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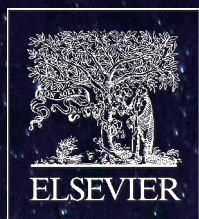
催化学报
CHINESE JOURNAL OF CATALYSIS
May 2016 Vol. 37 No. 5 pages 637-778



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Editors-in-Chief Can Li (李灿) Tao Zhang (张涛)
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In This Issue



Cover: Zhao and coworkers in their Review on pages 644–670 have presented the advances in the tuning of microstructure and surface chemistry as well as their influence on the catalytic performance in the ODH and DDH reactions. It has been pointed out that the modulation of microstructure and surface chemistry is an efficient strategy for manipulating the catalytic performance of carbocatalysts, and the future hot topics towards carbon mediated dehydrogenation of hydrocarbons to olefins have also been proposed.

封面: 赵忠奎等综述了烷烃脱氢制烯烃用碳催化剂微结构和表面化学调控方法和效果的最新研究进展, 指出碳催化材料及碳基整体式催化剂碳活性单元微结构和化学性质的调控是实现其催化性能调控的有效策略, 并对今后碳催化乙苯脱氢制烯烃的研究热点进行了展望. 见本期第 644–670 页.

About the Journal

Chinese Journal of Catalysis is an international journal published monthly by Chinese Chemical Society, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, and Elsevier. The journal publishes original, rigorous, and scholarly contributions in the fields of heterogeneous and homogeneous catalysis in English or in both English and Chinese. The scope of the journal includes:

- ◆ New trends in catalysis for applications in energy production, environmental protection, and production of new materials, petroleum chemicals, and fine chemicals;
- ◆ Scientific foundation for the preparation and activation of catalysts of commercial interest or their representative models;
- ◆ Spectroscopic methods for structural characterization, especially methods for in situ characterization;
- ◆ New theoretical methods of potential practical interest and impact in the science and applications of catalysis and catalytic reaction;
- ◆ Relationship between homogeneous and heterogeneous catalysis;
- ◆ Theoretical studies on the structure and reactivity of catalysts.
- ◆ The journal also accepts contributions dealing with photo-catalysis, bio-catalysis, and surface science and chemical kinetics issues related to catalysis.

Types of Contributions

- **Reviews** deal with topics of current interest in the areas covered by this journal. Reviews are surveys, with entire, systematic, and important information, of recent progress in important topics of catalysis. Rather than an assemblage of detailed information or a complete literature survey, a critically selected treatment of the material is desired. Unsolved problems and possible developments should also be discussed. Authors should have published articles in the field. Reviews should have more than 80 references.
- **Communications** rapidly report studies with significant innovation and major academic value. They are limited to four Journal pages. After publication, their full-text papers can also be submitted to this or other journals.
- **Articles** are original full-text reports on innovative, systematic and completed research on catalysis.
- **Highlights** describe and comment on very important new results in the original research of a third person with a view to highlight their significance. The results should be presented clearly and concisely without the comprehensive details required for an original article.
- **Perspectives** are short reviews of recent developments in an established or developing topical field. The authors should offer a critical assessment of the trend of the field, rather than a summary of literatures.
- **Viewpoints** describe the results of original research in general in some area, with a view to highlighting the progress, analyzing the major problems, and commenting the possible research target and direction in the future.

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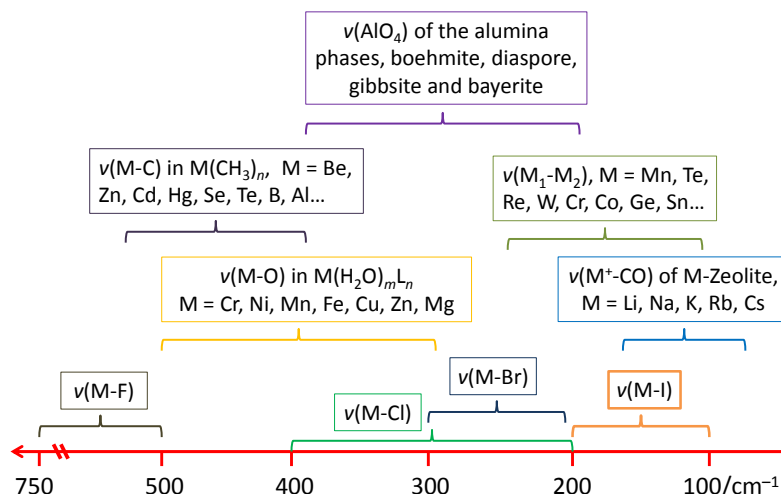
Viewpoint

