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Special Issue in Honor of the 90th Birthday of Professor Enze Min

Guest Editors: Mingyuan He (何鸣元), Haichao Liu (刘海超)

中国炼油催化应用科学的奠基人
石油化工技术自主创新的先行者
绿色化学的开拓者



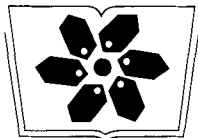
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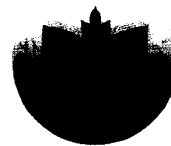
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庆祝闵恩泽院士九十华诞专刊

客座主编: 何鸣元, 刘海超

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相关信息

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272 Impact Factor of *Chinese Journal of Catalysis* increases from 0.752 to 1.171—congratulations and thanks to the authors of our most cited articles

275 作者索引

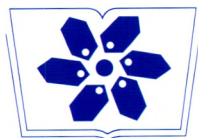
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CHINESE JOURNAL OF CATALYSIS

Monthly Vol. 34 No. 1 January 2013



Special Issue in Honor of the 90th Birthday of Professor Enze Min

Guest Editors: Mingyuan He, Haichao Liu

Graphical Abstract

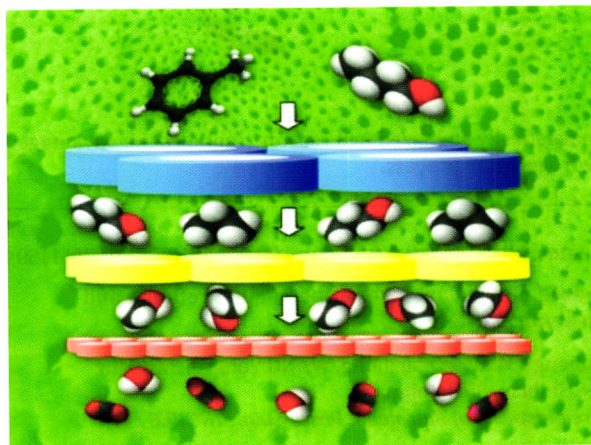
Reviews

Chin. J. Catal., 2013, 34: 22–47 doi: 10.1016/S1872-2067(11)60507-X

Synthesis and applications of hierarchically porous catalysts

LI Xiaoyun, SUN Minghui, ROOKE Joanna Claire,
CHEN Lihua*, SU Bao-Lian*
Wuhan University of Technology, China;
University of Namur (FUNDP), Belgium;
University of Cambridge, UK

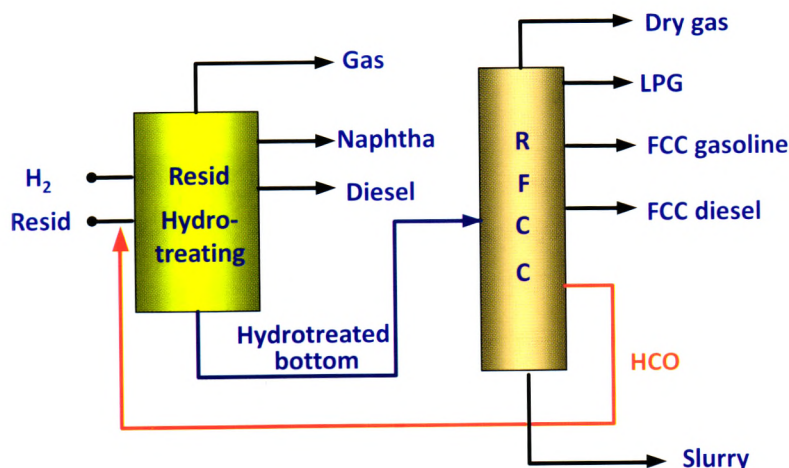
Hierarchically porous catalysts: recent developments with the main focus on the synthesis strategies that are available as well as their application in catalysis.



Chin. J. Catal., 2013, 34: 48–60 doi: 10.1016/S1872-2067(11)60508-1

Some crucial technologies supporting development of petroleum refining industry in the future

LI Dadong*
SINOPEC Research Institute of Petroleum Processing

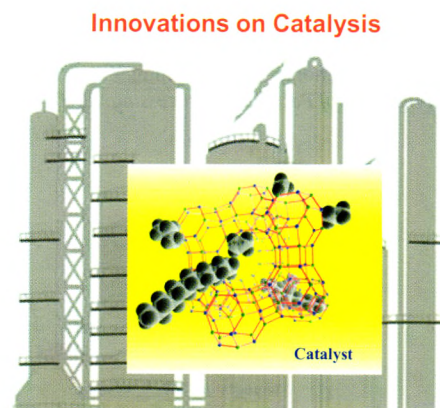


The technologies of efficiently processing heavy oil and producing clean transportation fuel and high-quality chemical raw materials are very crucial support to the future petroleum refining industry. Some technologies with good prospects are cited.

