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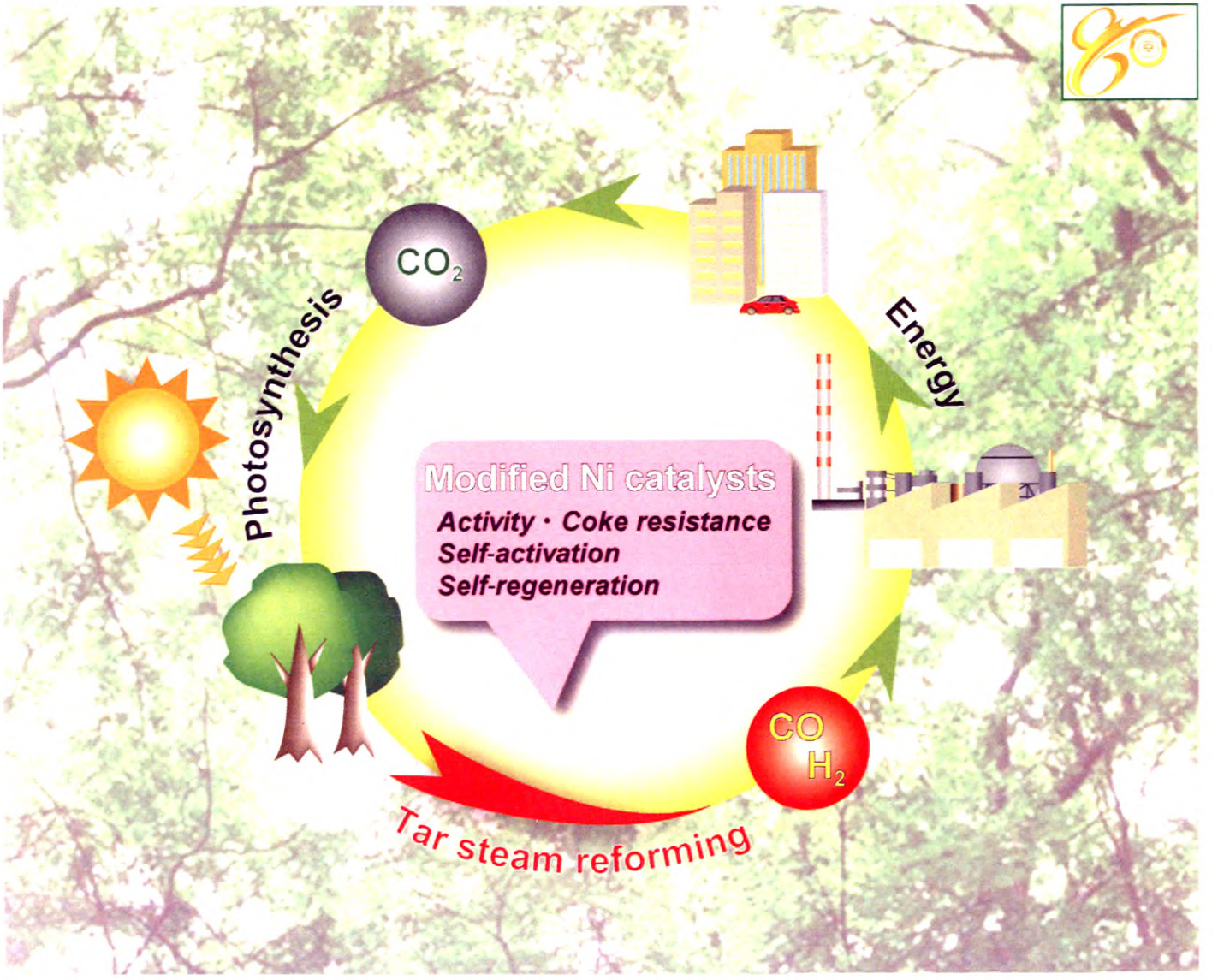

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Monthly Vol. 33 No. 4 April 2012

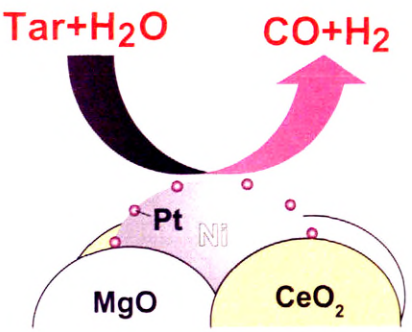
Contents

Review

Chin. J. Catal., 2012, 33: 583–594 doi: 10.1016/S1872-2067(11)60359-8

Development of Ni-Based Catalysts for Steam Reforming of Tar Derived from Biomass Pyrolysis

