http://www.chxb.cn
ISSN 0253-9837
CN 21-1195/O6
CODEN THHPD3

催化学报

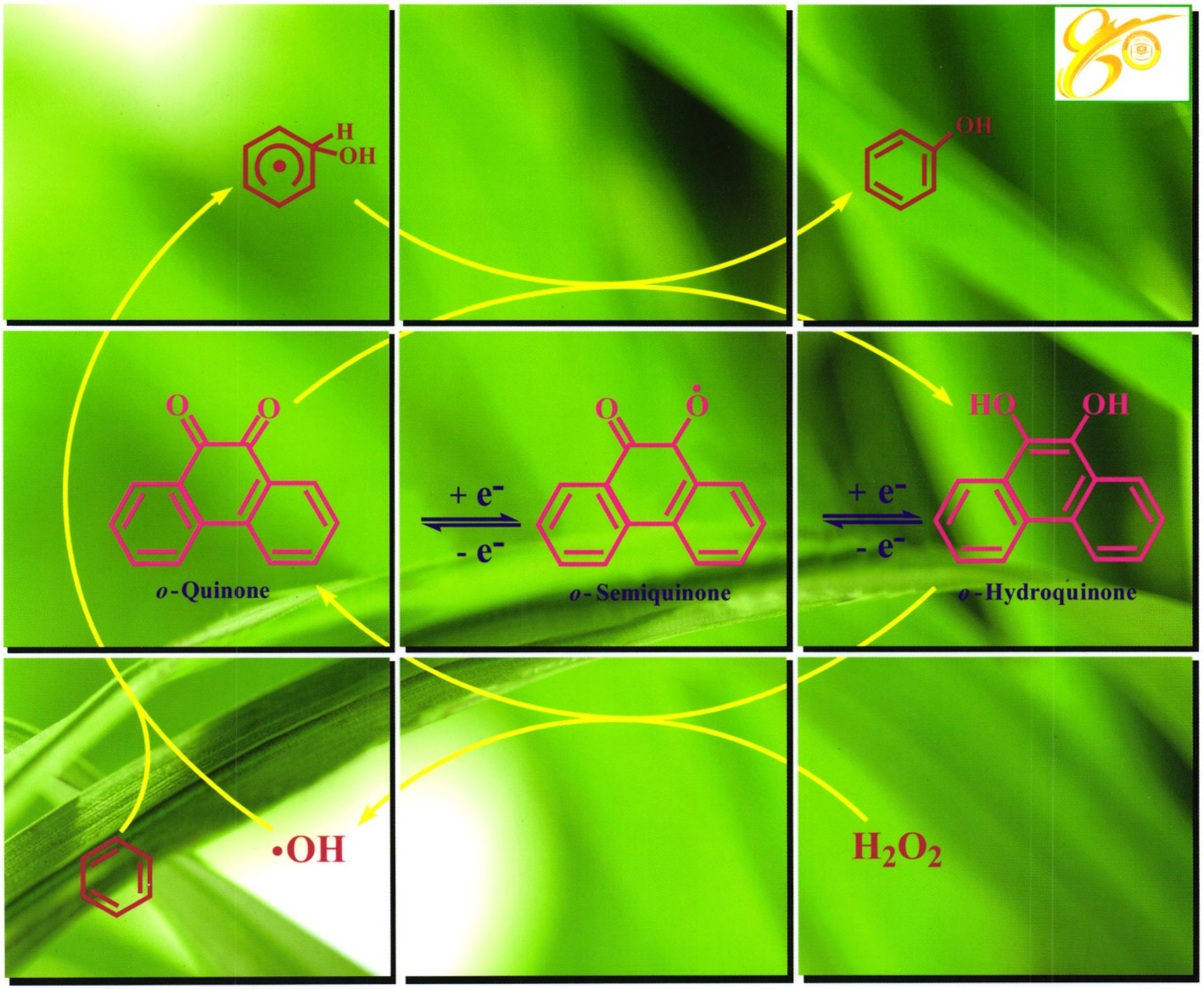
CHINESE JOURNAL OF CATALYSIS

主编 林励吾

Editor-in-Chief LIN Liwu

2012

Vol. 33 No. 10



ISSN 0253-9837

中国化学会催化学会会刊

Transaction of the Catalysis Society of China

Science Press

中国科学院科学出版基金资助出版

催化学报
(CUIHUA XUEBAO)
CHINESE JOURNAL OF CATALYSIS
月刊 SCI收录 2012年10月 第33卷 第10期

目 次

综 述

1611 (国际版)
环境催化中的陶瓷材料: 应用与可能性
Nitin LABHSETWAR, P. DOGGALI, S. RAYALU, R. YADAV1, T. MISTUHASHI, H. HANEDA

