



Chinese Journal of Catalysis

www.cjcatal.org

Volume 38 | Number 4 | April 2017



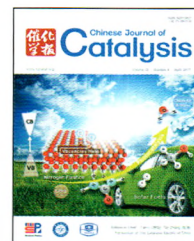


ELSEVIER

available at www.sciencedirect.com



journal homepage: www.elsevier.com/locate/chnjc



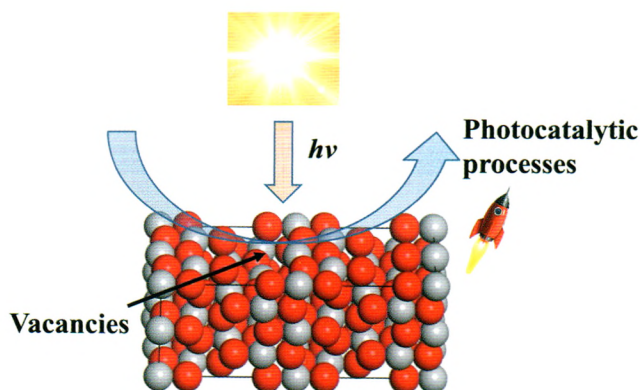
Chinese Journal of Catalysis

Graphical Contents

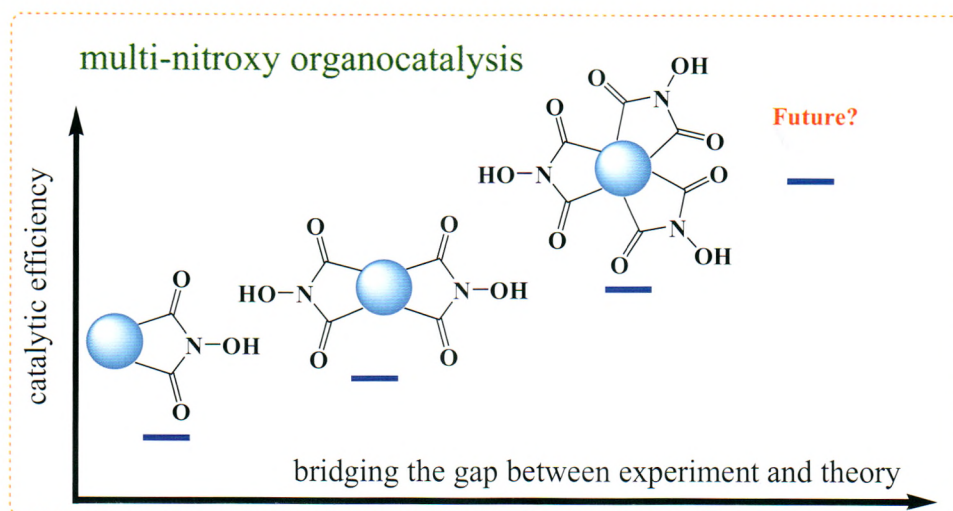
Minireview

Chin. J. Catal., 2017, 38: 617–624 doi: 10.1016/S1872-2067(17)62821-3**Engineering vacancies for solar photocatalytic applications**Mingce Long *, Longhui Zheng
Shanghai Jiao Tong University

Engineering of vacancies represents an effective strategy to boost photocatalytic processes for solar energy applications. This mini-review analyzes the latest progress in the engineering of anion and cation vacancies in the field of photocatalysis.



Review

Chin. J. Catal., 2017, 38: 625–635 doi: 10.1016/S1872-2067(17)62777-3**Selective aerobic oxidation promoted by highly efficient multi-nitroso organocatalysts**Kexian Chen *, Haiying Xie
Zhejiang Gongshang University; Zhejiang NHU Company Ltd.