Dalin LI, Yoshinao NAKAGAWA, Keiichi TOMISHIGE*
Tohoku University, Japan; Fuzhou University, China



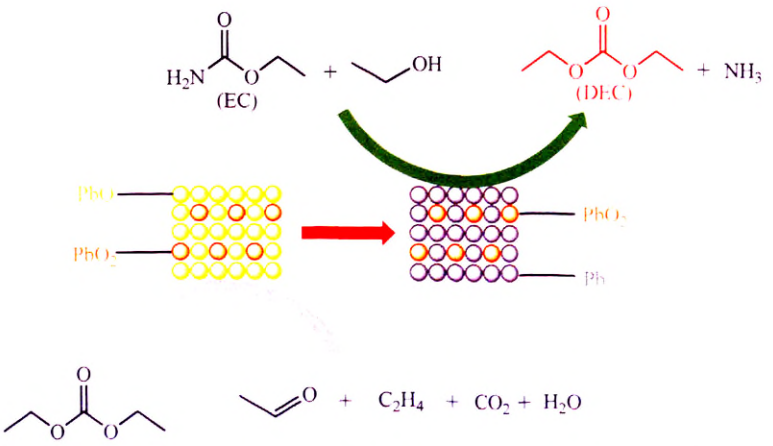
The development of multi-functional Ni catalysts for steam reforming of biomass tar was presented, and it may provide useful information toward the design of novel catalysts for the conversion of biomass to synthesis gas.

Communications

Chin. J. Catal., 2012, 33: 595–600 doi: 10.1016/S1872-2067(11)60373-2

Catalysis by Lead Oxide for Diethyl Carbonate Synthesis from Ethyl Carbamate and Ethanol

GUO Lian, ZHAO Xinqiang*, AN Hualiang, WANG Yanji
Hebei University of Technology

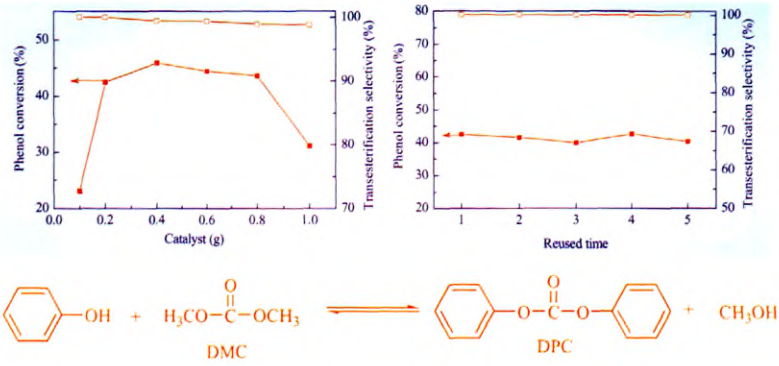


The reaction between diethyl carbonate (DEC) and PbO is responsible for the reduction of PbO to metal Pb, and a mixture of cubic metal Pb and orthorhombic PbO_2 is the real active component for DEC synthesis.

Chin. J. Catal., 2012, 33: 601–604 doi: 10.1016/S1872-2067(11)60381-1

Transesterification of Phenol and Dimethyl Carbonate Catalyzed by Titanium Oxide Acetylacetonate Catalyst

LI Bijing, TANG Rongzhi, CHEN Tong*, WANG Gongying
Chengdu Institute of Organic Chemistry, Chinese Academy of Sciences



Titanium oxide acetylacetonate is a highly efficient and stable heterogeneous catalyst with greater than 99.9% selectivity in the transesterification of phenol and dimethyl carbonate to diphenyl carbonate.

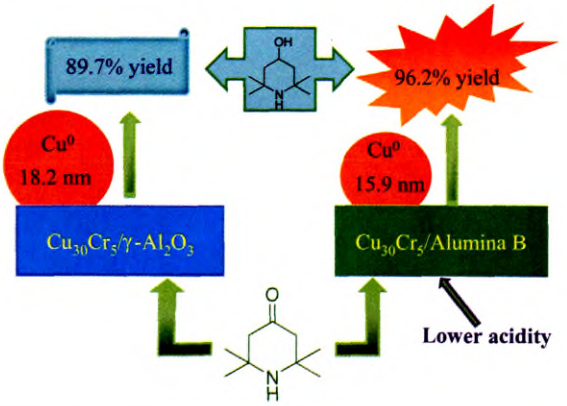
Articles

Chin. J. Catal., 2012, 33: 605–609 doi: 10.1016/S1872-2067(11)60341-0

Hydrogenation of 2,2,6,6-Tetramethylpiperidin-4-one over $Cu_{30}Cr_5$/Basic Alumina

MA Jianchao, LIU Shuai, FAN Xiaopeng, DU Xiaobao, YAN Xilong*, CHEN Ligong*
Tianjin University

Cu particles in $Cu_{30}Cr_5$/basic alumina (alumina B) dispersed better compared with $Cu_{30}Cr_5/\gamma$-Al_2O_3 and the acidic capacity of the support decreased. These resulted in higher selectivity and conversion.

