

石 油 学 报

(石油加工)

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* 封面文章

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万方数据

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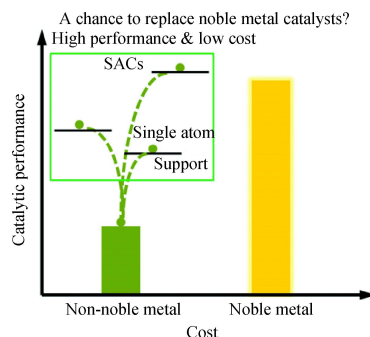
Special Articles

Acta Petrolei Sinica (Petroleum Processing Section), 2018, 34(4): 0639-0650 doi: 10.3969/j.issn.1001-8719.2018.04.001

Recent Advances in Non-Noble Metal Single Atom Catalysts

WU Genghuang HUANG Huang RONG Junfeng DA Zhijian

Non-noble metal single atom catalysts (SACs) exhibited catalytic activity and selectivity comparable and even superior to noble metal catalysts in some specific reactions with great potential for industrial applications.

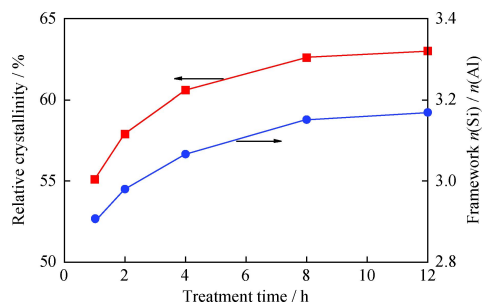


Acta Petrolei Sinica (Petroleum Processing Section), 2018, 34(4): 0651-0657 doi: 10.3969/j.issn.1001-8719.2018.04.002

Changes of Crystallinity During Dealumination of NaY Zeolite by Oxalic Acid

WANG Zijian FU Qiang ZHANG Chengxi LI Yongxiang

The influences of acid treatment conditions on crystallinity of NaY zeolite were studied. It is found that prolonging treatment time and increasing the liquid/solid ratio (keeping the dosage of oxalic acid as a constant) is helpful to maintain high crystallinity, without affecting the degree of dealumination.



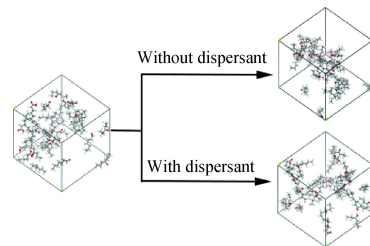
Research Articles

Acta Petrolei Sinica (Petroleum Processing Section), 2018, 34(4): 0658-0664 doi: 10.3969/j.issn.1001-8719.2018.04.003

Molecular Dynamics Simulation on the Effect of Dispersants on the Aggregation of Lubricant Oxidation Products

XIA Lei LONG Jun ZHAO Yi WU Zhiqiang DAI Zhenyu WANG Lihua

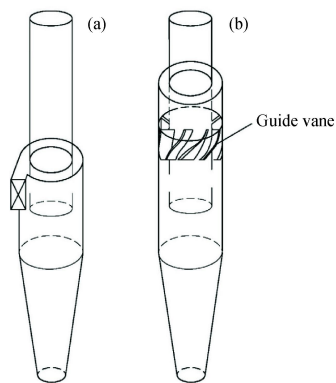
We investigate herein the aggregation of lubricant oxidation products and the effect of dispersants, polyisobutylene succinimide, on that by molecular dynamics simulation. Lubricant oxidation products could gradually gather by hydrogen bonds, however, it could be prevented by dispersants through space barrier and forming stronger hydrogen bonds between them.