Some innovation ideas and practices on progresses from catalytic directional fundamental research to industrial applications—to celebrate the 90th birthday of Mr. Enze Min

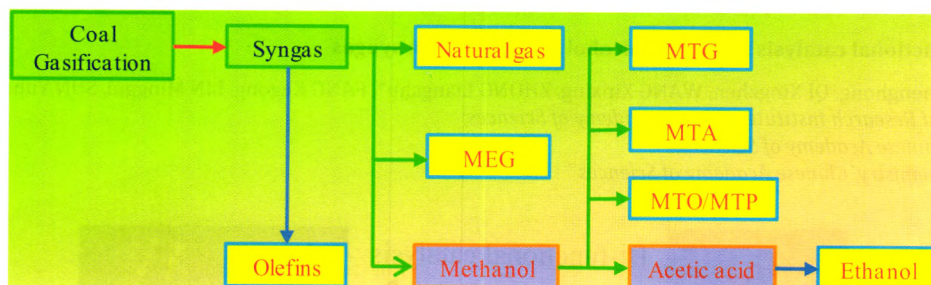
XIE Zaiku*
Sinopec Groups

We summarize some of our innovation ideas and practices on new catalytic materials and new petrochemical technology in recent years under the guidance of Mr. Min's thoughts on innovation.



Recent advances in coal to chemicals technology developed by SINOPEC

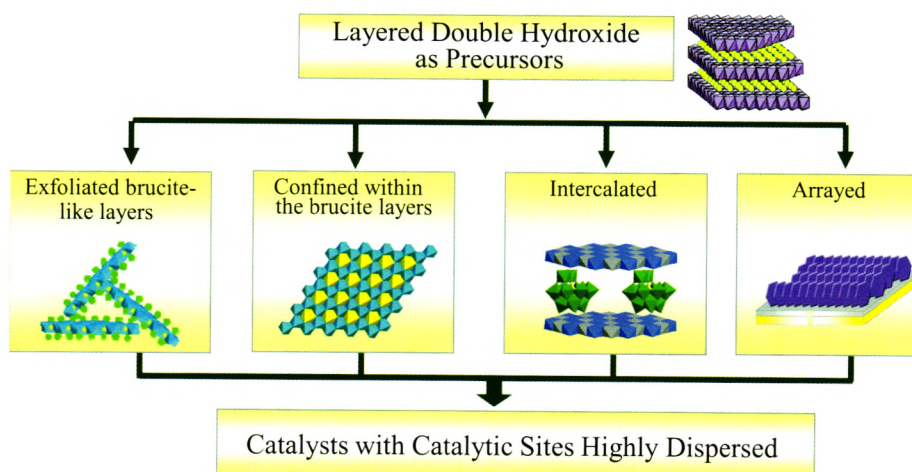
CHEN Qingling*, YANG Weimin, TENG Jiawei
Shanghai Research Institute of Petrochemical Technology, SINOPEC



This review presents the latest advances in coal to chemicals technology developed by SINOPEC, mainly focus on SINOPEC methanol to olefins, SINOPEC methanol to propylene, syngas to ethylene glycol, methanol to xylene, synthetic natural gas process, methanol to aromatics, syngas to olefins and acetic acid hydrogenation technology.

Catalysts with catalytic sites highly dispersed from layered double hydroxide as precursors

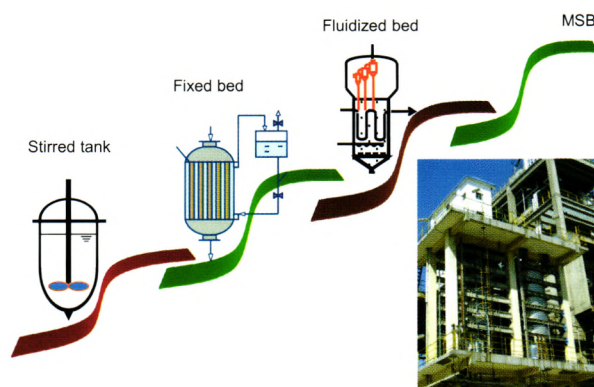
AN Zhe, HE Jing*, DUAN Xue
Beijing University of Chemical Technology



The latest development of layered double hydroxides as precursors for the catalysts with catalytic sites highly dispersed was summarized with 102 references.