Chin. J. Catal., 2016, 37: 637–643 doi: 10.1016/S1872-2067(15)61087-7

Far reaching potentials of far infrared spectroscopy in catalysis research

Huixiang Li, Z. Conrad Zhang*

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



Far infrared spectroscopy complements the application of mid-infrared, near-infrared spectroscopy with the advantage of capable of measuring these typical lower energy vibration modes accurately.

Reviews

Chin. J. Catal., 2016, 37: 644–670 doi: 10.1016/S1872-2067(15)61065-8

Modulating the microstructure and surface chemistry of carbocatalysts for oxidative and direct dehydrogenation: A review

Zhongkui Zhao*, Guifang Ge, Weizuo Li, Xinwen Guo, Guiru Wang
Dalian University of Technology

This review presents the state of the art in the manipulating of the microstructure and surface chemistry of carbocatalysts for the oxidative dehydrogenation and direct dehydrogenation of hydrocarbons to olefins.

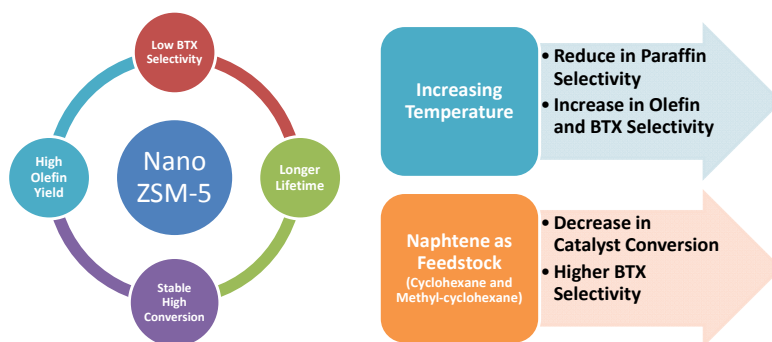


Chin. J. Catal., 2016, 37: 671–680 doi: 10.1016/S1872-2067(15)61091-9

Recent advances in naphtha catalytic cracking by nano ZSM-5: A review

Shayan Miar Alipour*
Amirkabir University of Technology
(Tehran Polytechnic), Iran;
University of New South Wales, Australia

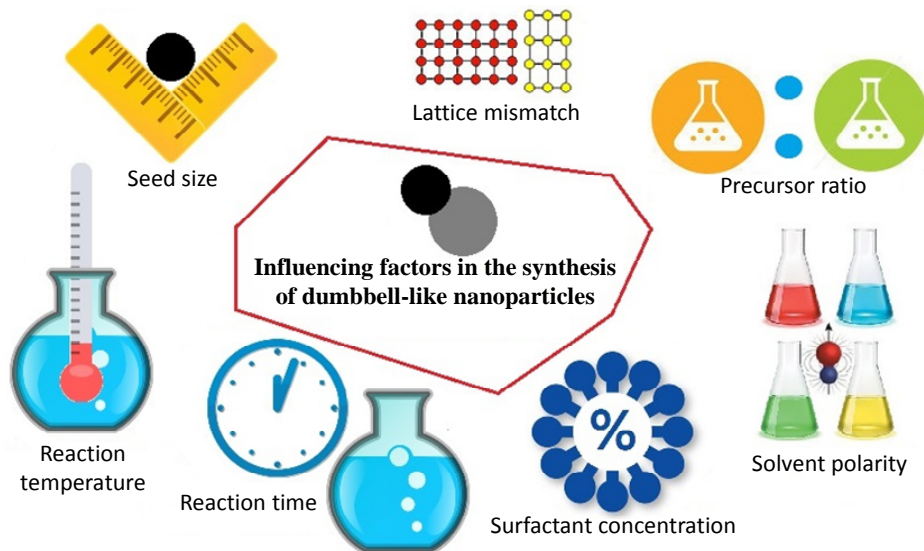
Application of nano ZSM-5 in naphtha catalytic cracking results in better conversion, longer lifetime and higher selectivity for olefins compare to micro ZSM-5. It is also indicated that altering reaction temperature and feedstock can change the conversion and the selectivity of catalyst.