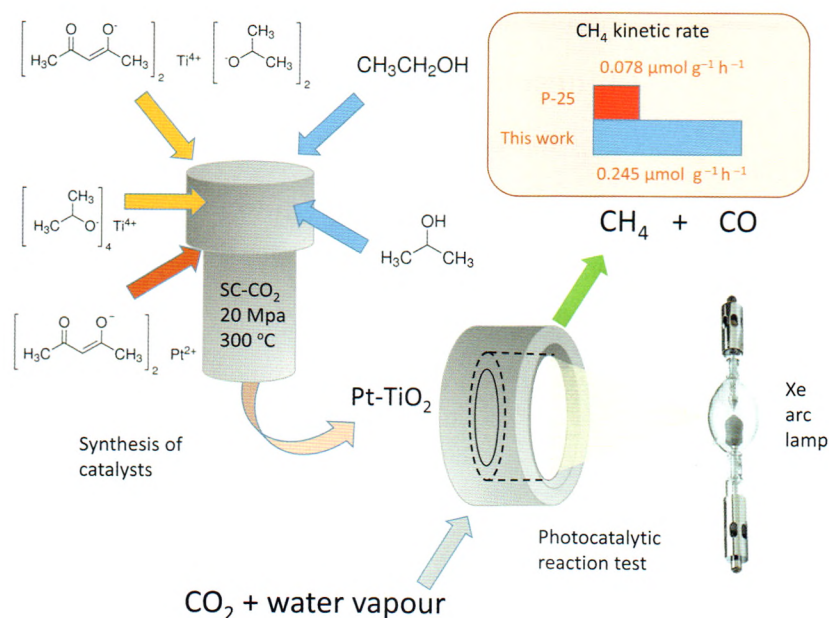
The significant advances in efficient aerobic oxidation catalyzed by multi-nitroso organocatalysts are highlighted in this review, with an emphasis on rational design strategies for, and potential applications of multi-nitroso organocatalysts.

Articles

Chin. J. Catal., 2017, 38: 636–650 doi: 10.1016/S1872-2067(17)62766-9

Supercritical synthesis of platinum-modified titanium dioxide for solar fuel production from carbon dioxide

Susana Tostón, Rafael Camarillo*, Fabiola Martínez, Carlos Jiménez, Jesusa Rincón
University of Castilla-La Mancha, Spain



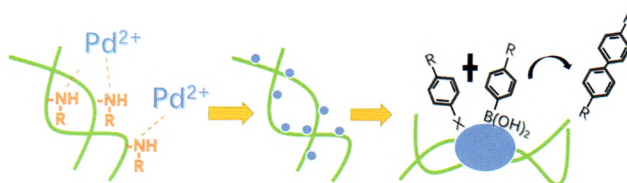
The catalytic properties of Pt/TiO₂ particles can be tuned by simply changing operating parameters like the type of titania precursor and/or hydrolysis agent when their hydrothermal formation reaction is accomplished in supercritical CO₂. The synthesised particles exhibit superior performance to that of a commercial catalyst in the photocatalytic reduction of CO₂ to methane.

Chin. J. Catal., 2017, 38: 651–657 doi: 10.1016/S1872-2067(17)62797-9

Simple synthesis of sub-nanometer Pd clusters: High catalytic activity of Pd/PEG-PNIPAM in Suzuki reaction

Zhe Chen, Yu Liang, Da-Shuang Jia, Zhi-Min Cui*, Wei-Guo Song*
North China Electric Power University; Beihang University; Institute of Chemistry, Chinese Academy of Sciences

A temperature-responsive copolymer, i.e., PEG-PNIPAM, was synthesized and stabilized ultra-small Pd clusters were formed on it by direct reduction. The sub-2-nm Pd nanoclusters showed outstanding catalytic activities in Suzuki reactions.

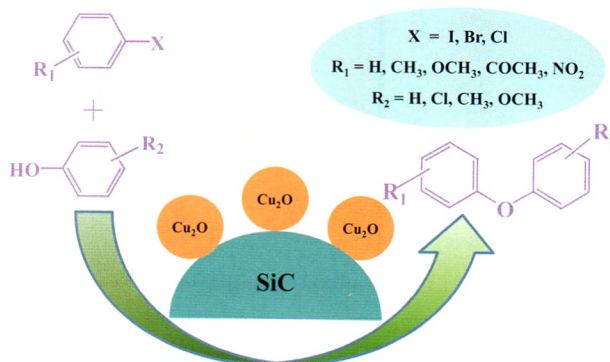


Chin. J. Catal., 2017, 38: 658–664 doi: 10.1016/S1872-2067(17)62785-2

Cu₂O/SiC as efficient catalyst for Ullmann coupling of phenols with aryl halides

Yibing Wang, Xiaoning Guo, Manqian Lü, Zhaoyang Zhai, Yingyong Wang*, Xiangyun Guo
Institute of Coal Chemistry, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Dalian University of Technology