Magnetically stabilized bed reactor

ZONG Baoning*, MENG Xiangkun, MU Xuhong, ZHANG Xiaoxin
Research Institute of Petroleum Processing, SINOPEC

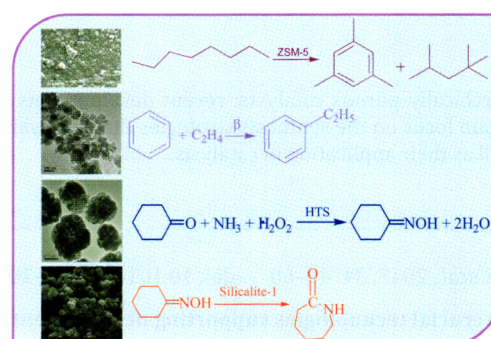


The magnetically stabilized bed reactor combines the advantages of the fixed bed, moving bed and fluidized bed reactors to intensify the hydrogenation process.

Nanosized molecular sieves as petroleum refining and petrochemical catalysts

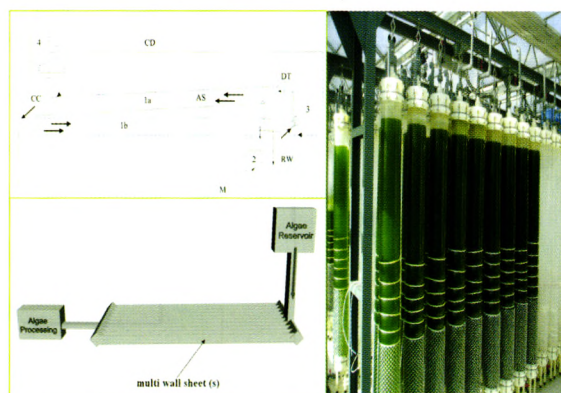
MU Xuhong*, WANG Dianzhong, WANG Yongrui, LIN Min,
CHENG Shibiao, SHU Xingtian
Research Institute of Petroleum Processing, SINOPEC

Nanosized ZSM-5, β , HTS, and silicalite-1 zeolites were synthesized and used, respectively, for straight run gasoline reforming, alkylation of benzene and ethylene, oximation of cyclohexanone, and gas phase Beckmann rearrangement of cyclohexanone oxime. The catalyst lifetimes were prolonged when nanosized molecular sieves were used.



Factors in mass cultivation of microalgae for biodiesel

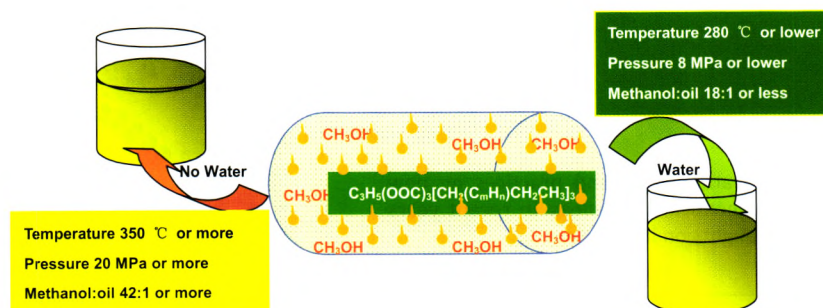
ZHU Junying, RONG Junfeng, ZONG Baoning*
SINOPEC Research Institute of Petroleum Processing



This review presents the factors that influence the mass cultivation of microalgae for biofuels, such as microalgae species/strains, metabolic mechanism, culture conditions and the photobioreactor.

Research and development of a sub-critical methanol alcoholysis process for producing biodiesel using waste oils and fats

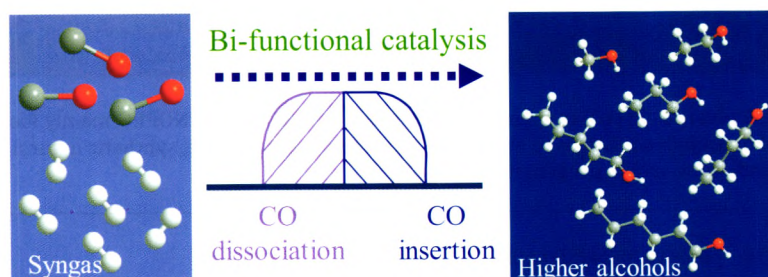
DU Zexue*, TANG Zhong, WANG Haijing, ZENG Jianli, CHEN Yanfeng, MIN Enze
Research Institute of Petroleum Processing, SINOPEC



The presence of water in the sub-critical methanol method catalyzed the alcoholysis reaction of triglycerides, which reduces significantly the severity of the reaction conditions, such as temperature, pressure, and methanol to oil molar ratio.