研究论文

1622 (国际版/封面文章)
活性炭催化苯一步羟基化制备苯酚
徐加泉, 刘慧慧, 杨瑞光, 李桂英, 胡常伟

1631 (国际版)
程序升温表面反应技术研究氧化铈上 H_2S 的吸附和转化
刘冰, 徐恒泳, 张泽会

1636 (国际版)
$Yb(OTf)_3$ 催化的碳氢键活化 2-甲基氮杂芳烃对靛红的加成反应
牛瑞, 杨世迎, 肖建, 梁涛, 李兴伟

1642 (国际版)
第二金属对 Co/SiO_2 加氢催化剂结构和性能的影响
薛晶晶, 崔芳, 黄志威, 左建良, 陈静, 夏春谷

1650 (国际版)
不对称还原制备光学纯 (*R*)-2-羟基-4-苯基丁酸乙酯的双酶共表达重组菌的构建
宿宇宁, 倪晔, 王骏超, 徐志豪, 孙志浩

1661 (国际版)
一种高效简易的聚(4-乙烯基三溴化吡啶)催化乙醇合成乙酸盐的方法
Maryam HAJJAMI, Arash GHORBANI-CHOGHAMARANI, Masoomeh NOROUZI

1665 (国际版)
高结晶度氮掺杂介孔 TiO_2 的制备及光催化活性
刘二强, 郭晓玲, 秦雷, 申国栋, 王向东

1672 (国际版)
LED 照射光催化剂用于苯、甲苯、乙苯和二甲苯分解
JO Wan-Kuen, KANG Hyun-Jung

1681
溶胶-凝胶辅助水热双模板法制备球形介孔 TiO_2
王殿平, 刘守新

1689
氨基功能化介孔氧化硅纳米中空球负载乙酰丙酮氧钒催化苯甲硫醚选择性氧化反应
王鹏, 白诗扬, 李博, 杨启华

1696
Sn-MCM-41 与 SnO_2/SiO_2 催化转化生物质基碳水化合物制乳酸甲酯
刘镇, 冯刚, 潘春燕, 李望, 陈平, 楼辉, 郑小明

1706
Rh(111) 及 Rh@Cu(111) 表面乙烯氢甲酰化反应选择性的理论研究
马秀芳, 赵永慧, 苏海燕, 李微雪

1712
Cu 在 ZrO_2(111) 薄膜载体上的生长与界面相互作用
侯建波, 韩永, 潘永和, 徐倩, 潘海斌, 朱俊发

1717
基于同源建模和定点突变技术研究嗜热型 L-阿拉伯糖异构酶与 D-半乳糖的亲和作用
李贵祥, 徐铮, 李莎, 徐虹

1724
核壳型 SAPO-34/AlPO-18 分子筛的制备及生长机理
张琳, 田鹏, 苏雄, 樊栋, 王德花, 刘中民

1730
4-二甲氨基吡啶催化的界面聚合法制备超支化聚乙烯亚胺复合膜
张林, 林赛赛, 魏平, 程丽华, 陈欢林

1736
纳米纤维铁氧化物柱撑蒙脱土可见光助芬顿降解罗丹明 B
张世龙, 胡小明, 王晓韡, 梁诗景, 吴核

相关信息

1742 作者索引

www.chxb.cn

Supported by the Science Publication Foundation of the CAS

催化学报
(CUIHUA XUEBAO)
CHINESE JOURNAL OF CATALYSIS
Monthly Vol. 33 No. 10 October 2012

Contents

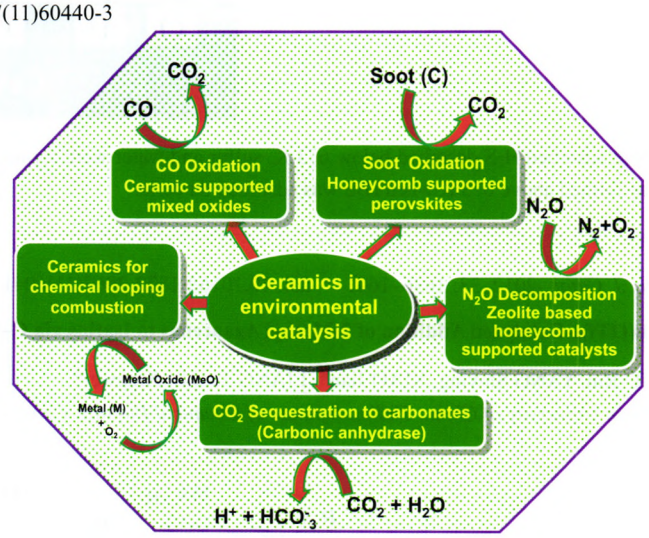
Review

Chin. J. Catal., 2012, 33: 1611–1621 doi: 10.1016/S1872-2067(11)60440-3

Ceramics in Environmental Catalysis: Applications and Possibilities

Nitin LABHSETWAR*, P. DOGGALI, S. RAYALU, R. YADAV, T. MITSUHASHI, H. HANEDA
National Environmental Engineering Research Institute (CSIR-NEERI), India;
National Institute for Materials Science (NIMS), Japan

The article deals with various environmental applications of ceramic based materials and structures. Synthesis, characterization, and catalytic properties of various ceramic materials including catalyst supports are discussed.