Contrast Studies on Cyclone Performances With Two Different Inlet Types

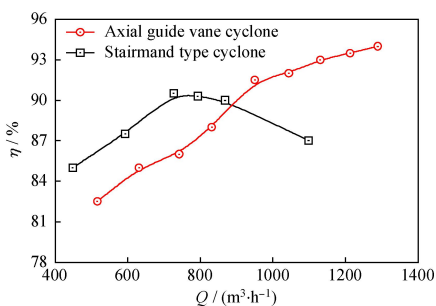
ZHOU Faqi SUN Guogang HAN Xiaopeng LOU Zhihua WEI Qing

Contrast studies on separation performance and flow field in tangential inlet and axial inlet guide vane cyclones were implemented with more wide range of inlet velocity than literatures experimentally and numerically. Different trends in collection efficiency with flow rate of two separators were discussed.



(a) Stairmand type cyclone separator with tangential inlet ;

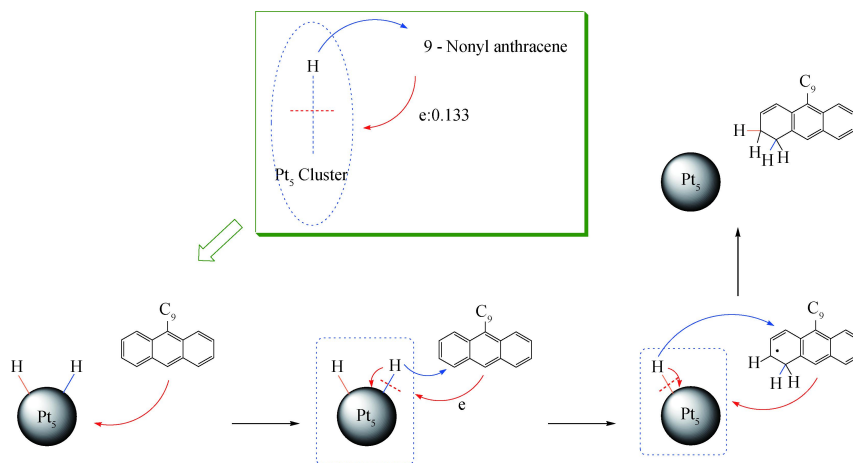
(b) Guide vane cyclone separator with axial inlet



Orbital Interaction Mechanism of Hydrogen and 9-Nonylanthracene Adsorption and Dissociation on Platinum Cluster

WANG Chunlu REN Qiang ZHAO Yi ZHAO Xiaoguang WANG Lixin YE Weizhen DAI Zhenyu ZHOU Han LONG Jun

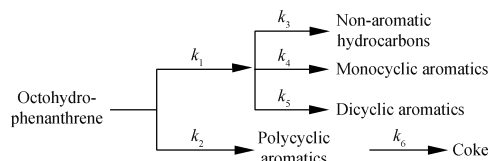
Periodic density function theory (DFT) and molecular dynamic method are combined to investigate the adsorption and dissociation of 9-nonyl anthracene and H_2 on nano Pt_5 clusters, including both physisorption and chemisorption. Consequently, a clear orbital interaction mechanism of the adsorption of PAHs on Pt_5 clusters is obtained.



Kinetics of Octohydrophenanthrene Highly Selective Catalytic Cracking

TANG Jinlian

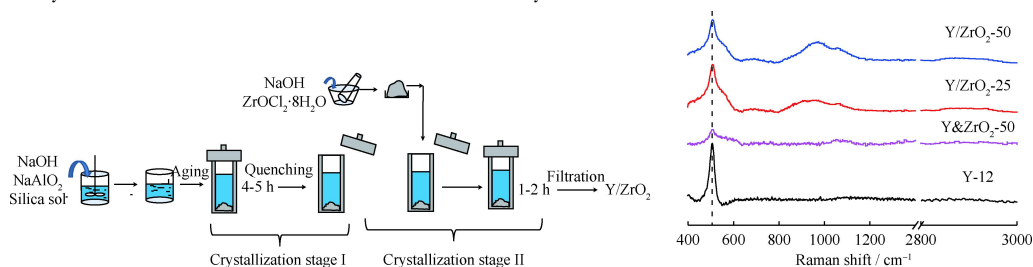
The kinetics study on highly selective catalytic cracking (HSCC) of octohydrophenanthrene was carried out in a FFB unit. The six-lumping kinetic model of Langmuir-Hinshelwood (L-H) type for describing the catalytic cracking behavior of octohydrophenanthrene was developed. The activation energy of the naphthenic ring opening reactions of octohydrophenanthrene and dehydrogenation condensation reactions are 70.63 J/mol (ΔE_1) and 48.71 J/mol (ΔE_2), respectively.