Chin. J. Catal., 2016, 37: 681–691 doi: 10.1016/S1872-2067(15)61069-5

A review of significant factors in the synthesis of hetero-structured dumbbell-like nanoparticles

Qifu Huang, Wenzhi Li*, Qizhao Lin*, Dong Pi, Chao Hu, Chunyu Shao, Haitao Zhang
University of Science and Technology of China



This article reviews some significant factors in the synthesis of dumbbell-like nanoparticles, including seed size and size ratio, reaction temperature and time, solvent polarity, precursor ratio, lattice mismatch, and surfactant concentration.

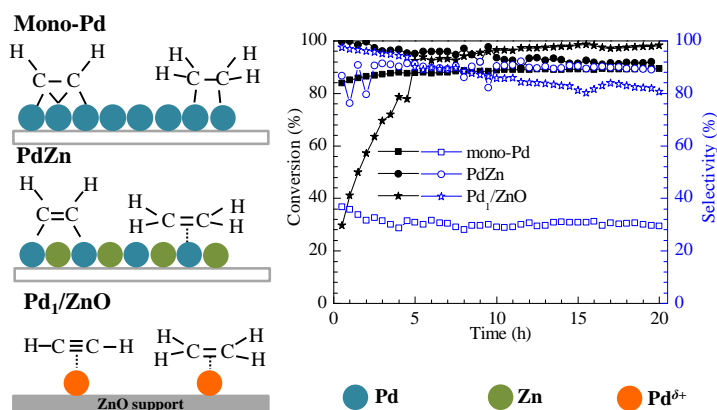
Articles

Chin. J. Catal., 2016, 37: 692–699 doi: 10.1016/S1872-2067(15)61090-7

Pd/ZnO catalysts with different origins for high chemoselectivity in acetylene semi-hydrogenation

Huiran Zhou, Xiaofeng Yang*, Aiqin Wang*, Shu Miao, Xiaoyan Liu, Xiaoli Pan, Yang Su, Lin Li, Yuan Tan, Tao Zhang
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences

A Pd-based single atom catalyst was achieved on a ZnO support, which exhibits excellent catalytic performances with a comparably high chemoselectivity but a different origin to that of PdZn catalysts in acetylene semi-hydrogenation.

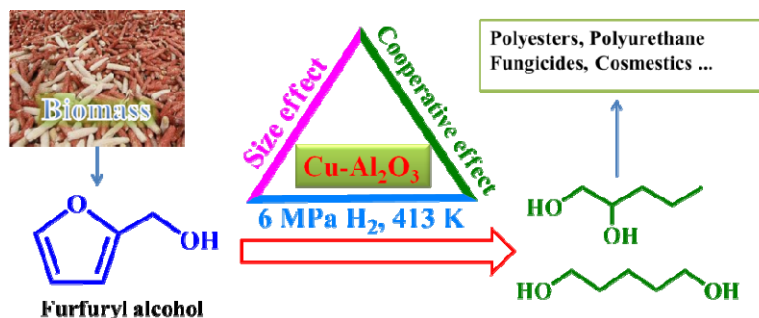


Chin. J. Catal., 2016, 37: 700–710 doi: 10.1016/S1872-2067(15)61080-4

Selective hydrogenolysis of biomass-derived furfuryl alcohol into 1,2- and 1,5-pentanediol over highly dispersed Cu-Al₂O₃ catalysts

Hailong Liu, Zhiwei Huang*, Haixiao Kang, Chungu Xia, Jing Chen*

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

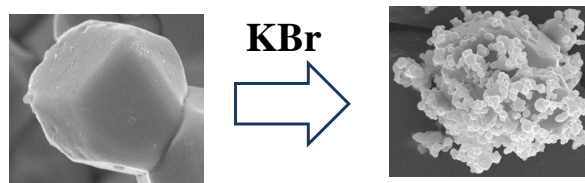


The size and cooperative effects of highly dispersed Cu nanoparticles and an acidic Al₂O₃ support are significant factors affecting the selective hydrogenolysis of furfuryl alcohol to 1,2- and 1,5-pentanediols over Cu-Al₂O₃ catalysts.

