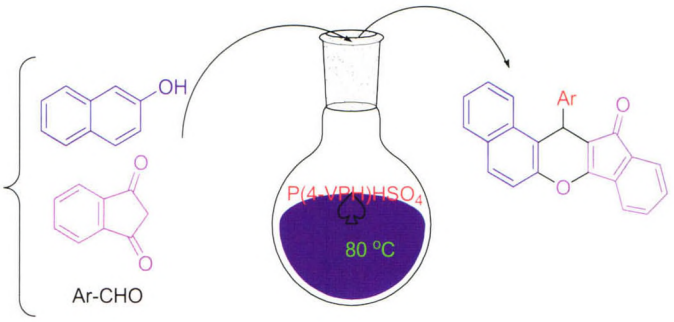



$La_{0.8}Sr_{0.2}MnO_3$(LSM)-coated $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_3$ (BSCF) composite powder (LSM-BSCF) synthesized by a novel solid-solution method, exhibited an extended triple phase boundary, reduced LSM polarization resistance, and stabilized microstructure as of the cathode .

*Chin. J. Catal.*, 2014, 35: 43–48 doi: 10.1016/S1872-2067(12)60707-4

**Poly(4-vinylpyridinium)hydrogen sulfate: A novel and efficient catalyst for the synthesis of 13-aryl-indeno[1,2-*b*]naphtha[1,2-*e*]pyran-12(13*H*)-ones under solvent-free conditions**

Majid Ghashang, Syed Sheik Mansoor*, Krishnamoorthy Aswin
*Najafabad Branch, Islamic Azad University, Iran; C. Abdul Hakeem College, India*



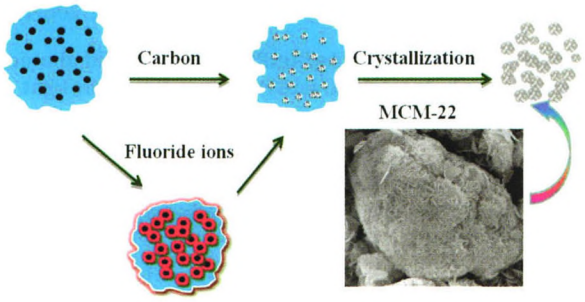

A simple and efficient method for the synthesis of 13-aryl-indeno[1,2-*b*] naphtha[1,2-*e*]pyran-12(13*H*)-ones has been developed that proceeds via a one-pot three-component sequential reaction involving an aromatic aldehyde, *β*-naphthol, and 2*H*-indene-1,3-dione under solvent-free conditions catalyzed by poly(4-vinylpyridinium)hydrogen sulfate (P(4-VPH)$HSO_4$).

*Chin. J. Catal.*, 2014, 35: 49–57 doi: 10.1016/S1872-2067(12)60711-6

**Synthesis and catalytic performance of hierarchical MCM-22 zeolite aggregates with the assistance of carbon particles and fluoride ions**

Jianhua Yang*, Jun Chu, Jinqu Wang, Dehong Yin, Jinming Lu, Yan Zhang
*Dalian University of Technology*

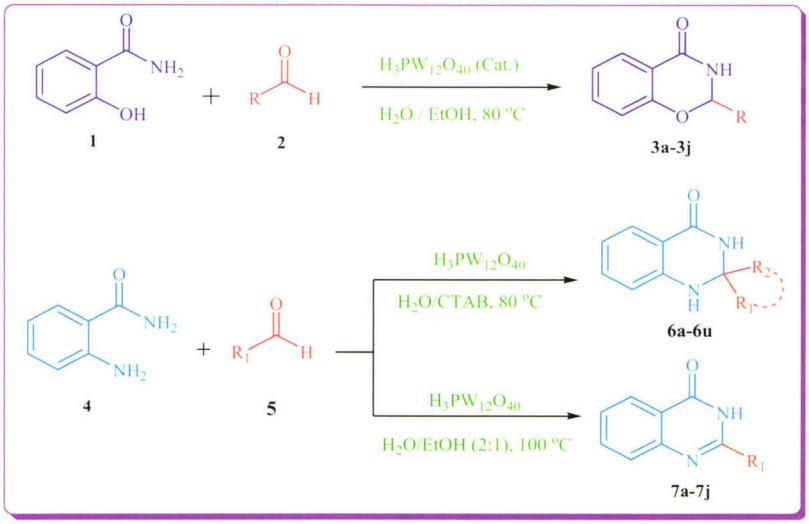
Hierarchical MCM-22 zeolite aggregates constructed by intergrown and stacked thin MCM-22 lamellas were prepared by one-pot hydrothermal synthesis with the assistance of carbon particles and fluoride ions. The Mo/MCM-22-FC catalyst exhibited an improved benzene yield and aromatic selectivity as well as catalyst life in the methane dehydroaromatization reaction.