Preparation of Hierarchical Y/ZrO₂ Composite

LIU Wanrong LIU Xinmei XIN Ying XU Lu HU Qingxun ZHANG Zhongdong

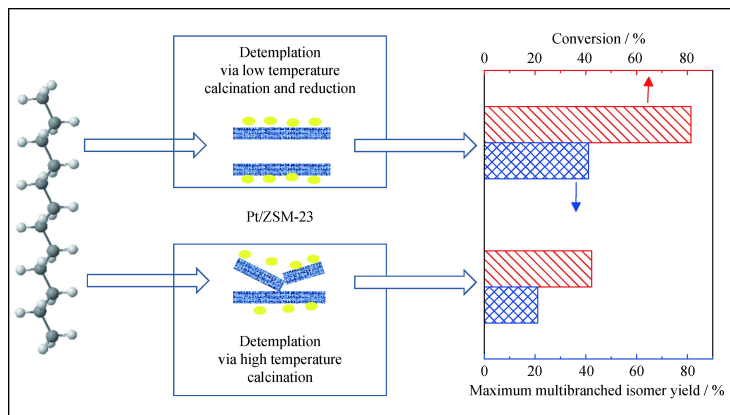
The hierarchical Y/ZrO₂ composite was successfully prepared by two-stage hydrothermal crystallization method. Y zeolite and ZrO₂ are bonded by chemical bonds in Y/ZrO₂, which is essentially different from the mechanical mixture of Y zeolite and ZrO₂.



Effects of Detemplation Method on the Catalytic Performance of Pt/ZSM-23 in *n*-Alkane Isomerization

LÜ Guang LIU Zhongshan WANG Congxin MA Huaijun QU Wei WANG Dong'e TIAN Zhijian

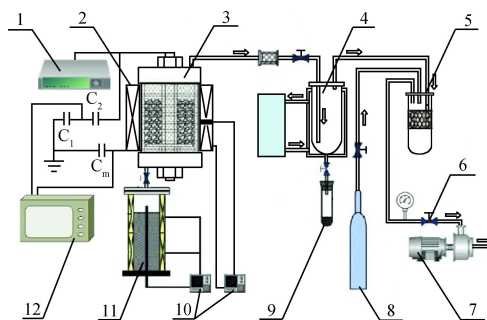
Compared with Pt/ZSM-23 catalyst detemplated via calcination at high temperature (560°C), Pt/ZSM-23 detemplated via coupling low temperature (350°C) calcination and 400°C reduction possesses more Brønsted acid sites and larger micropore volume, thus it exhibits higher activity and multibranched isomer yield in *n*-dodecane hydroisomerization reaction.



In-situ Catalytic Cracking of Bio-Oil by Employing Ti/HZSM-5 Under NPSC System

FAN Yongsheng ZHAO Weidong CAI Yixi LI Xiaohua
CHEN Yuwei JIN Lizhu

A non-thermal plasma synergistic catalytic (NPSC) system was established, and in-situ catalytic cracking of bio-oil was studied by using Ti/HZSM-5 under NPSC system. The synergistic action of non-thermal plasma technology enhanced the deoxidization performance of Ti/HZSM-5 significantly and reduced the PAHs obviously, but the catalytic stabilization deteriorated to some extent.