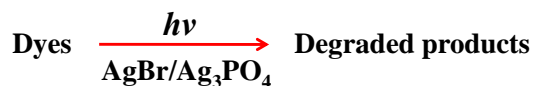
Chin. J. Catal., 2016, 37: 711–719 doi: 10.1016/S1872-2067(15)61078-6

Photocatalytic degradation of dyes by AgBr/Ag₃PO₄ and the ecotoxicities of their degraded products

Pongsaton Amornpitoksuk*, Sumetha Suwanboon
Prince of Songkla University, Thailand



AgBr/Ag₃PO₄ powders were successfully synthesized using a one-pot ion-exchange method and showed promising photocatalytic activity for organic dye degradation under visible light.

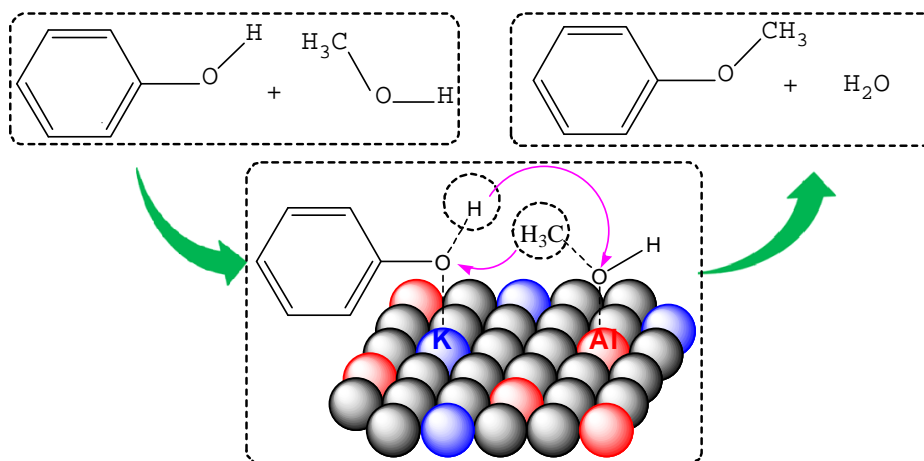


Chin. J. Catal., 2016, 37: 720–726 doi: 10.1016/S1872-2067(15)61074-9

Synthesis of anisole by vapor phase methylation of phenol with methanol over catalysts supported on activated alumina

Dan Dang, Ze Wang*, Weigang Lin, Wenli Song

Institute of Process Engineering, Chinese Academy of Sciences

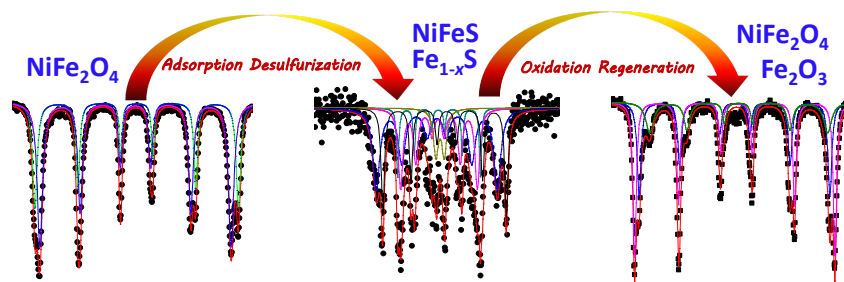


Under catalysis of KH₂PO₄/Al₂O₃, phenol and methanol was activated by K and Al sites respectively. Anisole yield decreased with increasing space velocity, increased with increasing methanol fraction, and appeared a maximum value with increasing temperature.

Chin. J. Catal., 2016, 37: 727–734 doi: 10.1016/S1872-2067(15)61068-3

Mössbauer spectroscopic characterization of ferrites as adsorbents for reactive adsorption desulfurization

Xiao Chen, Kaixin Zhu, M. A. Ahmed, Junhu Wang*, Changhai Liang*
*Dalian University of Technology, China; Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China;
 University of Chinese Academy of Sciences, China; Al Azhar University, Egypt*