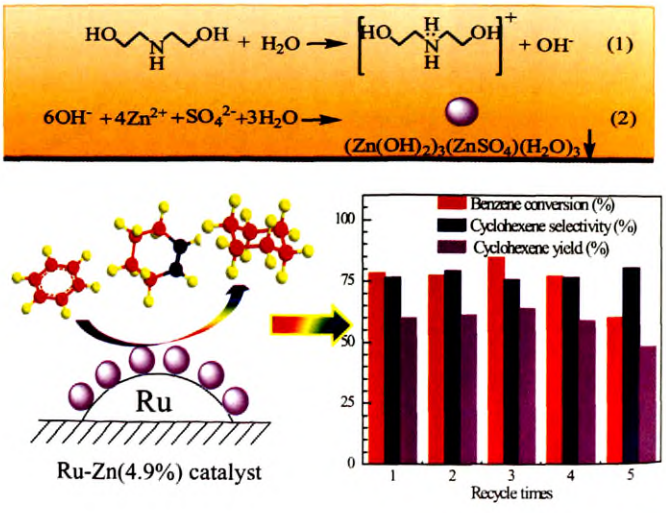


Chin. J. Catal., 2012, 33: 610–620 doi: 10.1016/S1872-2067(11)60351-3

Selective Hydrogenation of Benzene to Cyclohexene over a Ru-Zn Catalyst with Diethanolamine as an Additive

SUN Haijie, PAN Yajie, WANG Hongxia, DONG Yingying, LIU Zhongyi*, LIU Shouchang
Zhengzhou University

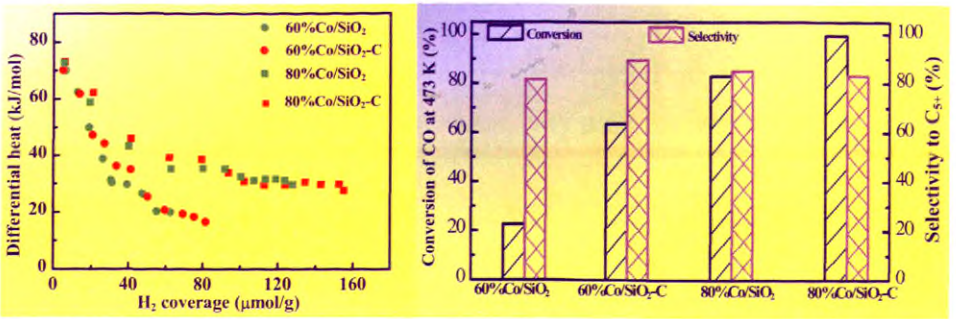
With a diethanolamine dosage of 0.3 g, $(Zn(OH)_2)_3(ZnSO_4)(H_2O)_3$ was promoted to be highly dispersed on a Ru-Zn(4.9%) catalyst and ZrO_2 particles, and this gave a cyclohexene selectivity and yield of 75.5% and 63.6%, respectively, at the benzene conversion of 84.3%.



Chin. J. Catal., 2012, 33: 621–628 doi: 10.1016/S1872-2067(11)60342-2

Effect of Resorcinol Formaldehyde Resin Gel on the Preparation of Co/SiO_2 Catalysts for Fischer-Tropsch Synthesis

CHEN Liang, SHEN Jianyi*
Nanjing University

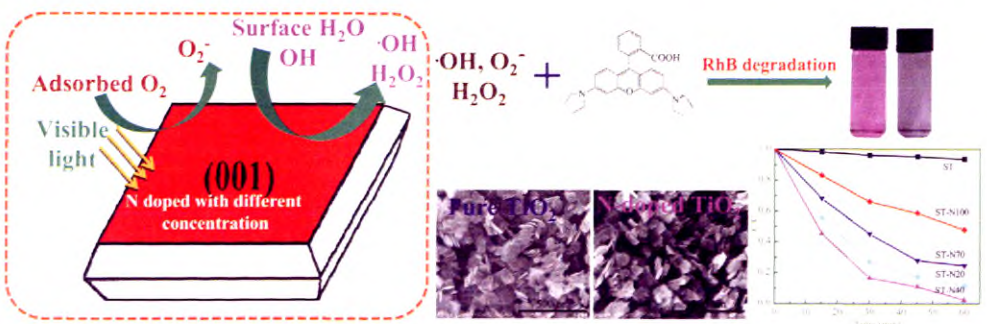


Addition of resorcinol formaldehyde resin gel promoted the reducibility and dispersion of supported cobalt, leading to the more surface active cobalt sites, and therefore the higher activity for Fischer-Tropsch reactions.