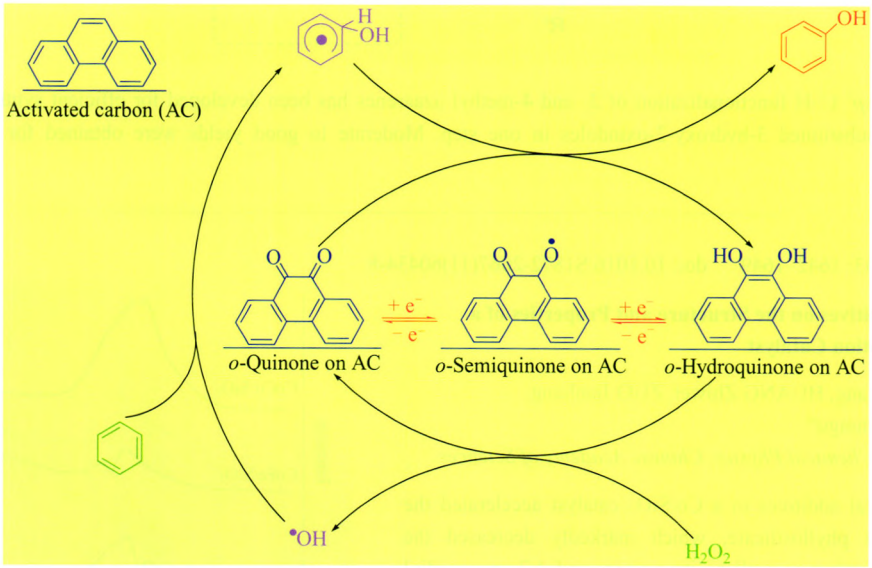


Articles

Chin. J. Catal., 2012, 33: 1622–1630 doi: 10.1016/S1872-2067(11)60444-0

Hydroxylation of Benzene by Activated Carbon Catalyst

XU Jiaquan, LIU Huihui, YANG Ruiguang, LI Guiying*, HU Changwei*
Sichuan University

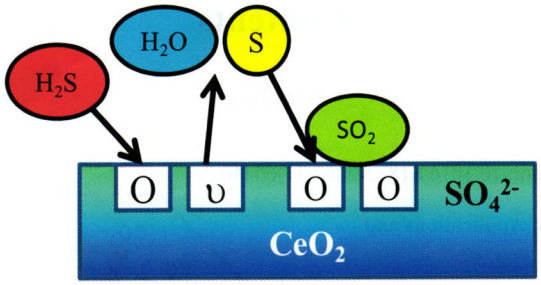


The reaction between phenolic hydroxyl and quinone on the surface of activated carbon activated H_2O_2 to form a OH radical, which then reacts with benzene to form phenol.

Chin. J. Catal., 2012, 33: 1631–1635 doi: 10.1016/S1872-2067(11)60416-6

Temperature-Programmed Surface Reaction Study of Adsorption and Reaction of H_2S on Ceria

LIU Bing, XU Hengyong*, ZHANG Zehui*
South-Central University for Nationalities; Dalian Institute of Chemical Physics, Chinese Academy of Sciences

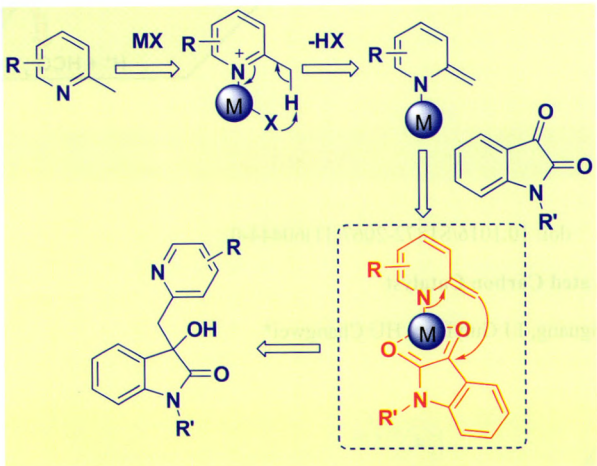


Some adsorbed H_2S desorbed below 673 K, sulfur and water were formed below 473 K, SO_2 was formed from 473 to 673 K, and sulfate was formed above 673 K when H_2S was adsorbed on ceria.

Chin. J. Catal., 2012, 33: 1636–1641 doi: 10.1016/S1872-2067(11)60414-2

$Yb(OTf)_3$-Catalyzed Addition of 2-Methyl Azaarenes to Isatins via C–H Functionalization

NIU Rui, YANG Shiying, XIAO Jian*, LIANG Tao, LI Xingwei*
Ocean University of China; Dalian Institute of Chemical Physics, Chinese Academy of Science



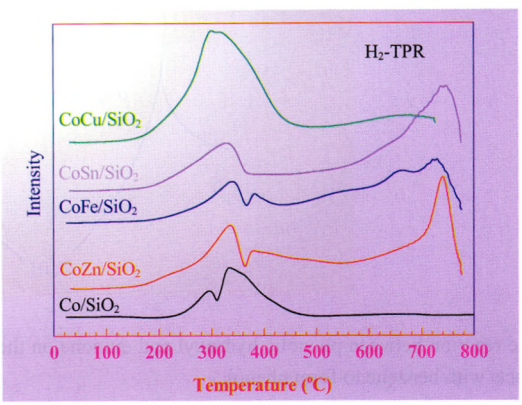
$Yb(OTf)_3$-catalyzed sp^3 C–H functionalization of 2- and 4-methyl azaarenes has been developed for efficient synthesis of biologically important azaarene-substituted 3-hydroxy-2-oxindoles in one step. Moderate to good yields were obtained for various isatins and azaarenes.