*Chin. J. Catal.*, 2014, 35: 58–65 doi: 10.1016/S1872-2067(12)60706-2

**$H_3PW_{12}O_{40}$ catalyzed synthesis of benzoxazine and quinazoline in aqueous media**

Mahmood Tajbakhsh*, Rahman Hosseinzadeh, Parizad Rezaee, Mahgol Tajbakhsh
*University of Mazandaran, Iran*

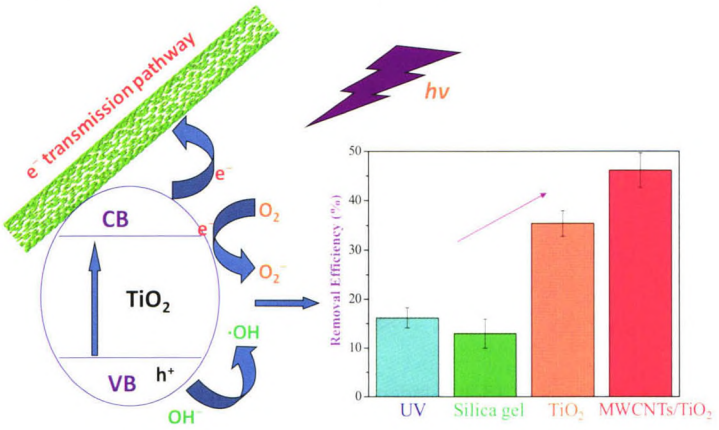



$H_3PW_{12}O_{40}$ was used as an efficient catalyst for the preparation of benzoxazine and quinazoline ring systems in aqueous media. Advantages include high yields, short reaction times, easy work-up, and green procedure.

*Chin. J. Catal.*, 2014, 35: 66–77 doi: 10.1016/S1872-2067(12)60705-0

**Photocatalytic removal of nitric oxide by multi-walled carbon nanotubes-supported $TiO_2$**

Hao Liu, Hairu Zhang, Hongmin Yang*
*Nanjing Normal University; Design Institute of Nanjing Shengnuo Heat Pipe Co., Ltd*

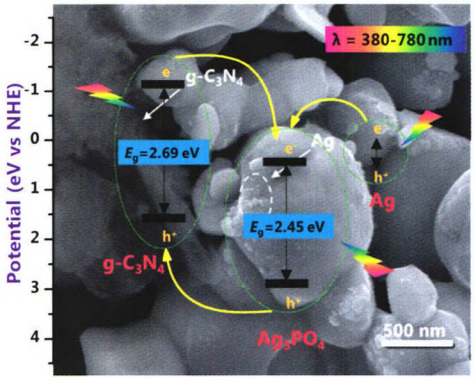



MWCNTs provide another transfer pathway for photogenerated electrons, assisting in electron and hole separation. This electron-scavenging character of MWCNTs causes MWCNTs/$TiO_2$ to perform better in photocatalytic denitration than bare $TiO_2$.