Chin. J. Catal., 2012, 33: 629–636 doi: 10.1016/S1872-2067(11)60348-3

Synthesis, Characterization, and Nitrogen Concentration Depended Visible-Light Photoactivity of Nitrogen-Doped TiO_2 Nanosheets with Dominant (001) Facets

WANG Wei, LU Chunhua*, SU Mingxing, NI Yaru, XU Zhongzi*
Nanjing University of Technology



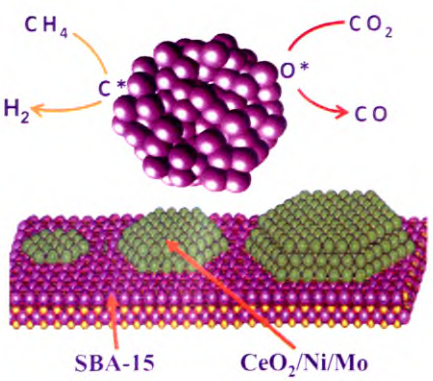
The visible-light photocatalytic activity of N doped TiO_2 nanosheets depends on the (001) facets and N doped level which affects the photogenerated h^+-e^- recombination rate and ·OH generation ability.

Chin. J. Catal., 2012, 33: 637–644 doi: 10.1016/S1872-2067(11)60347-1

Characterization and Catalytic Activity of CeO_2-Ni/Mo/SBA-15 Catalysts for Carbon Dioxide Reforming of Methane

HUANG Jian, MA Renxiong, GAO Zhihua, SHEN Chaofeng, HUANG Wei*
Taiyuan University of Technology;
Institute of Engineering Thermophysics, Chinese Academy of Sciences;
Yuncheng University

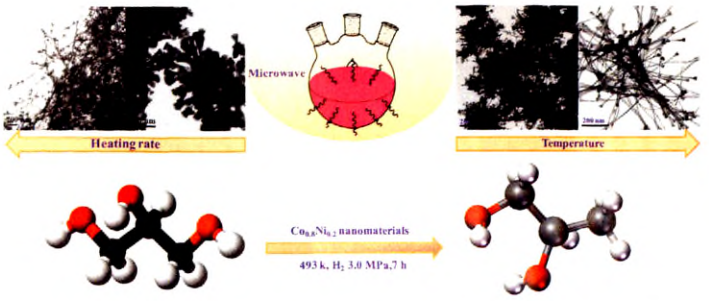
CeO_2/Ni/Mo/SBA-15 catalysts have good stability in CO_2 reforming of methane. The addition of CeO_2 into Ni/Mo/SBA-15 enhanced the catalytic activity and coke resistance of the catalyst.



Chin. J. Catal., 2012, 33: 645–650 doi: 10.1016/S1872-2067(11)60350-1

Microwave-Assisted Polyol Synthesis of CoNi Nanomaterials

GUO Xiaohui, LI Yong, LIU Qiying, SHEN Wenjie*
Dalian Institute of Chemical Physics, Chinese Academy of Sciences

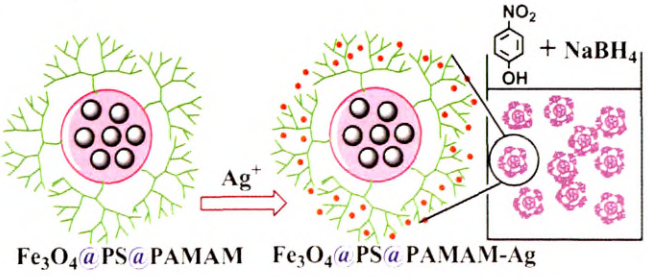


$Co_{0.8}Ni_{0.2}$ nanourchins and nanowires were fabricated by microwave-assisted polyol synthesis. Their catalytic activity in glycerol hydrogenolysis depended on their anisotropic shape and particle size.