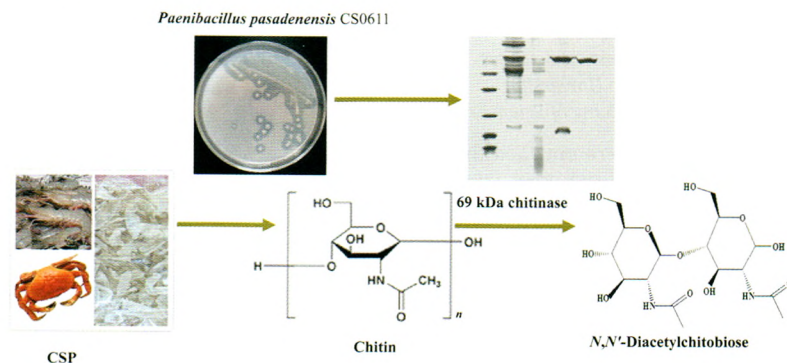
A Cu₂O/SiC heterogeneous catalyst was highly active in Ullmann-type C–O cross-coupling reactions of aryl halides and phenols, with a turnover frequency of up to 1136 h⁻¹, and showed general applicability to Ullmann cross-coupling reactions.



Chin. J. Catal., 2017, 38: 665–672 doi: 10.1016/S1872-2067(17)62787-6

Purification and characterization of alkaline chitinase from *Paenibacillus pasadenensis* CS0611

Xiaoxiao Guo, Pei Xu, Minhua Zong, Wenyong Lou *
South China University of Technology

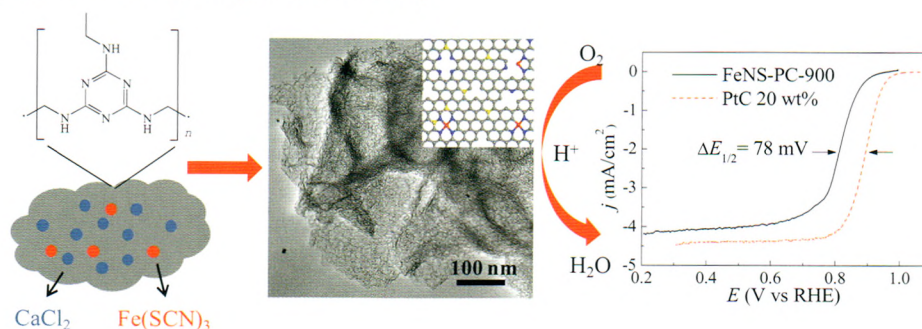


A highly efficient chitinase from *Paenibacillus pasadenensis* CS0611 was purified and characterized for the first time. Furthermore, the main product (GlcNAc)₂ was studied using different substrates.

Chin. J. Catal., 2017, 38: 673–682 doi: 10.1016/S1872-2067(17)62807-9

Fe, N, S-doped porous carbon as oxygen reduction reaction catalyst in acidic medium with high activity and durability synthesized using CaCl₂ as template

Chi Chen, Zhiyou Zhou, Yucheng Wang, Xue Zhang, Xiaodong Yang, Xinsheng Zhang *, Shigang Sun *
East China University of Science and Technology; Xiamen University

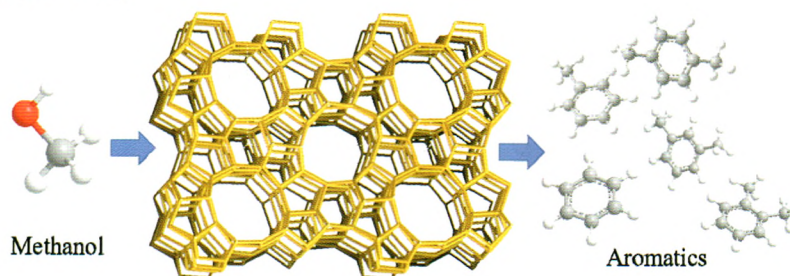


Fe, N, S-doped porous carbon was synthesized by direct carbonization of a mixture of melamine formaldehyde resin and Fe(SCN)₃ using CaCl₂ as a template. The porous carbon showed high activity and durability in the oxygen reduction reaction.