Advances in bifunctional catalysis for higher alcohol synthesis from syngas

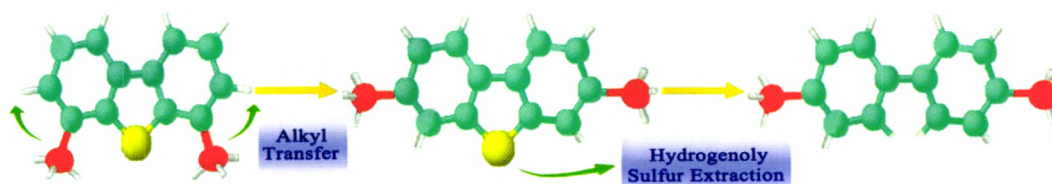
XIAO Kang, BAO Zhenghong, QI Xingzhen, WANG Xinxing, ZHONG Liangshu*, FANG Kegong, LIN Minggui, SUN Yuhan*
Shanghai Advanced Research Institute, Chinese Academy of Sciences;
University of the Chinese Academy of Sciences;
Institute of Coal Chemistry, Chinese Academy of Sciences



Higher alcohol synthesis is a bifunctional catalytic process occurring on a dual site. There is a need to design the dual site on the atomic scale to give high stability in order to improve catalytic performance.

The development and application of catalysts for ultra-deep hydrodesulfurization of diesel

FANG Xiangchen*, GUO Rong, YANG Chengmin
Fushun Research Institute of Petroleum and Petrochemicals, SINOPEC; East China University of Science and Technology



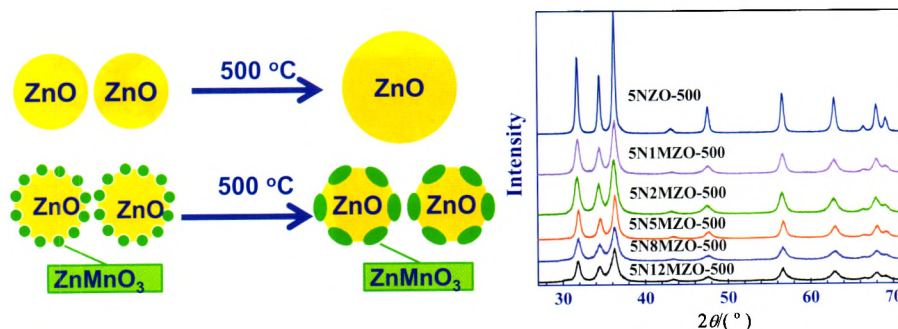
A summary of research efforts related to the design, synthesis, and application of ultra-deep hydrodesulfurization catalysts for diesel fuels is presented. Progress in the field is discussed, including the preparation of novel supports and the development of new techniques for tuning active metal surface properties, improving alkyl transfer performance and increasing the use of stacked catalysts.

Communications

Chin. J. Catal., 2013, 34: 140–145 doi: 10.1016/S1872-2067(11)60513-5

Improvement of adsorptive desulfurization performance of Ni/ZnO adsorbent by doping with Mn additive

ZHANG Yuliang, YANG Yongxing, LIN Feng, YANG Min, LIU Tie feng, JIANG Zongxuan*, LI Can
Dalian Institute of Chemical Physics, Chinese Academy of Sciences;
Graduate University of Chinese Academy of Sciences

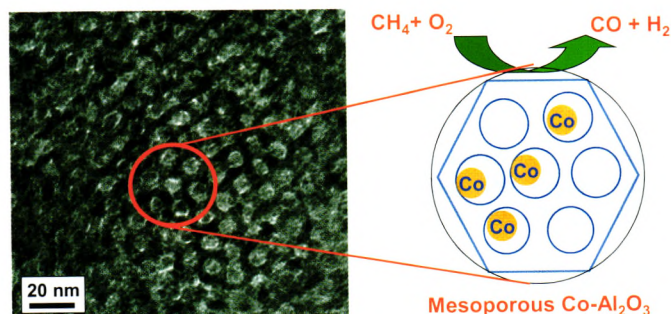


As a result of doping with Mn, the average particle size of ZnO was reduced by formation of ZnMnO₃ at high temperature. The desulfurization performance and regenerability of adsorbents were significantly improved by Mn doping.

Chin. J. Catal., 2013, 34: 146–151 doi: 10.1016/S1872-2067(11)60481-6

Partial oxidation of methane to syngas over mesoporous Co-Al₂O₃ catalysts

LIU Ruiyan, YANG Meihua, HUANG Chuanjing*, WENG Weizheng, WAN Huilin*
Xiamen University



A mesoporous Co-Al₂O₃ catalyst, prepared using one-pot synthesis, showed an ordered hexagonal mesostructure, high dispersion of Co species, and excellent catalytic performance for partial oxidation of methane to synthesis gas.