Chin. J. Catal., 2012, 33: 651–658 doi: 10.1016/S1872-2067(11)60369-0

Fe_3O_4@PS@PAMAM-Ag Magnetic Nanocatalysts and Their Recoverable Catalytic Ability

DANG Gaofei, SHI Yan*, FU Zhifeng, YANG Wantai
Beijing University of Chemical Technology

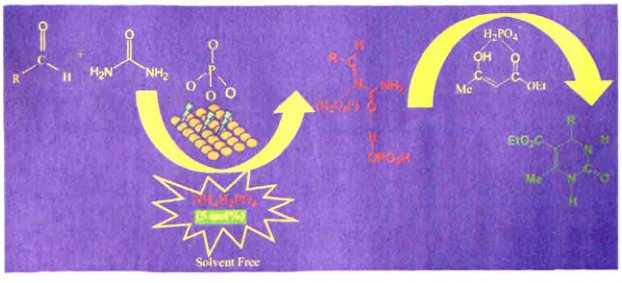


A method to prepare magnetic polystyrene microspheres grafted with a dendritic PAMAM-Ag shell and an investigation of their recoverable catalytic activity are presented.

Chin. J. Catal., 2012, 33: 659–665 doi: 10.1016/S1872-2067(11)60355-0

Ammonium Dihydrogen Phosphate ($NH_4H_2PO_4$) Catalyst for One-Pot Synthesis of 3, 4-Dihydropyrimidin-2(1*H*)-ones

Reza TAYEBEE*, Behrooz MALEKI, Malihe GHADAMGAHI
Hakim Sabzevari University, Iran

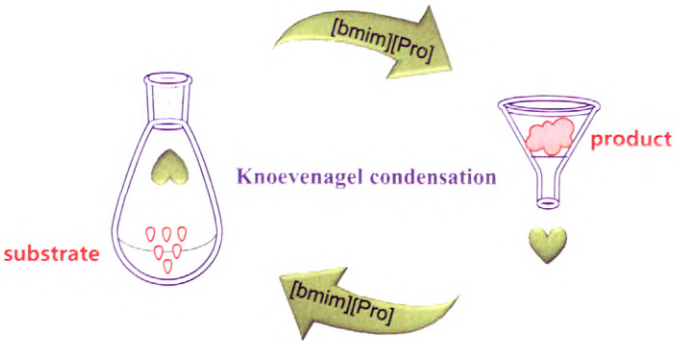


A simple and environmentally benign protocol for the preparation of 3,4-dihydropyrimidin-2-(1*H*)-ones under solvent-free conditions using easily available ammonium dihydrogen phosphate ($NH_4H_2PO_4$) as catalyst is shown.

Chin. J. Catal., 2012, 33: 666–669 doi: 10.1016/S1872-2067(11)60364-1

2-Pyrrolidinecarboxylic Acid Ionic Liquid Catalyzed Knoevenagel Condensation

SONG Hongbing, YU Yinghao, CHEN Xuewei, LI Xuehui*, XI Hongxia
South China University of Technology



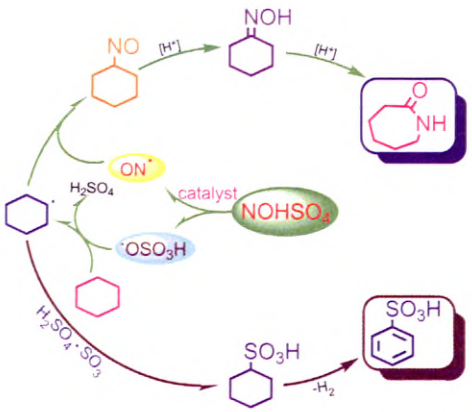
The pyrrolidinecarboxylic functionalized ionic liquid, 1-butyl-3-methylimidazolium-(*S*)-2-pyrrolidinecarboxylic acid salt ([bmim][Pro]), was prepared and shown to be highly active for the catalytic synthesis of α,β-unsaturated carbonyl compounds.

Chin. J. Catal., 2012, 33: 670–676 doi: 10.1016/S1872-2067(11)60354-9

One-Step Cyclohexane Nitrosation to ε-Caprolactam over Metal Substituted AlPO-5

HAO Fang, ZHONG Jun, LIU Pingle*, YOU Kuiyi, WEI Chao, LUO He'an
Xiangtan University; Changsha University of Science & Technology

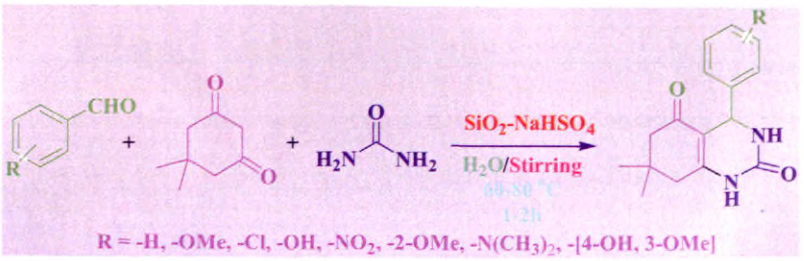
Metal substituted AlPO-5 catalyzed nitrosyl sulfuric acid decomposition and the stronger Brønsted acid sites result in nitrosocyclohexane rearrangement to ε-caprolactam.