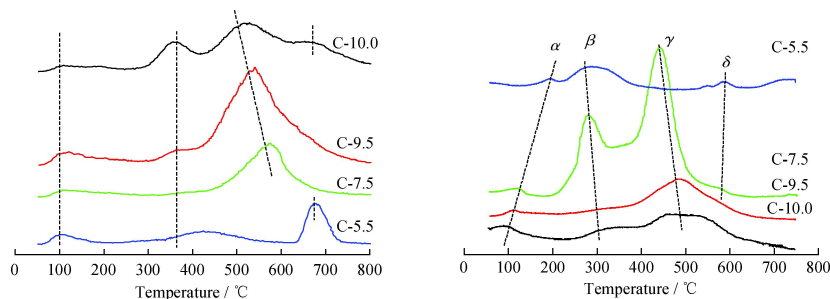
NPSC system for in-situ catalytic cracking of bio-oil

1. Power supply ; 2. Heating sleeves ; 3. NPSC reactor ;
4. Cooling tower ; 5. Pressure stabilizing tube ;
6. Pressure regulating valve ; 7. Vacuum pump ; 8. Nitrogen cylinder ;
9. Bio-oil collector ; 10. Temperature controller ;
11. Pyrolysis reactor ; 12. Oscilloscope

Effect of pH Value on the Catalytic Performance of CuZnAl-LDHs Catalysts in the Synthesis of C₂₊ Alcohols

LIU Yan GAO Zhihua HAO Shuhong LI Shuaishuai HUANG Wei

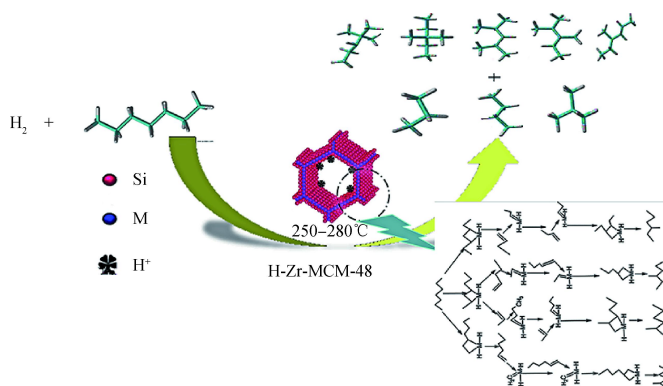
The pH value has a great influence on the surface base strength and the adsorption capacity of CO of CuZnAl catalysts. And the results show that appropriate ratio of the medium and strong base and appropriate dissociation and non-dissociation of CO are favorable for C₂₊ alcohols synthesis.



Synthesis of H-Zr-MCM-48 and Its Application in n-Heptane Isomerization

WANG Jian MA Shoutao ZHANG Wei
SUO Yanhua WANG Yingjun

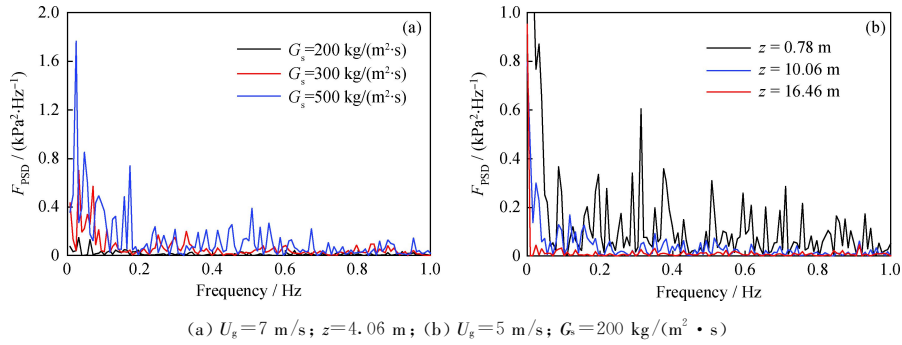
Product analysis shows that various C₇ isomers are formed in n-heptane isomerization reaction, including 2-methylhexane (2-MH), 3-methylhexane (3-MH), 2,2-dimethylpentane (2,2-DMP), 2,3-dimethylpentane (2,3-DMP), 2,4-dimethylpentane (2,4-DMP), and 3,3-dimethylpentane (3,3-DMP) etc.