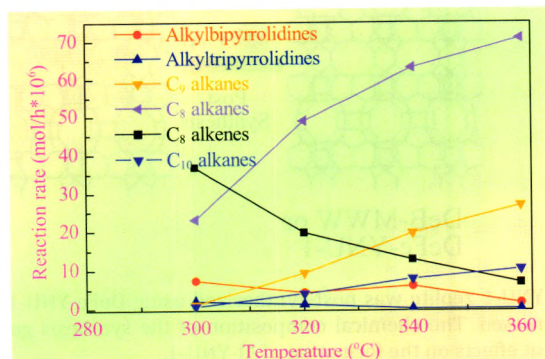
Articles

Chin. J. Catal., 2013, 34: 152–158 doi: 10.1016/S1872-2067(11)60514-7

Hydrodenitrogenation of porphyrin on Ni-Mo based catalysts

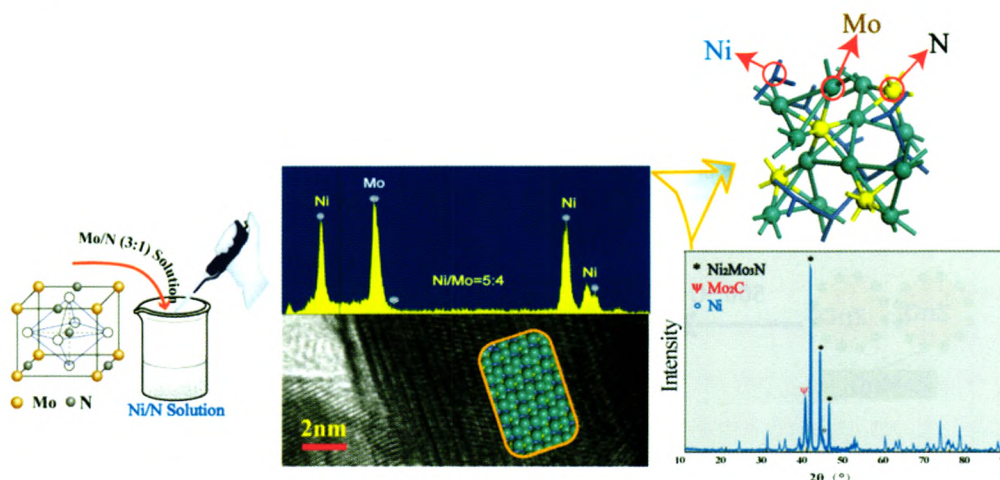
Eika W. QIAN *, Satoshi ABE, Yusaku KAGAWA, Hiroyuki IKEDA
Tokyo University of Agriculture and Technology, Japan;
Nippon Ketjen Co. Ltd., Japan

The hydrodenitrogenation (HDN) of porphyrins was carried out over the phosphorus containing NiMo/Al₂O₃ catalysts using a fixed-bed flow reaction system. A method of quantitative analysis of the porphyrin and its derivatives produced by HDN was established.



Synthesis of Ni/Mo/N catalyst and its application in benzene hydrogenation in the presence of thiophene

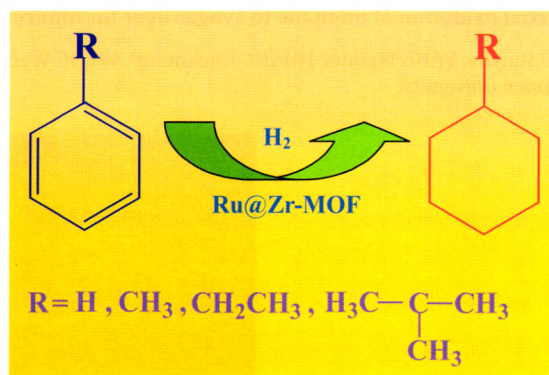
CHU Qi, FENG Jie*, LI Wenying, XIE Kechang
Taiyuan University of Technology



An unsupported Ni/Mo/N interstitial catalyst with high catalytic performance and sulfur tolerance is prepared by the complex decomposition of HMT at 650 °C in one pot synthesis.

Catalytic activity of immobilized Ru nanoparticles in a porous metal-organic framework using supercritical fluid

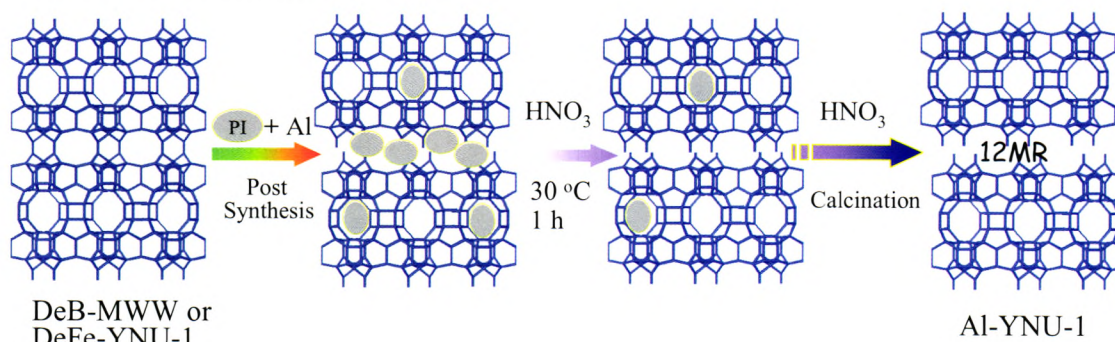
WU Tianbin, ZHANG Peng, MA Jun, FAN Hongleng, WANG Weitao,
JIANG Tao, HAN Buxing*
Institute of Chemistry, Chinese Academy of Sciences