Chin. J. Catal., 2012, 33: 677–680 doi: 10.1016/S1872-2067(11)60366-5

SiO_2-$NaHSO_4$ as an Efficient Reusable Heterogeneous Catalyst for the One-Pot Three-Component Synthesis of Octahydro-quinazolin-2,5-diones in Water

Sadeq Hamood Saleh AZZAM, Aisha SIDDEKHA, Aatika NIZAM, Mohamed Afzal PASHA*
Bangalore University, India; Central Institute of Home Science, India

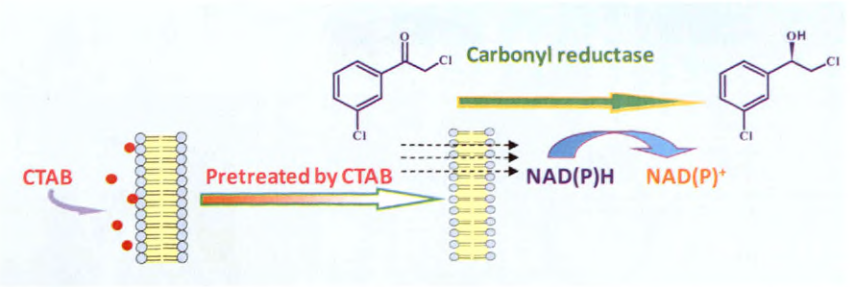


A rapid and environmentally benign method for the synthesis of octahydro-quinazolin-2,5-diones by the reaction of aromatic aldehydes, dimedone, and urea in the presence of SiO_2-$NaHSO_4$ is reported. SiO_2-$NaHSO_4$ acts as an efficient, mild, and recyclable heterogeneous catalyst to give excellent yield of the products within a short reaction time in water at 60–80 °C.

Chin. J. Catal., 2012, 33: 681–687 doi: 10.1016/S1872-2067(11)60363-X

Efficient Synthesis of (*R*)-2-Chloro-1-(3-chlorophenyl)ethanol by Permeabilized Whole Cells of *Candida ontarioensis*

NI Ye*, ZHANG Beihua, SUN Zhihao
Jiangnan University

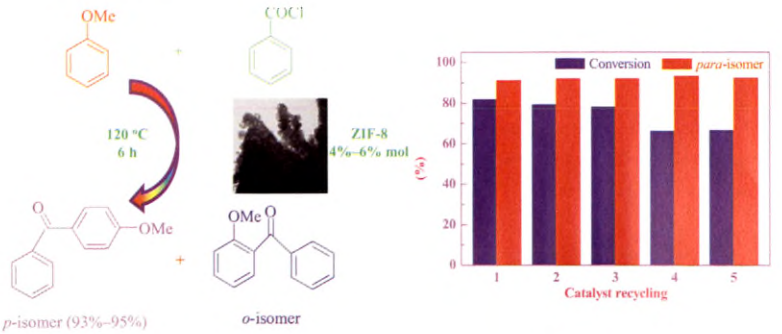


The catalytic efficiency of cetyltrimetylammonium bromide (CTAB)-permeabilized *Candida ontarioensis* whole cells has been significantly enhanced. The reaction time for the asymmetric synthesis of (*R*)-2-chloro-1-(3-chlorophenyl)ethanol was reduced from 72 to 24 h.

Chin. J. Catal., 2012, 33: 688–696 doi: 10.1016/S1872-2067(11)60368-9

A Zeolite Imidazolate Framework ZIF-8 Catalyst for Friedel-Crafts Acylation

Lien T. L. NGUYEN, Ky K. A. LE, Nam T. S. PHAN*
Hochiminh University of Technology, Viet Nam

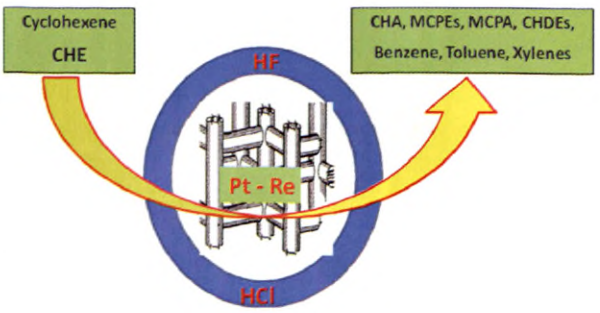


A zeolite imidazolate framework, ZIF-8, was used as catalyst for Friedel-Crafts acylation of anisole with benzoyl chloride.