Power Spectral Density Analysis of Pressure Signal in an 18 m Circulation Fluidized Bed Riser

PEI Huajian WANG Chengxiu LAN Xingying GAO Jinsen XU Chunming

Power spectral density method is applied to analyse the pressure data in a riser of diameter 80 mm and height 18 m. Results show that the pressure signal fluctuation is mainly affected by gas-solids interaction, which included gas-solids friction, particle-particle collision and particle-particle aggregation. Pressure signal fluctuation intensity decreased gradually with the decreasing solids circulating rate and the increasing axial position of the riser.



Experimental Analysis of Dynamic Pressure in the Particle Circulating Loop of Circulating Fluidized Bed Reactor

SUN Liqiang XU Lihui HU Xia HE Jiao
GULIZHAINA · Habudula WEI Yaodong

Dynamic pressure measurement of three main units (i.e., fluidized bed, riser and cyclone dipleg) in an experimental circulating fluidized bed was carried out simultaneously to investigate the origin of fluctuating pressure in the CFB.

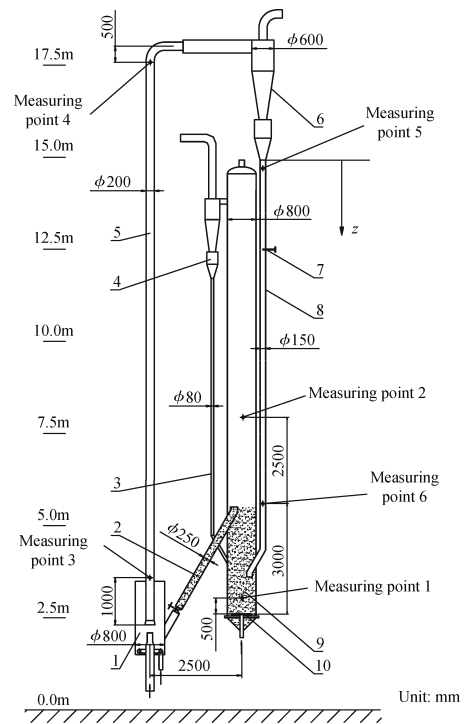
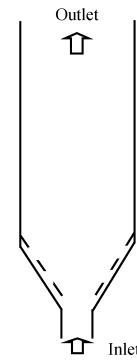


Diagram of experimental circulating fluidized bed
1-Pre-lift; 2-Inclined pipe; 3-Dipleg; 4-Cyclone; 5-Riser;
6-Cyclone; 7-Valve; 8-Dipleg; 9-Fluidized bed 10-Distributor

CFD Simulation of Gas-Solid Flow Behavior in a Spout-Fluidized Bed With Integral Multi-Nozzle Effect

ZHANG Xuan WU Feng MA Xiaoxun YANG Jian

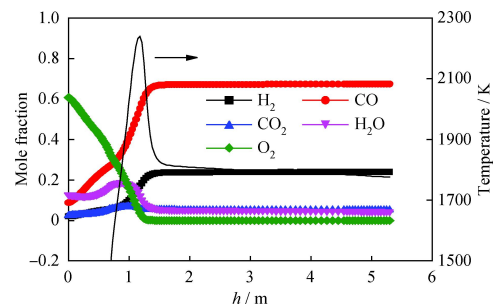
Based on the kinetic theory, the gas-solid flow behaviors of a novel integral multi-nozzle spout-fluidized bed were simulated by the TFM model. A number of slits are formed on the cone side of the spouted bed to form an auxiliary multi-nozzle structure, which produces an interference effect on the cone boundary.