Ru nanoparticles are immobilized in a Zr-based metal-organic framework (MOF) having both micropores and mesopores. The Ru@Zr-MOF catalyst for the hydrogenation of benzene and its derivatives is very active and stable.

Preparation and formation mechanism of Al-YNU-1 using highly acid-treated Fe-YNU-1 molecular sieve as a silica source

WANG Pengfei, LI Junfen, DONG Mei, QIN Zhangfeng, WANG Jianguo, FAN Weibin*
Institute of Coal Chemistry, Chinese Academy of Sciences

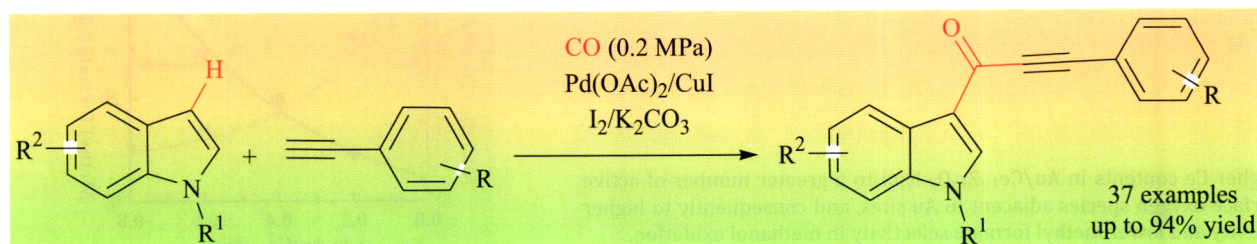


Al-YNU-1 zeolite was post-synthesized using DeFe-YNU-1 as a silica source. In this way, its framework Al content was significantly increased. The chemical composition of the synthesis gel and the acid-treatment conditions of the as-synthesized precursor have great effects on the formation of Al-YNU-1.

Palladium-catalyzed synthesis of indole-3-alkynones via direct carbonylation of indoles

LI Dengfeng, SHAN Shang, SHI Lijun, LANG Rui, XIA Chungu, LI Fuwei*

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

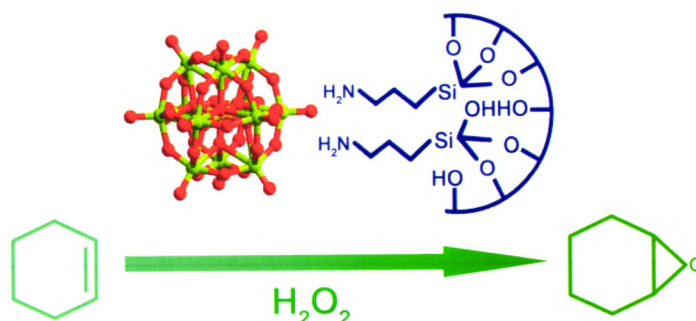


An efficient strategy has been developed for the synthesis of indole-3-alkynones involving sequential oxidative iodination and Pd(0)-catalyzed carbonylation processes. The products could be further applied to the synthesis of triazole derivatives.

Catalytic epoxidation of cyclohexene over mesoporous-silica immobilized Keggin-type tungstophosphoric acid