Chin. J. Catal., 2017, 38: 683–690 doi: 10.1016/S1872-2067(17)62791-8

Correlation between H-ZSM-5 crystal size and catalytic performance in the methanol-to-aromatics reaction

Lingzhi Yang, Zhiyuan Liu, Zhi Liu, Wenyong Peng, Yunqi Liu *, Chenguang Liu *
China University of Petroleum (East China)



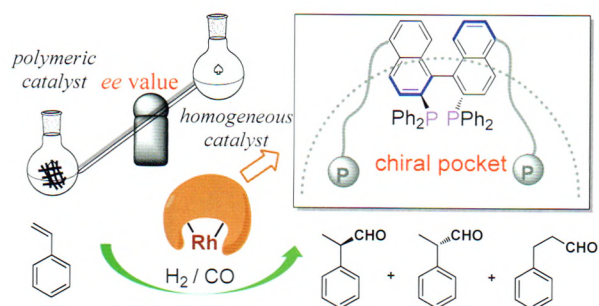
The effect of H-ZSM-5 crystal size on the methanol-to-aromatics reaction has been systematically investigated. Nano-sized hierarchical H-ZSM-5 shows enhanced catalytic activity attributed to the presence of auxiliary meso- and macropores and larger external surface areas.

Chin. J. Catal., 2017, 38: 691–698 doi: 10.1016/S1872-2067(17)62790-6

Porous Rh/BINAP polymers as efficient heterogeneous catalysts for asymmetric hydroformylation of styrene: Enhanced enantioselectivity realized by flexible chiral nanopockets

Tao Wang, Wenlong Wang, Yuan Lyu *, Kai Xiong, Cunyao Li, Hao Zhang, Zhuangping Zhan, Zheng Jiang, Yunjie Ding *
Dalian Institute of Chemical Physics, Chinese Academy of Sciences; University of Chinese Academy of Sciences; Xiamen University; Shanghai Institute of Applied Physics, Chinese Academy of Sciences

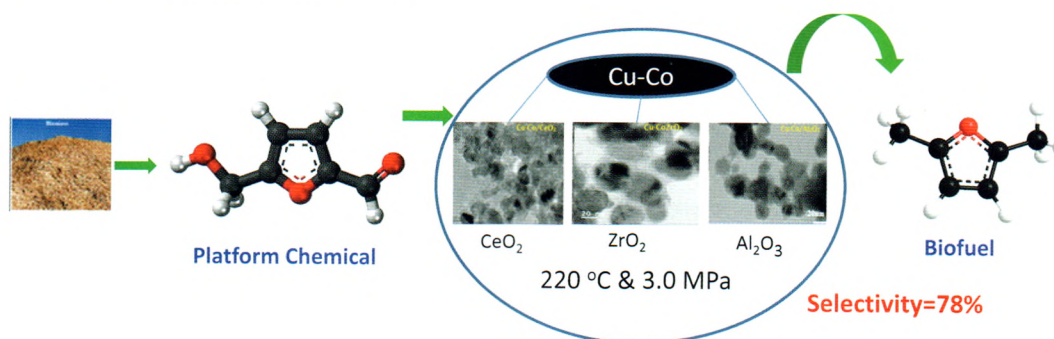
A series of polymer-supported Rh catalysts were obtained through the copolymerization of (*S*)-5,5'-divinyl-BINAP and other co-monomers. The heterogeneous catalyst exhibited higher enantioselectivity than the corresponding homogeneous complex owing to the presence of flexible chiral nanopockets.



Chin. J. Catal., 2017, 38: 699–709 doi: 10.1016/S1872-2067(17)62789-X

Influence of supports for selective production of 2,5-dimethylfuran via bimetallic copper-cobalt catalyzed 5-hydroxymethylfurfural hydrogenolysis

Sanjay Srivastava, G. C. Jadeja, Jigisha Parikh *
Sardar Vallabhbhai National Institute of Technology, India