Chin. J. Catal., 2012, 33: 1642–1649 doi: 10.1016/S1872-2067(11)60434-8

Effect of Metal Additives on the Structure and Properties of a Co/SiO_2 Hydrogenation Catalyst

XUE Jingjing, CUI Fang, HUANG Zhiwei, ZUO Jianliang, CHEN Jing*, XIA Chungu*
Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences

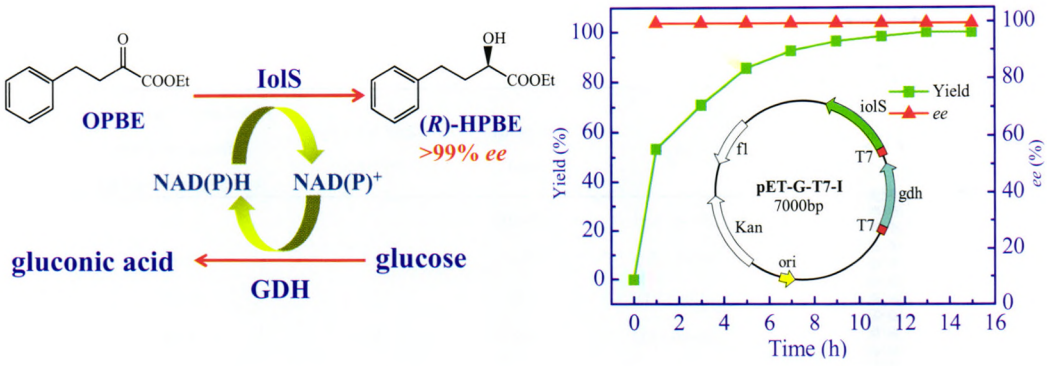
Incorporation of metal additives in a Co/SiO_2 catalyst accelerated the formation of cobalt phyllosilicate, which markedly decreased the reducibility of the catalyst as well as its activity and 1,2-propanediol selectivity in the hydrogenation of ethyl lactate.



Chin. J. Catal., 2012, 33: 1650–1660 doi: 10.1016/S1872-2067(11)60436-1

Two-Enzyme Coexpressed Recombinant Strain for Asymmetric Synthesis of Ethyl (*R*)-2-Hydroxy-4-phenylbutyrate

SU Yuning, NI Ye*, WANG Junchao, XU Zhihao, SUN Zhihao
Jiangnan University

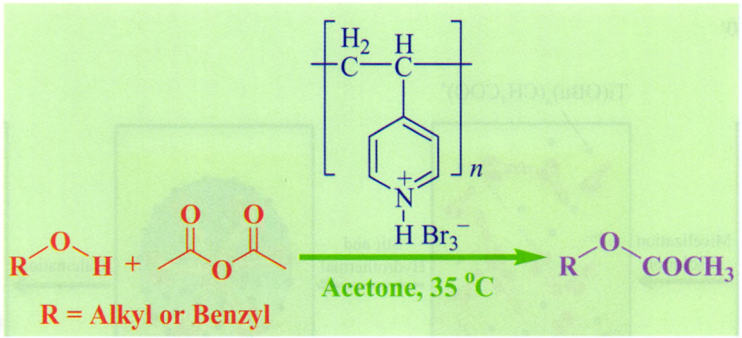


A carbonyl reductase (IolS) exhibiting high enantioselectivity in the reduction of OPBE to (*R*)-HPBE was cloned, characterized, and coexpressed with glucose dehydrogenase to construct recombinant *E. coli* with cofactor regeneration.

Chin. J. Catal., 2012, 33: 1661–1664 doi: 10.1016/S1872-2067(11)60441-5

An Efficient and Facile Procedure for Synthesis of Acetates from Alcohols Catalyzed by Poly(4-vinylpyridinium tribromide)

Maryam HAJJAMI*, Arash GHORBANI-CHOGHAMARANI, Masoomeh NOROUZI
Ilam University, Iran



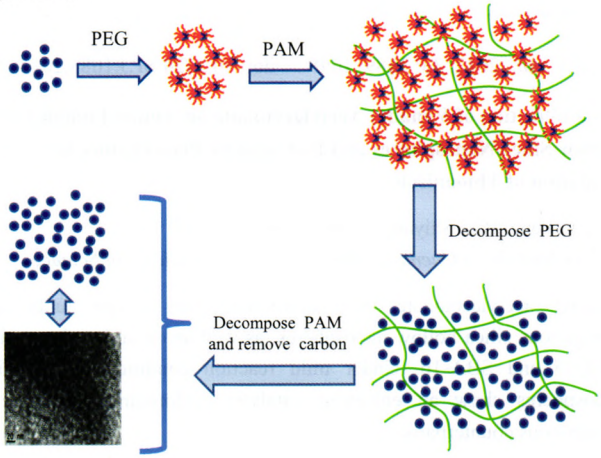
Acetylation of alcohols has been introduced using acetic anhydride in the presence of a catalytic amount of poly(4-vinylpyridinium tribromide).