Numerical Simulation and Optimization of Multi-Phase Turbulent Reactions in a Pulverized Coal Gasifier

SANG Lei FAN Jianjiang LI Ping FAN Hui RAN Xiaowen

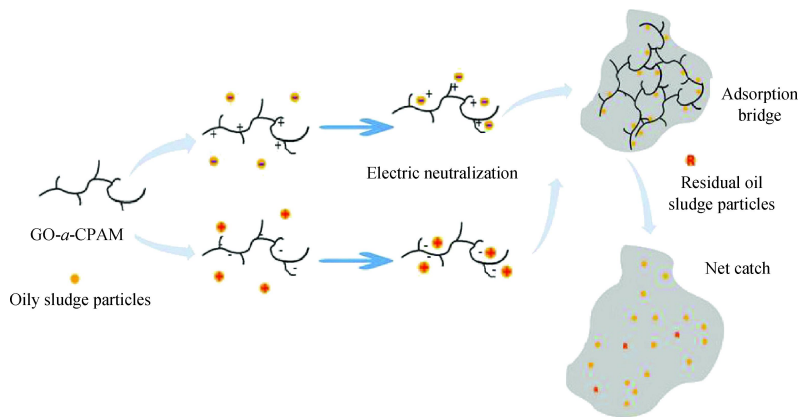
A 3D numerical simulation has been done for the GSP gasifier multi-phase turbulent reactions. The field of temperature, velocity and particle trajectories are discussed. The optimized operation parameters of swirl number, operation pressure and mass ratio of coal and oxygen are 1.20, 4.2 MPa and 1.3 respectively.



Synthesis, Flocculation and Oil Removal Performances of GO- α -CPAM Nanomaterials

CHEN Ying TIAN Gongwei LIANG Yuning GAO Yanhua

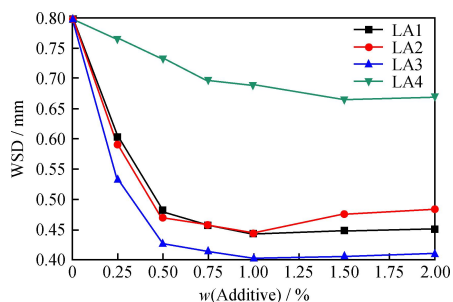
In this paper, we use Mixed acid and Hummers method to prepare GO- α (GO- α , $\alpha = (1, 2)$, Mixed acid method $\alpha = 1$, Hummers $\alpha = 2$), then synthesize GO- α -CPAM separately. The results showed that Mixed acid method makes GO-1-CPAM flocculation better than Hummers method, the flocculation performance of GO- α -CPAM and the removal oil of GO-1-CPAM are investigated.



Synthesis and Tribological Properties of Environmental Friendly N-containing Lubricant Additives

LU Hao DAI Kangxu CAO Hua ZHAO Hongbin HAN Lifan
YU Lei HU Jiaman ZHAO Caixian

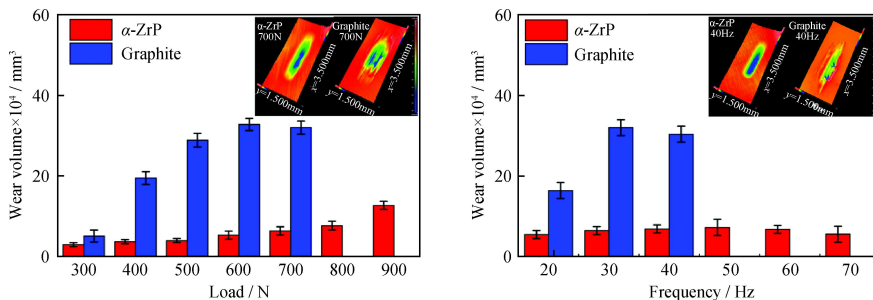
The anti-wear performances of four additives in liquid paraffin were evaluated with a four-ball machine. The anti-wear performance of liquid paraffin was significantly improved with four additives. The wear scar diameter of liquid paraffin with 1.0% LA3 was only half of the value observed in liquid paraffin.