*Chin. J. Catal.*, 2014, 35: 78–84 doi: 10.1016/S1872-2067(12)60712-8

**Preparation of ternary Ag/$Ag_3PO_4$/g-$C_3N_4$ hybrid photocatalysts and their enhanced photocatalytic activity driven by visible light**

Kai Shen*, Mohammed Ashraf Gondal*, Rashid Ghulam Siddique, Shan Shi, Siqi Wang, Jiangbo Sun, Qingyu Xu
*Nanjing University of Aeronautics and Astronautics, China;*
*King Fahd University of Petroleum and Minerals, Saudi Arabia;*
*Southeast University, China*

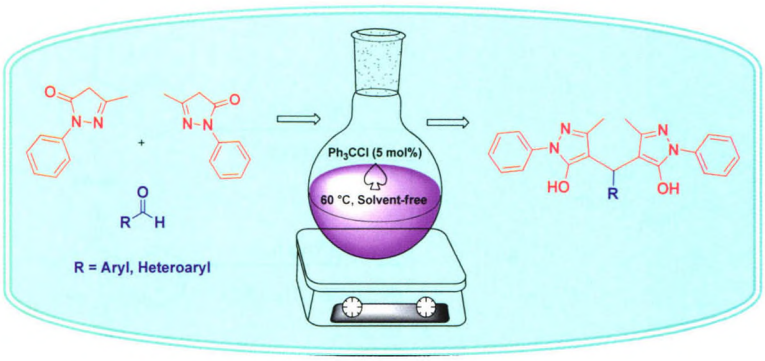



Ternary Ag/$Ag_3PO_4$/g-$C_3N_4$ photocatalyst exhibits excellent photocatalytic activity driven by visible light, attributed to surface plasmon resonance of 40 nm-silver nanoparticles formed on the surface of $Ag_3PO_4$, and the heterojunction at the interface between $Ag_3PO_4$ and g-$C_3N_4$.

*Chin. J. Catal.*, 2014, 35: 85–89 doi: 10.1016/S1872-2067(12)60728-1

**In situ generation of trityl carbocation ($Ph_3C^+$) as a homogeneous organocatalyst for the efficient synthesis of 4,4'-(arylmethylene)-bis(3-methyl-1-phenyl-1*H*-pyrazol-5-ol)s**

Abdolkarim Zare*, Maria Merajoddin, Ahmad Reza Moosavi-Zare, Mahmoud Zarei
*Payame Noor University, Iran; University of Sayyed Jamaleddin Asadabadi, Iran; Bu-Ali Sina University, Iran*

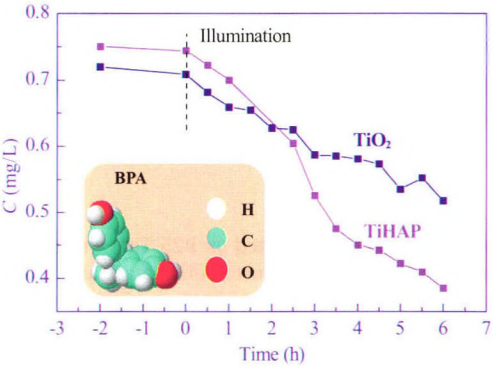



Efficient synthesis of 4,4'-(arylmethylene)-bis(3-methyl-1-phenyl-1*H*- pyrazol-5-ol)s from 3-methyl-1-phenyl-1*H*-pyrazol-5(4*H*)-one and arylaldehydes using $Ph_3CCl$ under solvent-free conditions is described. A plausible reaction mechanism for the process based on the experimental data and that from similar literature studies is proposed.

*Chin. J. Catal.*, 2014, 35: 90–98 doi: 10.1016/S1872-2067(12)60709-8

**Photocatalytic degradation of bisphenol A using Ti-substituted hydroxyapatite**

Qian Li, Xiang Feng, Xiao Zhang, Han Song, Jianwei Zhang, Jing Shang *, Weiling Sun, Tong Zhu, Masato Wakamura, Mineharu Tsukada, Yingliang Lu
*Peking University, China;*
*Fujitsu Laboratories Limited, Japan;*
*Fujitsu Research and Development Center, China*