Chin. J. Catal., 2012, 33: 1665–1671 doi: 10.1016/S1872-2067(11)60437-3

Fabrication and Photocatalytic Activity of Highly Crystalline Nitrogen Doped Mesoporous TiO_2

LIU Erqiang, GUO Xiaoling, QIN Lei, SHEN Guodong, WANG Xiangdong*
Xi'an Jiaotong University; Xi'an Polytechnic University

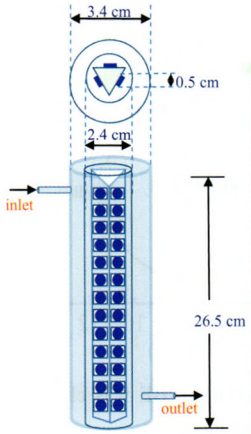
Nitrogen doped mesoporous TiO_2 photocatalysts with high crystallinity were fabricated by the sol-gel method using polyacrylamide and polyethylene glycol as templates, and then calcining in nitrogen and air.



Chin. J. Catal., 2012, 33: 1672–1680 doi: 10.1016/S1872-2067(11)60446-4

LED Irradiation of a Photocatalyst for Benzene, Toluene, Ethyl Benzene, and Xylene Decomposition

JO Wan-Kuen*, KANG Hyun-Jung
Kyungpook National University, Korea



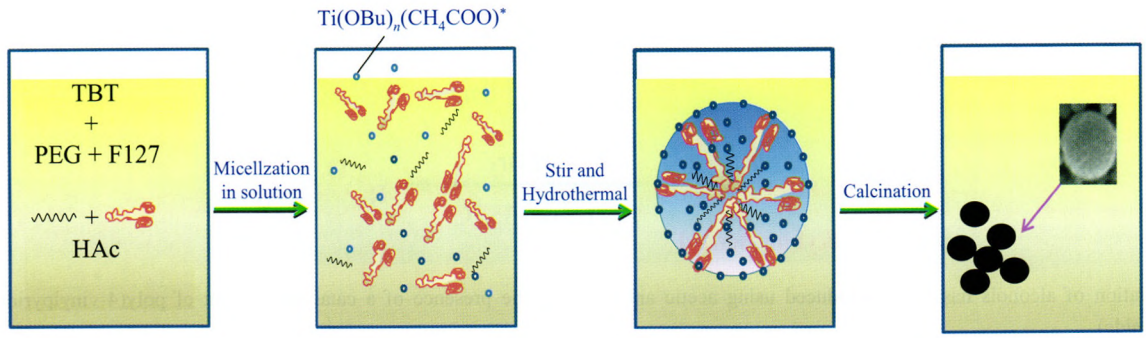
Lamp	Wavelength (nm)	Light intensity (mW/cm)	Photocatalytic degradation efficiency to power consumption (mg/kW)
Fluorescent	400–700	1.2	0.005
White-LED	450	2.3	0.007
Blue-LED	470	2.4	0.007
Green-LED	252	1.5	0.003
Yellow-LED	600–615	1.9	0.004
Red-LED	645–700	0.8	–

The use of chips of visible light emitting diodes to irradiate an annular reactor coated with a nitrogen doped titania catalyst to decompose gaseous aromatic compounds was studied.

Chin. J. Catal., 2012, 33: 1681–1688 doi: 10.3724/SP.J.1088.2012.20532

Preparation of Mesoporous TiO_2 Spheres via Sol-Gel Assisted Hydrothermal Method Using Double Templates

WANG Dianping, LIU Shouxin*
Northeast Forestry University



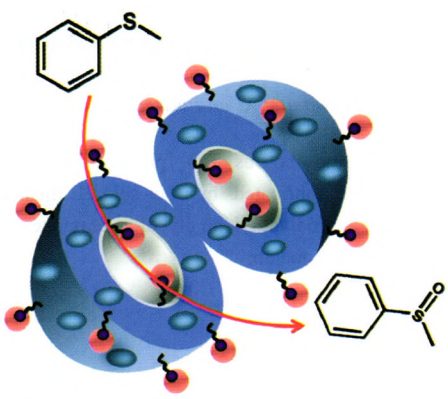
Mesoporous TiO_2 (MS-TiO_2) spheres were synthesized with double surfactant (PEG and F127) as templates, which showed higher reliability than single template.