CAI Wenjia, ZHOU Yan, BAO Renlie, YUE Bin*, HE Heyong*

Fudan University

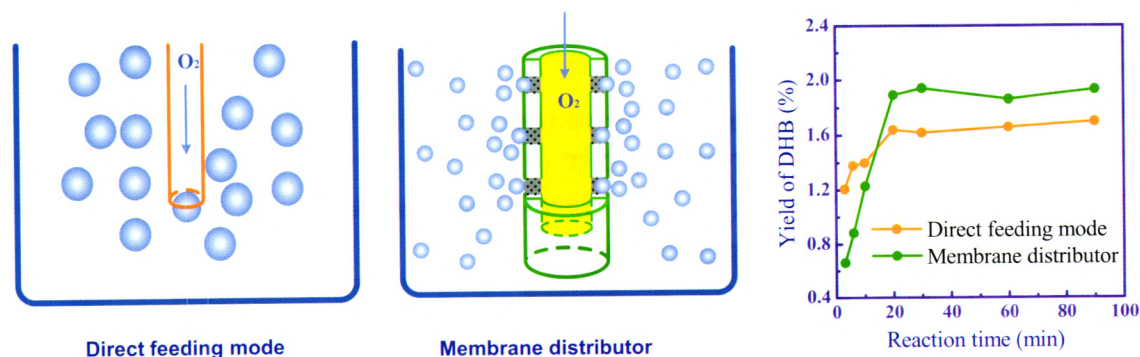


A simple method was used to prepare mesoporous-silica-immobilized Keggin-type tungstophosphoric acid. The resulting catalysts showed high catalytic activities and reusabilities in heterogeneous oxidation of cyclohexene using H_2O_2 as the oxidant.

Enhanced phenol hydroxylation with oxygen using a ceramic membrane distributor

CHEN Rizhi*, BAO Yaohui, XING Weihong, JIN Wanqin, XU Nanping

Nanjing University of Technology

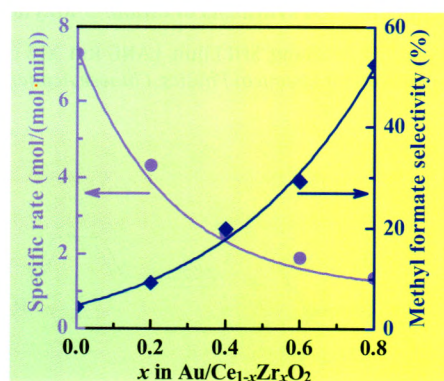


The membrane distributor could provide many small oxygen bubbles, increase the volumetric oxygen transfer coefficient and enhance the gas-liquid mass transfer, resulting in a higher dihydroxybenzene (DHB) yield.

Support effects on properties of Ce-Zr mixed oxide-supported gold catalysts in oxidation of methanol

ZHANG Hongpeng, LIU Haichao*
Peking University

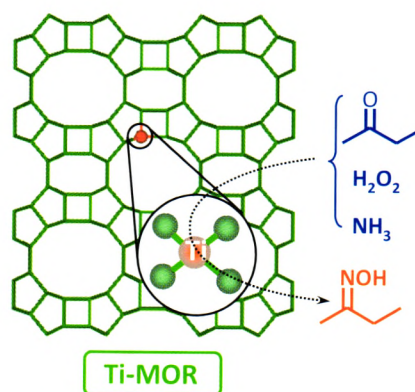
Higher Ce contents in Au/Ce_{1-x}Zr_xO₂ lead to a greater number of active surface oxygen species adjacent to Au sites, and consequently to higher activity and lower methyl formate selectivity in methanol oxidation.



Highly efficient synthesis of methyl ethyl ketone oxime through ammoximation over Ti-MOR catalyst

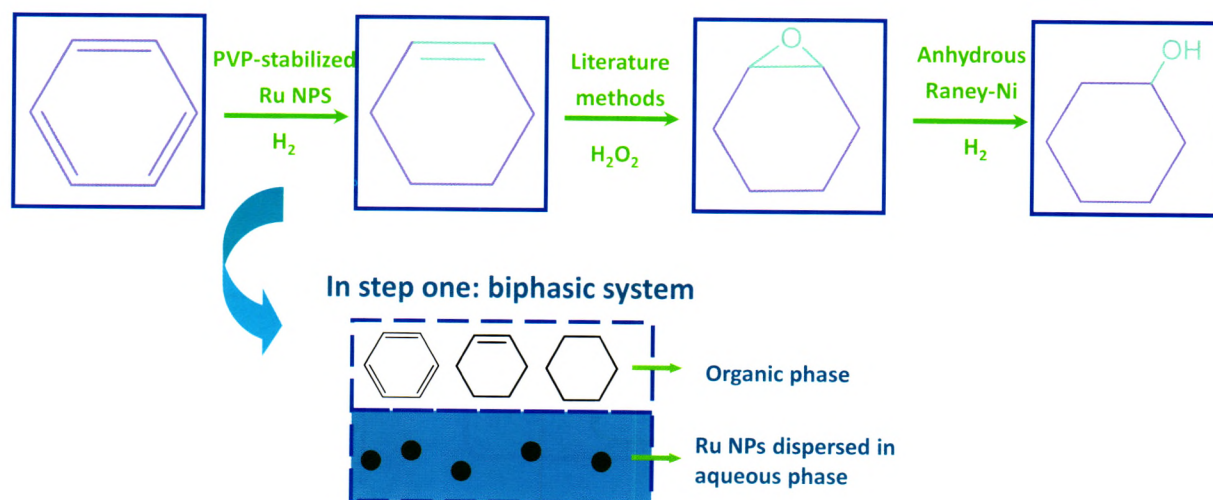
DING Jianghong, XU Le, XU Hao, WU Haihong, LIU Yueming, WU Peng*
East China Normal University

Ti-MOR serves as a highly active, selective, and stable catalyst for the liquid-phase ammoximation of methyl ethyl ketone with ammonia and hydrogen peroxide to corresponding oxime in a continuous slurry reactor, showing 95% ketone conversion and 99% oxime selectivity.