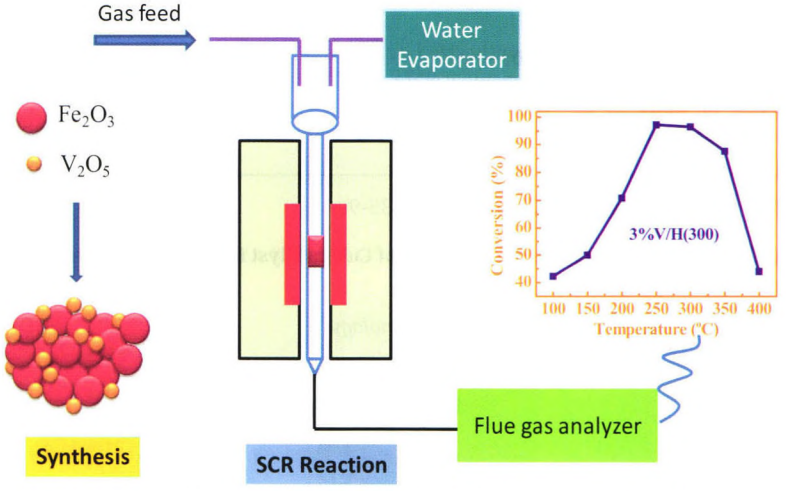



TiHAP film showed an enhanced photocatalytic activity than P25 $TiO_2$ film for degradation of bisphenol (BPA), an important kind of environmental endocrine disrupting chemicals.

*Chin. J. Catal.*, 2014, 35: 99–107 doi: 10.1016/S1872-2067(12)60719-0

**$V_2O_5$/hematite catalysts for low temperature selective catalytic reduction of $NO_x$ with $NH_3$**

Ping Zhang, Tianhu Chen *, Xuehua Zou, Chengzhu Zhu, Dong Chen, Haibo Liu
*Hefei University of Technology*

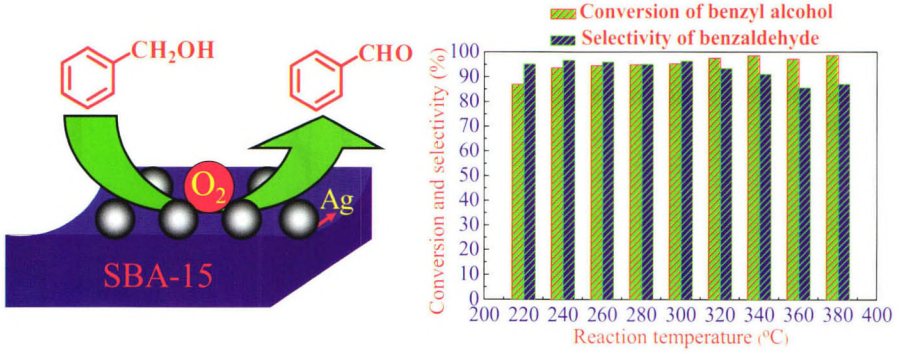



A series of highly dispensed $V_2O_5$/hematite (V/H) catalysts were prepared by the impregnation of $V_2O_5$ on goethite, which were highly efficient for the selective catalytic reduction of NO with $NH_3$.

*Chin. J. Catal.*, 2014, 35: 108–119 doi: 10.1016/S1872-2067(12)60720-7

**Catalytic activity of Ag/SBA-15 for low-temperature gas-phase selective oxidation of benzyl alcohol to benzaldehyde**

Liang Ma, lihua Jia *, Xiangfeng Guo *, Lijun Xiang
*Qiqihar University*

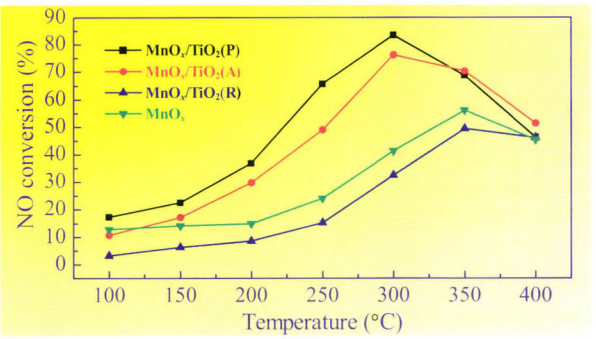



Ag/SBA-15 catalyst for the gas-phase selective oxidation of benzyl alcohol to benzaldehyde with $O_2$ was prepared using an impregnation method. Ag/SBA-15 displayed good catalytic activity at low temperature and excellent thermal gradient stability.