Chin. J. Catal., 2012, 33: 1689–1695 doi: 10.3724/SP.J.1088.2012.20520

Immobilization of Vanadyl Acetylacetonate on Amino Functionalized Hollow Silica Nanospheres and Its Catalytic Performance for Selective Oxidation of Thioanisole

WANG Peng, BAI Shiyang, LI Bo, YANG Qihua*
Dalian Institute of Chemical Physics, Chinese Academy of Sciences

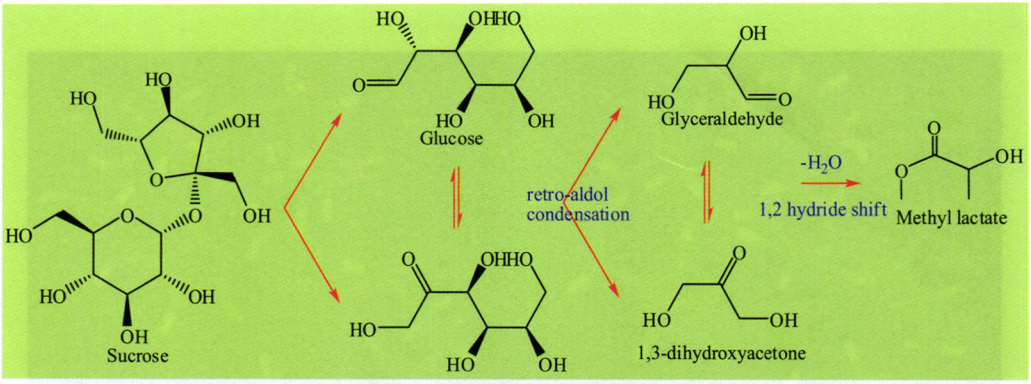
Vanadyl acetylacetonate was immobilized on amino functionalized mesoporous silica hollow nanospheres, as well as on amino functionalized SBA-15 and SBA-16. Under mild reaction conditions, the vanadium nanospheres show an enhanced catalytic performance than the bulk mesoporous counterparts.



Chin. J. Catal., 2012, 33: 1696–1705 doi: 10.3724/SP.J.1088.2012.20533

Conversion of Biomass-Derived Carbohydrates to Methyl Lactate Using Sn-MCM-41 and SnO_2/SiO_2

LIU Zhen, FENG Gang, PAN Chunyan, LI Wang, CHEN Ping, LOU Hui*, ZHENG Xiaoming
Zhejiang University; Shaoxing Testing Institute of Quality Technical Supervision

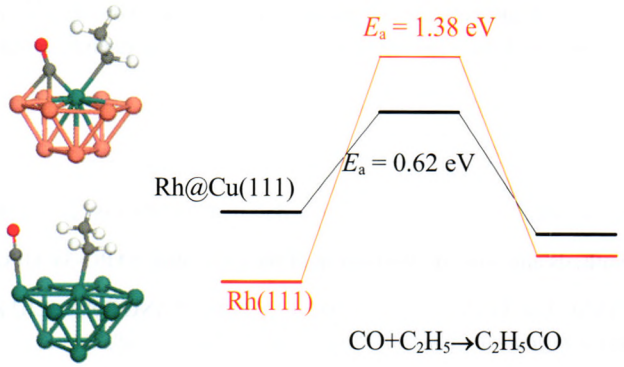


Biomass-derived carbohydrates were used as feedstock and methyl lactate was obtained in higher yield of 40%. Catalysts used in this work are easy synthesis, operational simplicity, reusability, and safe handling.

Chin. J. Catal., 2012, 33: 1706–1711 doi: 10.3724/SP.J.1088.2012.20617

Theoretical Study of Selectivity of Ethylene Hydroformylation on Rh(111) and Rh@Cu(111) Surfaces

MA Xiufang, ZHAO Yonghui, SU Haiyan, LI Weixue*
Dalian Institute of Chemical Physics, Chinese Academy of Sciences

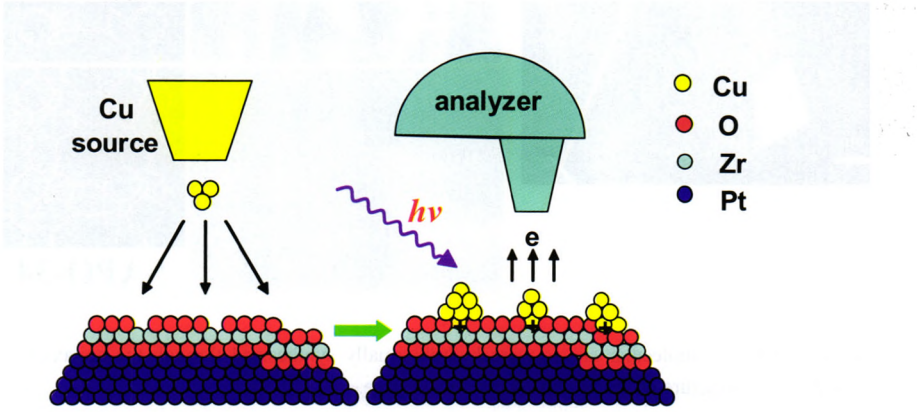


Due to the ensemble and ligand effects on Rh@Cu(111) destabilizing the reactants (CO and C_2H_5), the RhCu alloy catalyst has a low CO insertion barrier with improved hydroformylation selectivity compared with the pristine Rh(111).