A new method for preparation of cyclohexanol from benzene

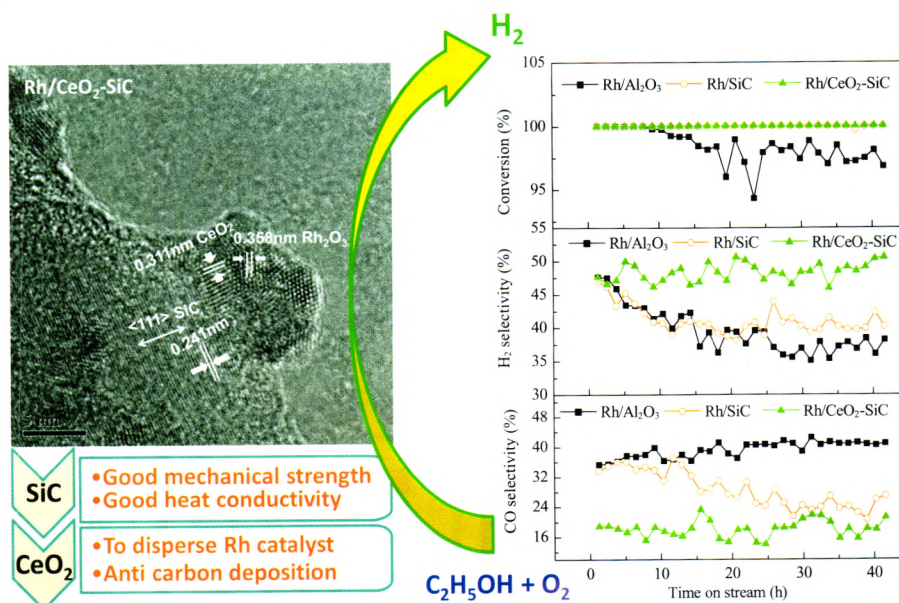
LOU Shujie, XIAO Chaoxian, SUN Geng, KOU Yuan*
Peking University



A new process was developed to prepare cyclohexanol from benzene by a three-step approach. It was found that in selective hydrogenation of benzene and hydrogenation of cyclohexene oxide, the overall yield to produce cyclohexanol from benzene reaches 14% under the optimized reaction conditions.

Rh/CeO₂-SiC as a catalyst in partial oxidation of ethanol for hydrogen production

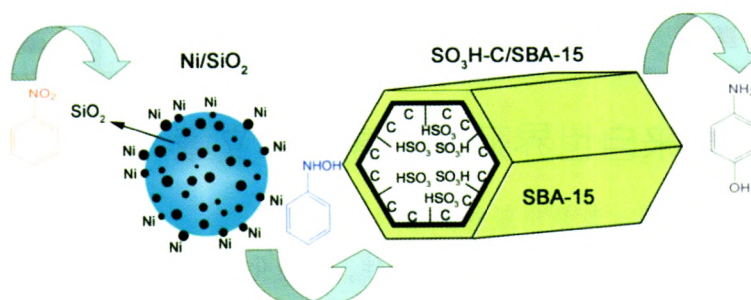
LI Xingyun, WANG Fagen, PAN Xiulian*, BAO Xinhe
Dalian Institute of Chemical Physics, Chinese Academy of Sciences;
Graduate University of Chinese Academy of Sciences



CeO₂-SiC composite has been designed as support of Rh for partial oxidation of ethanol for hydrogen production. The resulting Rh/CeO₂-SiC exhibit a high activity and good stability with a high H₂ selectivity and low CO selectivity at 700 °C. This can be attributed to the unique property of good heat conductivity of SiC and the carbon elimination ability of CeO₂ with active oxygen species.

Catalytic hydrogenation of nitrobenzene to *p*-aminophenol over Ni/SiO₂ and SO₃H-C/SBA-15 solid acid mixed catalyst

BAI Yuting, ZHU Xuecheng, ZHANG Lixiong*, XU Nanping
Nanjing University of Technology



Mechanically mixed 20%Ni/SiO₂ and SO₃H-C/SBA-15 catalysts were used to catalyze hydrogenation of nitrobenzene (NB) to *p*-aminophenol (PAP) with NB conversion of 85.1% and PAP selectivity of 23.8%.