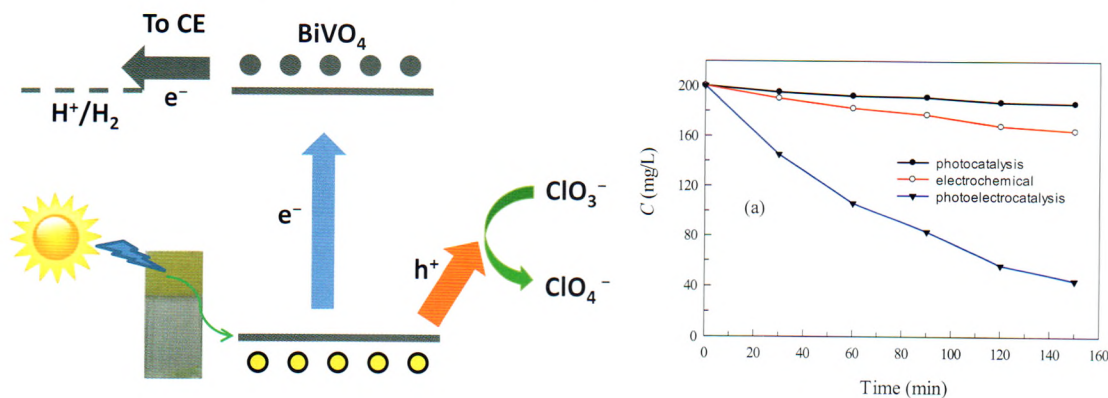


The present study explored the use of non-noble, environmentally benign, bimetallic copper-cobalt catalysts in the selective production of 2,5-dimethylfuran via 5-hydroxymethylfurfural hydrogenolysis.

Chin. J. Catal., 2017, 38: 710–716 doi: 10.1016/S1872-2067(17)62788-8

Synthesis, characterization and application of BiVO₄ photoanode for photoelectrochemical oxidation of chlorate

Seyed Ghorban Hosseini *, Saeid Safshekan
Malek Ashtar University of Technology, Iran; University of Mazandaran, Iran



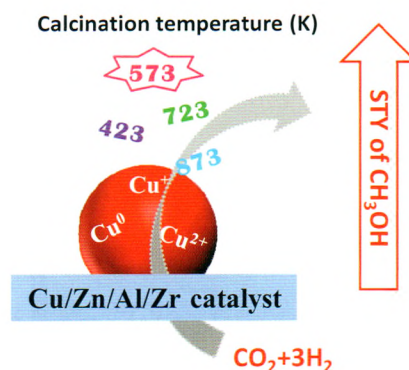
We have synthesized and fully characterized BiVO₄ on FTO substrate. Electrochemical, photochemical and photoelectrochemical oxidation of chlorate was investigated. High rate constant of chlorate oxidation was obtained by photoelectrochemical method, as compared to other two methods.

Chin. J. Catal., 2017, 38: 717–725 doi: 10.1016/S1872-2067(17)62793-1

CO₂ hydrogenation to methanol over Cu/Zn/Al/Zr catalysts prepared by liquid reduction

Xiaosu Dong, Feng Li*, Ning Zhao, Yisheng Tan, Junwei Wang, Fukui Xiao
Institute of Coal Chemistry, Chinese Academy of Sciences;
University of Chinese Academy of Sciences;
National Engineering Research Center for Coal-based Synthesis

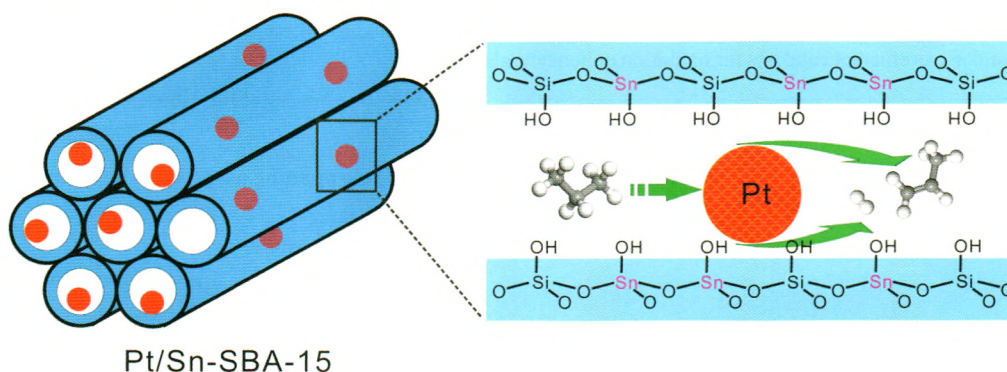
Cu/Zn/Al/Zr catalysts containing Cu²⁺, Cu⁺ and Cu⁰ were prepared via a liquid reduction method and then calcined at different temperatures. These materials were subsequently applied to the synthesis of methanol by the hydrogenation of CO₂ to assess the effects of varying the calcination temperature.