Chin. J. Catal., 2012, 33: 1712–1716 doi: 10.3724/SP.J.1088.2012.20640

Growth and Interfacial Interaction of Cu on ZrO_2(111) Thin Film

HOU Jianbo, HAN Yong, PAN Yonghe, XU Qian, PAN Haibin, ZHU Junfa*
University of Science and Technology of China

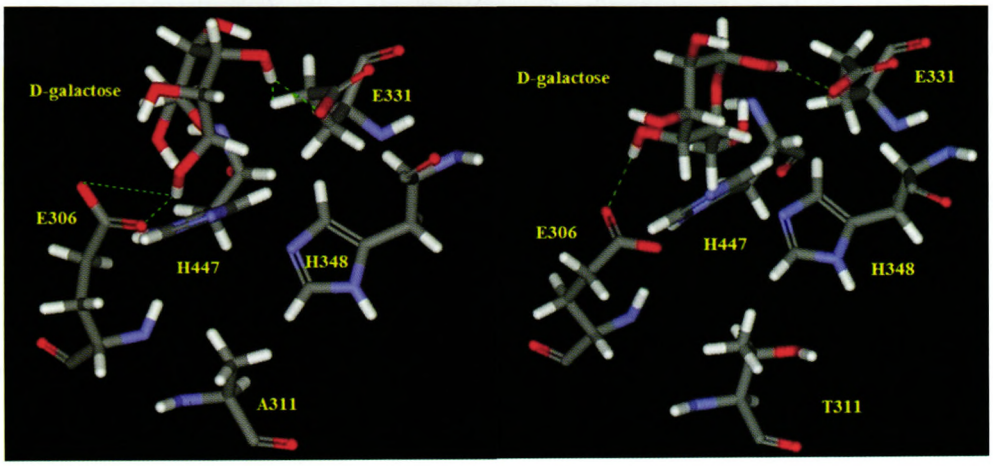


Cu grows two-dimensionally on ZrO_2(111)/Pt(111) up to 0.15 ML at 300 K, followed by three-dimensional growth. At low coverages, Cu(I) state appears. Above 1 ML, Cu becomes metallic state.

Chin. J. Catal., 2012, 33: 1717–1723 doi: 10.3724/SP.J.1088.2012.20606

Probing the Essential Catalytic Residues and Substrate Affinity in Thermophilic L-Arabinose Isomerase by Homology Modeling and Site-Directed Mutagenesis

LI Guixiang, XU Zheng, LI Sha, XU Hong*
Nanjing University of Technology

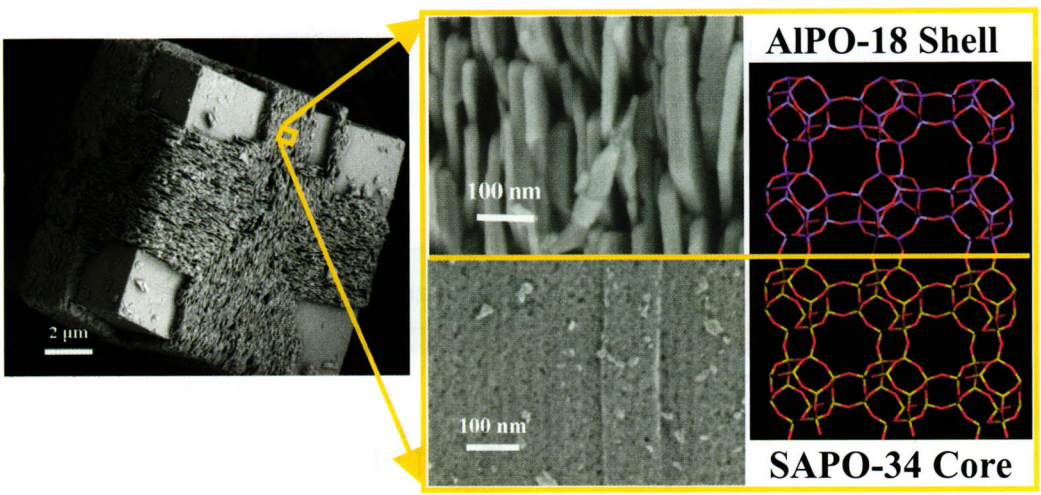


By means of site-directed mutagenesis, the LFAI native enzyme has been successfully mutated. Among the obtained mutants, some exhibited an enhancement on substrate conversion rate. For mutants relevant to amino acid residue No. 311, we found that the number of hydrogen bonds between substrate (D-galactose) and the catalytic center has an influence on the D-galactose conversion rate.