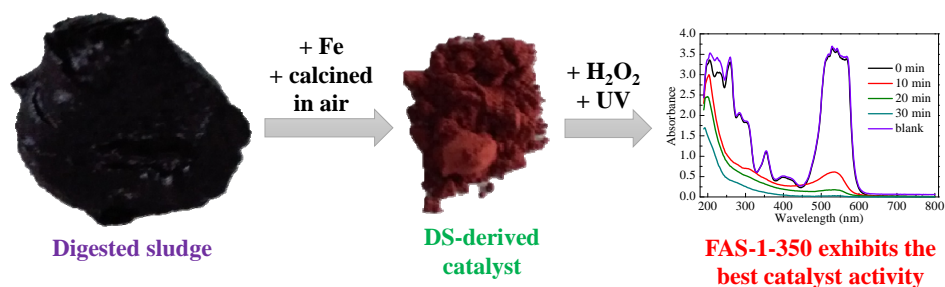


Ferrite adsorbents can be synthesized using a microwave assisted combustion method, yielding a high desulfurization capability. Mössbauer spectroscopy was used to characterize the ferrites. The adsorbents were successfully regenerated under oxidizing conditions.

Chin. J. Catal., 2016, 37: 735–742 doi: 10.1016/S1872-2067(15)61066-X

Optimization of a digested sludge-derived mesoporous material as an efficient and stable heterogeneous catalyst for the photo-Fenton reaction

Shijie Yuan, Nianhua Liao, Bin Dong, Xiaohu Dai*
Tongji University

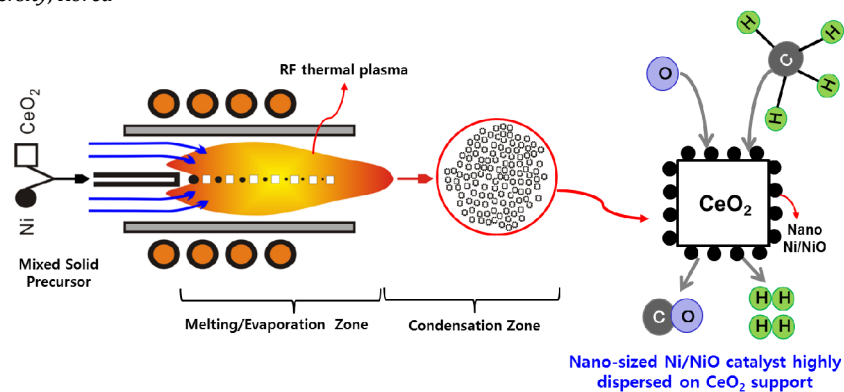


Digested sludge-derived photo-Fenton catalysts were synthesized via a facile three-step method. The catalyst produced using ferrous ammonium sulfate in conjunction with a calcination temperature of 350 °C exhibits the best catalytic activity because of its faster reaction rate and lower Fe leaching.

Chin. J. Catal., 2016, 37: 743–749 doi: 10.1016/S1872-2067(15)61071-3

Synthesis of Ni-CeO₂ catalyst for the partial oxidation of methane using RF thermal plasma

M. Y. Lee, J. S. Nam, J. H. Seo*
Chonbuk National University, Korea

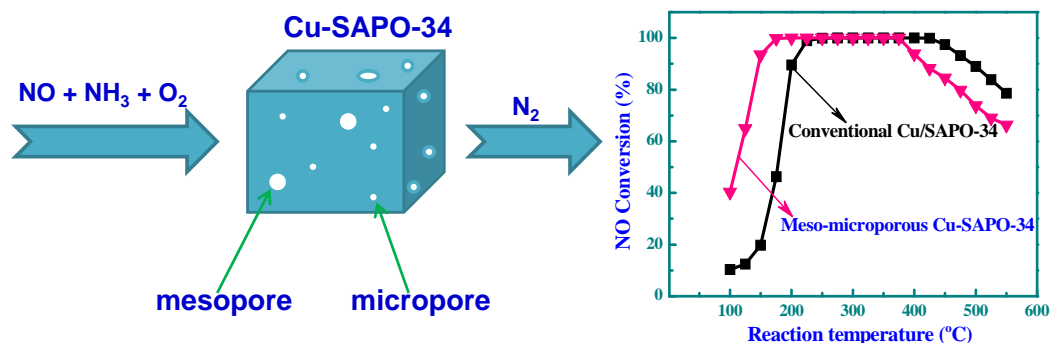


Epoxides were Ni-CeO₂ nano catalyst was prepared by in-flight treatment of Ni and CeO₂ powders in RF thermal plasma. The as-prepared catalyst showed high catalytic activities during the partial oxidation of methane.