Chin. J. Catal., 2017, 38: 726–735 doi: 10.1016/S1872-2067(17)62805-5

Ordered mesoporous Sn-SBA-15 as support for Pt catalyst with enhanced performance in propane dehydrogenation

Bing Li, Zhenxin Xu, Wei Chu, Shizhong Luo*, Fangli Jing*
Sichuan University, China; Université de Strasbourg, France

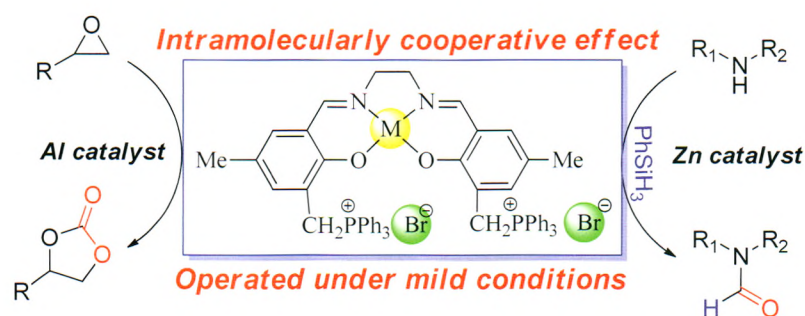


A facile one-pot method was used to synthesize ordered mesoporous Sn-SBA-15-supported Pt catalysts with stable SnO_x species and enhanced promotion by Sn species. The materials gave excellent catalytic performance and good resistance to coking in propane dehydrogenation.

Chin. J. Catal., 2017, 38: 736–744 doi: 10.1016/S1872-2067(17)62802-X

Transformation of carbon dioxide into valuable chemicals over bifunctional metallosalen catalysts bearing quaternary phosphonium salts

Wuying Zhang, Rongchang Luo*, Qihang Xu, Yaju Chen, Xiaowei Lin, Xiantai Zhou, Hongbing Ji[#]
Sun Yat-sen University; Shenzhen Polytechnic



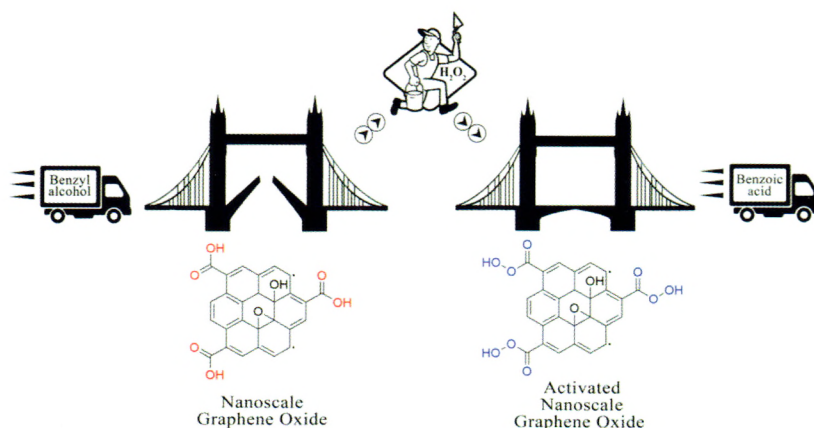
The use of bifunctional metallosalen complexes bearing quaternary phosphonium salts under solvent-free, mild conditions without co-catalysts exhibited high efficiencies catalyzing both the CO₂-based *N*-formylation reaction of amines from hydrosilanes and the cycloaddition of CO₂ to epoxides.