Tribological Properties of Layered Zirconium Phosphate as an Additive in Anhydrous Calcium Grease

DAI Yingjing NIU Wenxing ZHANG Xiaosheng XU Hong DONG Jinxiang

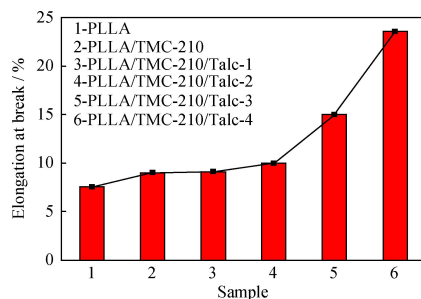
The tribological properties of α -ZrP and graphite as additives in anhydrous calcium grease were evaluated with a conventional reciprocating “ball-on-disk” mode of Optimol SRV-V tester. The results showed that α -ZrP exhibits good performance in load-carrying capacity, anti-wear and friction-reduction. α -ZrP is a potential lubricant additive.



Influence of TMC-210 and Talc Blends on Crystallization and Properties of PLLA

WU Xuejian LUO Faliang WANG Diran WANG Kezhi XING Qian

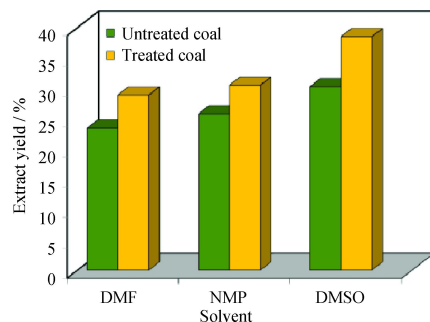
The fracture elongation of PLLA /TMC-210/Talc blends gradually increased with increasing of Talc content. The best elongation at break of 23.6% for the blend could obtain under the condition of adding 4% Talc and 0.2% TMC-210 and increased by 262% compared with PLLA /TMC-210 blends.



Impact on the Extraction Behaviors of the Yangchangwan Coal Induced by Different Solvents Extraction and Thermal Depolymerization by 1-ethyl-3-methylimidazole Acetate

WANG Yanmei LI Zhuangmei LI Ping BAI Hongcun

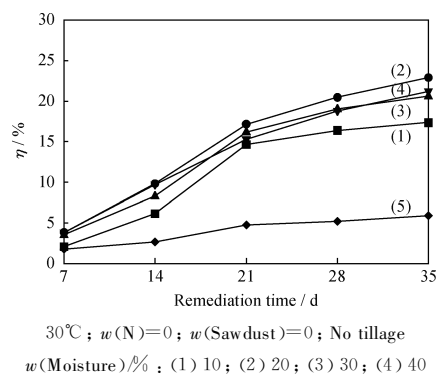
This work investigated the extraction behaviors of the Yangchangwan coal involved with different organic solvents and the ionic liquid 1-ethyl-3-methylimidazole acetate, [Emim][AC]. The solvent with larger polarizability was more favorable to extract the YCW coal for each series. The ionic liquid [Emim][AC] could enhance the yield obviously in solvent extraction of the coal.



Promoted White Rot Fungi by Biological Stimulation to Repair Petroleum Contaminated Soil

LI Zhenwei ZHANG Xiuxia ZHONG Zhesen SHANG Qionqiong WANG Lin

The best combination of parameters was obtained by single factor experiment. The variance analysis shows that the single factor has significant difference in the degradation rate of petroleum by white rot fungi. The final degradation rate of petroleum hydrocarbons under the optimum conditions is 41.87%.