*Chin. J. Catal.*, 2014, 35: 120–126 doi: 10.1016/S1872-2067(12)60726-8

**Influence of the $TiO_2$ crystalline phase of $MnO_x/TiO_2$ catalysts for NO oxidation**

Zhongyi An, Yuqun Zhuo *, Chao Xu, Changhe Chen
*Tsinghua University*

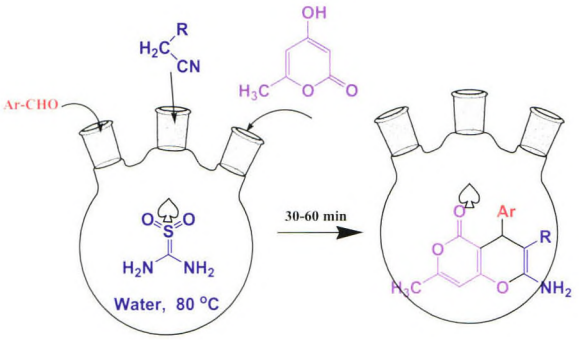



Mn-based catalyst supported on P25 $TiO_2$ was more active for NO oxidation than those supported on anatase and rutile $TiO_2$, achieving 83% of NO conversion at 300 °C and 20000 $h^{-1}$ of GHSV.

*Chin. J. Catal.*, 2014, 35: 127–133 doi: 10.1016/S1872-2067(12)60727-X

**Thiourea dioxide: An efficient and reusable organocatalyst for the rapid one-pot synthesis of pyrano[4,3-*b*]pyran derivatives in water**

Majid Ghashang, Syed Sheik Mansoor*, Krishnamoorthy Aswin
*Islamic Azad University, Iran;*
*C. Abdul Hakeem College, India*

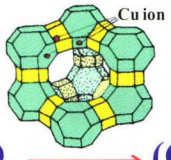



A series of pyrano[4,3-*b*]pyran derivatives have been synthesized by the reaction of aromatic aldehydes with malononitrile or cyanoacetate and 4-hydroxy-6-methylpyran-2-one in water at 80 °C using an aqueous solution of thiourea dioxide as a catalyst in excellent yields.

*Chin. J. Catal.*, 2014, 35: 134–139 doi: 10.1016/S1872-2067(12)60735-9

**Surface reaction of $CuCl_2$ and HY zeolite during the preparation of CuY catalyst for the oxidative carbonylation of methanol**

Ruiyu Wang, Zhong Li *
*China University of Mining and Technology; Taiyuan University of Technology*



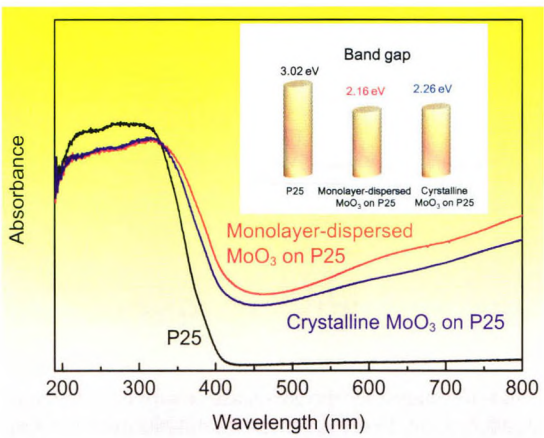

$$CH_3OH + CO + O_2 \longrightarrow (CH_3O)_2CO + H_2O$$

A Cu/Y($CuCl_2$) catalyst was prepared by heating a combination of $CuCl_2$ and HY zeolite, and exhibited higher catalytic activity for the oxidative carbonylation of methanol compared with a conventional Cu/Y catalyst generated by heating a mixture of CuCl and HY zeolite, even though it had lower Cu and Cl contents. In this catalyst, both CuCl and $CuCl_2$ were present on the surface and ion-exchanged $Cu^I$ and low levels of adsorbed CuCl were in the internal Y zeolite cage structure.

*Chin. J. Catal.*, 2014, 35: 140–147 doi: 10.1016/S1872-2067(12)60731-1

**Photocatalytic degradation of methylene blue by $MoO_3$ modified $TiO_2$ under visible light**

Huabo Yang, Xiang Li*, Anjie Wang, Yao Wang, Yongying Chen
*Dalian University of Technology*




Strong interactions between the monolayer-dispersed tetrahedral-coordinated molybdenum oxide species and P25 lead to a decrease in the band gap of P25, and thus an increase in its visible light absorption.

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