Chin. J. Catal., 2017, 38: 745–757 doi: 10.1016/S1872-2067(17)62776-1

Nanoscale graphene oxide sheets as highly efficient carbocatalysts in green oxidation of benzylic alcohols and aromatic aldehydes

Alireza Sedrpoushan*, Masoud Heidari, Omid Akhavan

Iranian Research Organization for Science and Technology (IROST); Sharif University of Technology



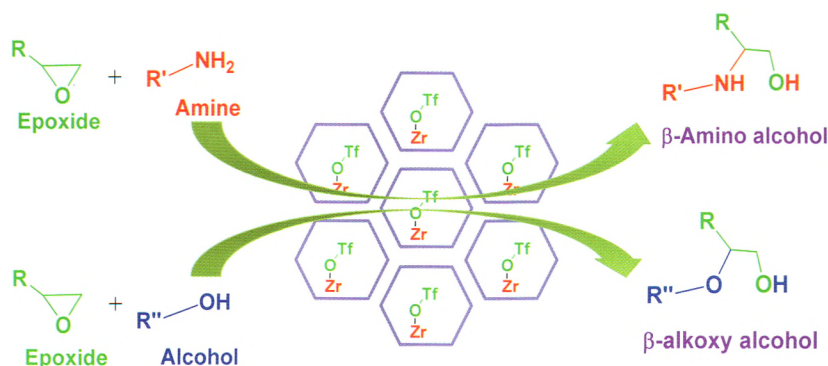
Nanoscale graphene oxide sheets as active graphene-based carbocatalysts with peroxidase-like activity convert to peroxybenzoic acid in the presence of H_2O_2 , and act as efficient catalysts for oxidation of benzylic alcohols.

Chin. J. Catal., 2017, 38: 758–766 doi: 10.1016/S1872-2067(17)62794-3

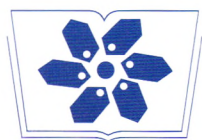
Zirconium triflate grafted on SBA-15 as a highly efficient solid acid catalyst for ring opening of epoxides by amines and alcohols

Kamlesh N. Tayade, Lianyue Wang, Sensen Shang, Wen Dai, Manish Mishra, Shuang Gao *

Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China; Dharmasinh Desai University, India



We report the synthesis of zirconium triflate grafted mesoporous SBA-15 (ZrTf/S) using a simple one-pot-two-step synthesis. ZrTf/S showed excellent activity for ring opening of epoxides by various amines and alcohols under ambient conditions.