Chin. J. Catal., 2012, 33: 1724–1729 doi: 10.3724/SP.J.1088.2012.20650

Synthesis and Growth Mechanism of the Core-Shell SAPO-34/AlPO-18 Molecular Sieves

ZHANG Lin, TIAN Peng, SU Xiong, FAN Dong, WANG Dehua, LIU Zhongmin*
Dalian Institute of Chemical Physics, Chinese Academy of Sciences

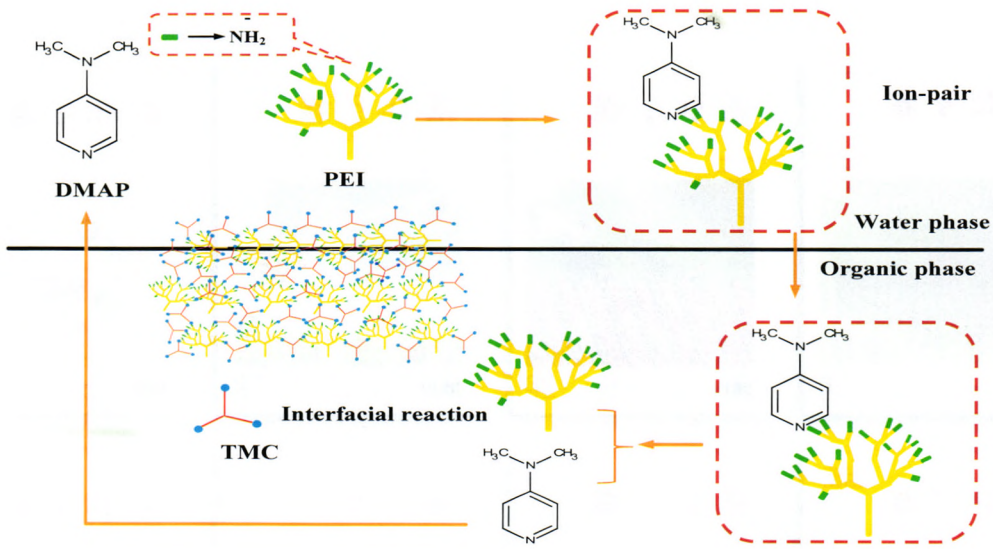


The core-shell SAPO-34/AlPO-18 molecular sieves were hydrothermally synthesized through the epitaxial growth of AlPO-18 shell induced rationally by the microstructure on the SAPO-34 external surface.

Chin. J. Catal., 2012, 33: 1730–1735 doi: 10.3724/SP.J.1088.2012.20427

Preparation of Hyperbranched Polyethyleneimine Composite Membrane Using Interfacial Polymerization Catalyzed by 4-Dimethylaminopryidine

ZHANG Lin, LIN Saisai, WEI Ping, CHENG Lihua*, CHEN Huanlin
Zhejiang University

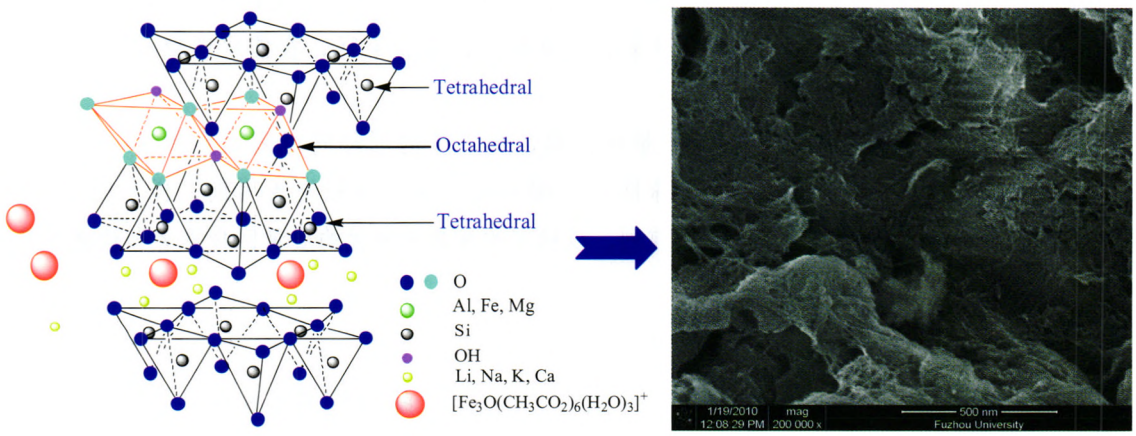


The promoting effect of 4-dimethylaminopryidine (DMAP) on the interfacial polymerization between trimesoyl chloride (TMC) and hyperbranched polyethyleneimine(PEI) to prepare reverse osmosis membrane was investigated. The rejection against NaCl of PEI/TMC reverse osmosis composite membrane was improved from 45.2% to 85.4%.

Chin. J. Catal., 2012, 33: 1736–1741 doi: 10.3724/SP.J.1088.2012.20756

Photo-Fenton Degradation of RhB over Nano-fibre Iron Oxides Interacted Montmorillonite under Visible Light Irradiation

ZHANG Shilong, HU Xiaoming, WANG Xiaowei, LIANG Shijing, WU Ling*
Fuzhou University; *Western Geological Exploration Brigade of Jiangxi Geology & Mineral Resources Development Bureau*



A large iron cluster was intercalated into the lays of montmorillonite via a facile cation exchange method. The SEM image shows that a few amorphous nano-fibre iron oxides were anchored on the surface of the intercalated montmorillonite.