Chin. J. Catal., 2016, 37: 750–759 doi: 10.1016/S1872-2067(15)61072-5

Synthesis of a chabazite-supported copper catalyst with full mesopores for selective catalytic reduction of nitrogen oxides at low temperature

Jixing Liu, Jian Liu*, Zhen Zhao, Weiyu Song, Yuechang Wei, Aijun Duan, Guiyuan Jiang
China University of Petroleum-Beijing

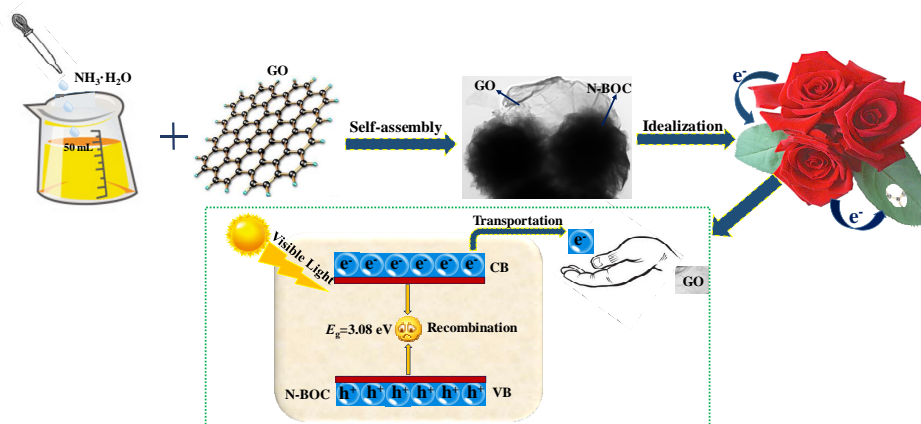


H-Cu-SAPO-34 catalysts with full mesopores and excellent performance in low-temperature NH_3 -SCR of NO have been controllably synthesized via a one-pot hydrothermal crystallization method. Importantly, the formation of micro-mesopores in the Cu-SAPO-34 catalysts decreases diffusion resistance and greatly improves the accessibility of reactants to the catalytic active sites.

Chin. J. Catal., 2016, 37: 760–768 doi: 10.1016/S1872-2067(15)61079-8

Microspheres of graphene oxide coupled to N-doped $\text{Bi}_2\text{O}_2\text{CO}_3$ for visible light photocatalysis

Ruiben Jin*, Xiaojia Jiang, Yangyuan Zhou, Jianfu Zhao
Tongji University

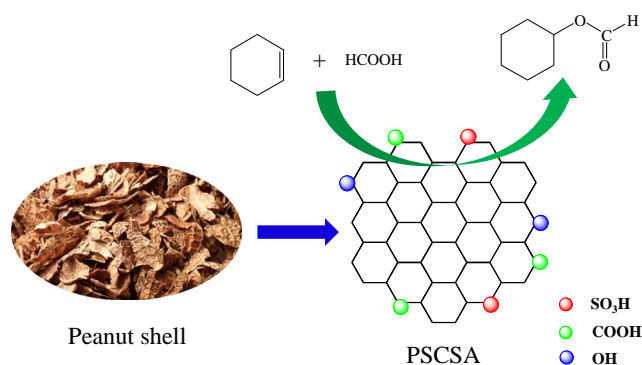


Microspheres of graphene oxide (GO) coupled to N-doped $(\text{BiO})_2\text{CO}_3$ showed improved photocatalytic activity compared to pure BOC and N-BOC, which was due to the high electron-withdrawing ability and conductivity of GO and improved visible light harvesting ability of the 3D hierarchical architecture.

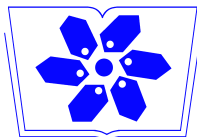
Chin. J. Catal., 2016, 37: 769–777 doi: 10.1016/S1872-2067(15)61076-2

Esterification of cyclohexene with formic acid over a peanut shell-derived carbon solid acid catalyst

Wei Xue, Hepan Zhao, Jie Yao, Fang Li*, Yanji Wang*
Hebei University of Technology



A peanut shell-derived carbon solid acid (PSCSA) gave high cyclohexene conversion with high selectivity and good reusability in the esterification of cyclohexene with formic acid.



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