中国科学院科学出版基金资助出版



Chinese Journal of
Catalysis

月刊 SCI 收录 2017 年 4 月 第 38 卷 第 4 期



目 次

小 综 述

617

用于太阳光催化反应的空位工程

龙明策, 郑龙辉

综 述

625

高效多羟胺有机催化剂选择性催化分子氧氧化研究进展

陈可先, 谢海英

论 文

636

超临界合成Pt修饰的TiO₂用于光催化CO₂还原制备太阳能燃料

Susana Tostón, Rafael Camarillo, Fabiola Martínez,

Carlos Jiménez, Jesusa Rincón

651

亚纳米级的Pd团簇的简易合成: Pd/PEG-PNIPAM复合物及其Suzuki反应中的极高催化性能

陈哲, 梁宇, 贾大爽, 崔志民, 宋卫国

658

Cu₂O/SiC高效催化卤代芳烃与酚类的Ullmann偶联反应

王一冰, 郭晓宁, 吕曼乾, 翟兆洋, 王英勇, 郭向云

665

来源于类芽孢杆菌属碱性甲壳素酶的分离纯化及其性质

郭潇潇, 徐培, 宗敏华, 姜文勇

673

以CaCl₂为模板合成的高活性和高稳定性铁、氮、硫共掺杂多孔碳氧还原电催化剂

陈驰, 周志有, 王宇成, 张雪, 杨晓冬, 张新胜, 孙世刚

683

不同晶粒尺寸H-ZSM-5催化剂上甲醇芳构化反应性能

杨灵芝, 刘志远, 刘智, 彭文永, 柳云骥, 刘晨光

691

多孔有机含BINAP聚合物负载Rh催化剂在苯乙烯不对称氢甲酰化中的应用: 柔性手性口袋对产物对映体选择性的提高作用

王涛, 汪文龙, 吕元, 熊凯, 李存耀, 张浩, 詹庄平, 姜政,

丁云杰

699

载体对其负载的Cu-Co双金属催化剂上5-羟甲基糠醛氢解选择性生成2,5-二甲基呋喃的影响

Sanjay Srivastava, G. C. Jadeja, Jigisha Parikh

710

用于光电化学氧化氯酸盐的钒酸铋光电阳极的合成与表征

Seyed Ghorban Hosseini, Saeid Safshekan

717

液相还原法制备Cu/Zn/Al/Zr催化剂用于CO₂加氢合成甲醇

董晓素, 李枫, 赵宁, 谭荷生, 王军威, 肖福魁

726

有序介孔Sn-SBA-15负载铂催化剂上丙烷脱氢性能的提高

李冰, 徐振新, 储伟, 罗仕忠, 敬方梨

736

季膦盐型双功能金属Salen配合物催化二氧化碳转化为高附加值化学品

张武英, 罗荣昌, 徐祺航, 陈亚举, 林小微, 周贤太, 纪红兵

745

纳米尺度氧化石墨烯层作为高效碳催化剂用于苣醇与芳香醛的绿色氧化

Alireza Sedrpoushan, Masoud Heidari, Omid Akhavan

758

高效固体酸SBA-15-Zr(OTf)₃催化胺或醇开环环氧化合物

Kamlesh N. Tayade, 王连月, 尚森森, 戴文, Manish Mishra,

高爽

相关信息

624 《催化学报》为被国际期刊退稿的高质量论文开辟绿色通道

英文全文电子版(国际版)由Elsevier出版社在ScienceDirect上出版

<http://www.sciencedirect.com/science/journal/18722067>

<http://www.elsevier.com/locate/chnjc>

www.cjcatal.org

在线投审稿网址

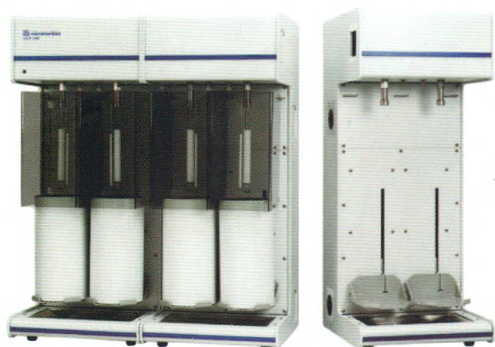
<https://mc03.manuscriptcentral.com/cjcatal>

美国麦克仪器公司

美国麦克仪器成立于1962年，是材料特性实验室分析仪器和服务的领导者。公司致力于生产分析粉末/固体材料物理化学性质的全自动化仪器，能够进行比表面积、孔容、孔径、孔径分布、密度、催化剂性质表征、催化剂活性测试以及粒度粒形分析，可广泛用于基础研究、产品开发及质量控制等各个阶段。

ASP2460扩展式物理吸附分析仪

- 组合式可升级站数的多站物理吸附仪
- 模块化设计，两站、四站、六站可选
- 独立式分析站，分析效率高
- 可组合配置介孔分析、微孔分析和氮气吸附功能
- 可选不同控温配件，不同样品处理脱气站
- 大容量杜瓦瓶保证长时间分析
- 专利等温夹套设计保证样品管和P0管死体积恒定，保证分析精度
- 内置MicroActive控制处理软件



AutoChem® II 系列高性能全自动化学吸附仪

- 配备高精度的质量流量计
- 抗腐蚀性检测器灯丝可分析大多数腐蚀性气体，减少灯丝氧化
- 配备质谱仪端口和集成软件，可同时在TCD和质谱仪上进行检测
- 配备强大的峰编辑和数据处理软件
- 可选KwikCool冷却炉，可快速降温
- 可选低温CryoCooler II 配件，可进行低温吸附
- 可选蒸汽发生器，进行蒸汽吸附



3Flex 全功能型多用气体吸附仪

- 三个独立的分析站，可组合配置介孔分析、微孔分析、氮气吸附功能
- 可进行蒸汽吸附分析，可选不同蒸汽发生器选件
- 全部歧管管线以及传感器在45℃保温状态下工作
- 管线全部为SS316 VCR密封连接
- 大容量杜瓦瓶保证长时间分析
- 专利等温夹套设计保证样品管和P0管死体积恒定，保证分析精度
- 内置MicroActive控制处理软件
- 可选三站同时使用三种不同吸附气体功能
- 可选静态化学吸附功能



全国服务热线电话：400-630-2202

麦克默瑞提克（上海）仪器有限公司
总部地址：上海市民生路600号船研大厦1505-1509室
电话：021-58841188



麦克仪器官方微信

ISSN 0253-9837



9 770253 983177

04>