Chin. J. Catal., 2012, 33: 697–705 doi: 10.1016/S1872-2067(11)60372-0

Effect of Hydrohalogenation of PtRe/H-ZSM-5 for Cyclohexene Hydroconversion

Sameh M. K. ABOUL-FOTOUH*, Noha A. K. ABOUL-GHEIT
Ain-Shams University, Egypt;
Egyptian Petroleum Research Institute, Egypt



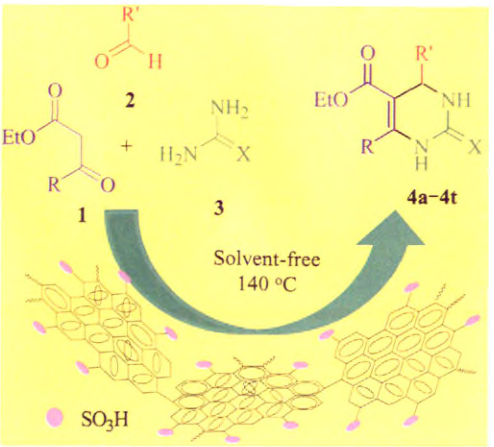
Rhenium is the most prevailing promoter for platinum in the naphtha catalytic reforming catalysts used for octane number improvement. An additional promotion of acidity by HCl or HF has also been examined in cyclohexene hydroconversion as a model reaction to explore the activation of intermediate reaction steps producing isomerized as well as hydrogenated, dehydrogenated, and hydrocracked products.

Chin. J. Catal., 2012, 33: 706–710 doi: 10.1016/S1872-2067(11)60377-X

Sulfonated Carbon Catalyzed Biginelli Reaction for One-Pot Synthesis of 3,4-Dihydropyrimidin-2(1*H*)-ones and -thiones

Maryam MOGHADDAS, Abolghasem DAVOODNIA*,
Majid M. HERAVI, Niloofar TAVAKOLI-HOSEINI
Mashhad Branch, Islamic Azad University, Iran;
Alzahra University, Iran

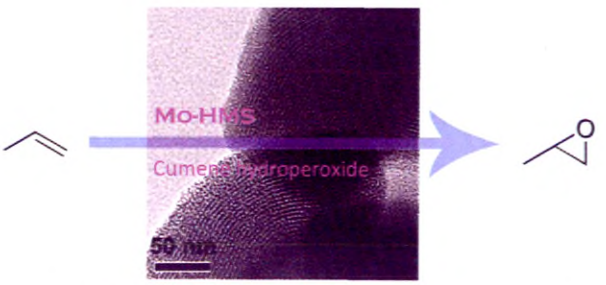
A very simple and efficient method for the synthesis of dihydropyrimidin-2(1*H*)-ones and -thiones by the Biginelli reaction of β-ketoesters, aldehydes, and urea or thiourea with sulfonated carbon as a recyclable solid acid catalyst under solvent-free conditions is described.



Chin. J. Catal., 2012, 33: 711–716 doi: 10.3724/SP.J.1088.2012.11031

Synthesis of Mo-HMS and Its Catalytic Performance in Liquid Epoxidation of Propylene

MIAO Yongxia*, YANG Xinli, GUO Lihong
Henan University of Technology

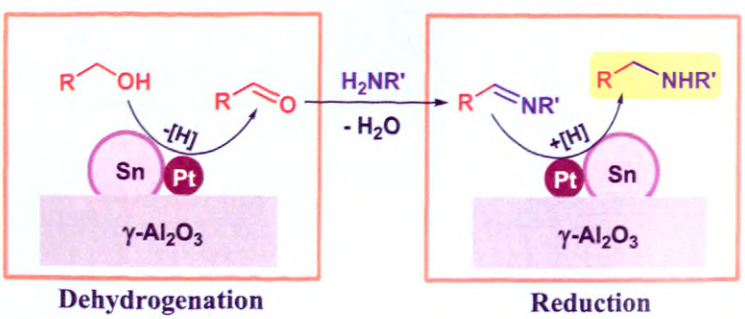


Mo-HMS synthesized by a one-step hydrothermal method has better catalytic performance than MoO_3/HMS prepared by impregnation and MoO_3/SiO_2 prepared by the sol-gel method, which is due to the higher dispersion of Mo species in Mo-HMS.

Chin. J. Catal., 2012, 33: 717–722 doi: 10.3724/SP.J.1088.2012.11105

Heterogeneous Bimetallic Pt-Sn/γ-Al_2O_3 Catalyzed *N*-Alkylation of Amines: Efficient Synthesis of Secondary and Tertiary Amines

HE Wei, HE Songbo, SUN Chenglin, WU Kaikai, WANG Liandi, YU Zhengkun*
Dalian Institute of Chemical Physics, Chinese Academy of Sciences

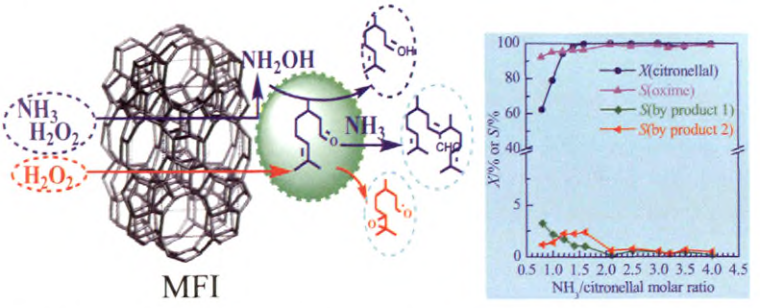


Direct synthesis of secondary and tertiary amines from the *N*-alkylation of amines with alcohols has been efficiently realized with the heterogeneous bimetallic Pt-Sn/γ-Al_2O_3 catalyst through a "borrowing hydrogen" strategy.

Chin. J. Catal., 2012, 33: 723–729 doi: 10.3724/SP.J.1088.2012.11019

Ammoximation of Citronellal with H_2O_2 Catalyzed by TS-1

ZHANG Shuo, DENG Xiujuan, SHEN Lu, LIU Yueming*
East China Normal University

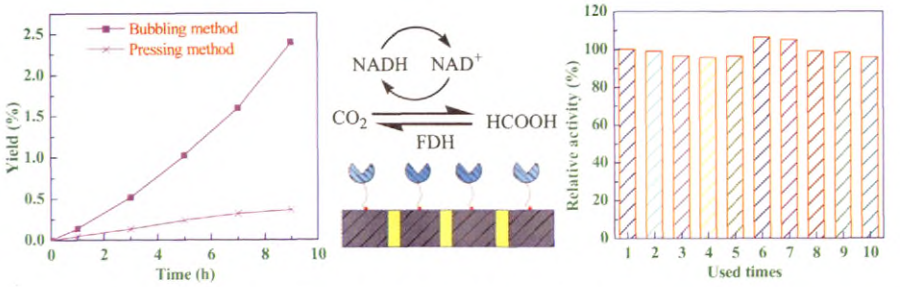


Citronellal oxime has been efficiently synthesized in the TS-1/H_2O_2 system. Aldol condensation is competitive with ammoximation, while the epoxidation and ammoximation of citronellal catalyzed by TS-1 are competitive. The amount of ammonia is the dominant factor affecting the ammoximation.

Chin. J. Catal., 2012, 33: 730–735 doi: 10.3724/SP.J.1088.2012.11024

Synthesis of Formic Acid from CO_2 Catalyzed by Formate Dehydrogenase Immobilized on Hollow Fiber Membrane

LIU Wenfang , HOU Benxiang, HOU Yanhui, ZHAO Zhiping*
Beijing Institute of Technology



Formate dehydrogenase was covalently attached to polyethylene (PE) membrane and then applied to catalyze the reduction of CO_2 to formic acid. Enzyme activity reached 0.138 mmol/(L·h). PE-attached FDH exhibited outstanding stability.

Chin. J. Catal., 2012, 33: 736–742 doi: 10.3724/SP.J.1088.2012.11121

Synthesis of Dimethyl Carbonate from Oxidative Carbonylation of Methanol Catalyzed by Cu(phen)Cl_2

DU Zhiping*, ZHOU Bin, HUANG Liming, HUANG Chen, WU Yuanxin, WANG Chunwen, SUN Wei
Wuhan Institute of Technology

Cu(phen)Cl_2 has higher thermostability and exhibits the unique active change trend in oxidative carbonylation of methanol to dimethyl carbonate, which is correlated to the new reaction mechanism.