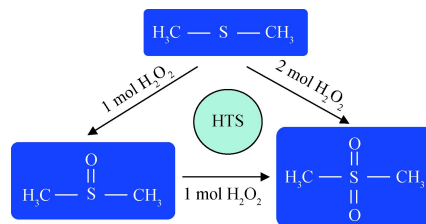


The 19th Chinese Zeolite Conference Articles

Catalytic Performance of Hollow Titanosilicate Zeolite in Dimethyl Sulfide Liquid Phase Oxidation Reaction

SHI Chunfeng LIN Min ZHU Bin MU Xuhong SHU Xingtian

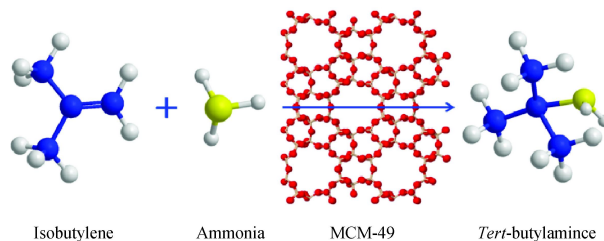
Simplified reaction route of dimethyl sulfide (DMS) catalytic oxidation with HTS / H₂O₂ in liquid phase under mild conditions is demonstrated. Converting of 1 mol DMS to 1 mol dimethyl sulfoxide (DMSO) needs 1 mol hydrogen peroxide (H₂O₂), while 1 mol DMS converting to 1 mol dimethyl sulfone (methyl sulfonyl methane, MSM) consumes 2 mol H₂O₂. When 1 mol DMSO converts to 1 mol MSM, 1 mol H₂O₂ is needed.



Amination of Isobutylene to *tert*-Butylamine Catalyzed by Modified MCM-49 Zeolite

GAO Shangyao JIANG Nan ZHU Xiangxue CHEN Fucun
XIE Sujuan WEI Huijuan LI Xiujie WANG Yuzhong AN Jie
LIU Shenglin XU Longya

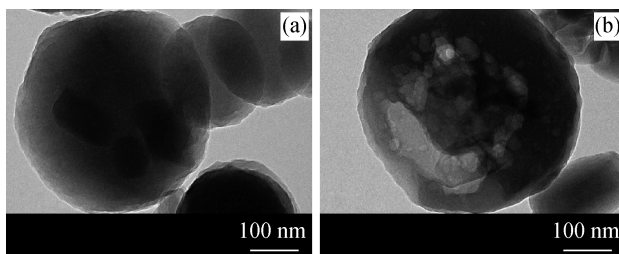
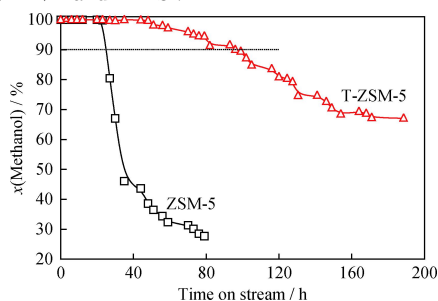
Direct amination of isobutylene over modified MCM-49 zeolite treated by NaOH and cetyltrimethylammonium bromide (CTAB) was studied under mild reaction conditions. The linear activity-acidity correlation provides good guidance for developing high-efficient amination catalyst available for industrial application.



Enhancing the Catalytic Performance of ZSM-5 Zeolite in Methanol to Propene Reaction via Recrystallization in the Presence of Tetraethylammonium Hydroxide

ZHANG Yunpeng LI Minggang WANG Ping XING Enhui LUO Yibin SHU Xingtian

Highly siliceous ZSM-5 was post-treated by tetraethylammonium hydroxide to generate intracrystalline mesopore, increased by more than 50%. The hierarchical T-ZSM-5 zeolite exhibits long catalytic lifespan of 100 hours, four times as that of parent ZSM-5 in MTP reaction, which is evaluated under the following operating conditions: $T = 480^\circ\text{C}$, $p = 0.1 \text{ MPa}$, $m(\text{Methanol})/m(\text{H}_2\text{O}) = 1/1$ and $\text{MHSV} = 4.5 \text{ h}^{-1}$.

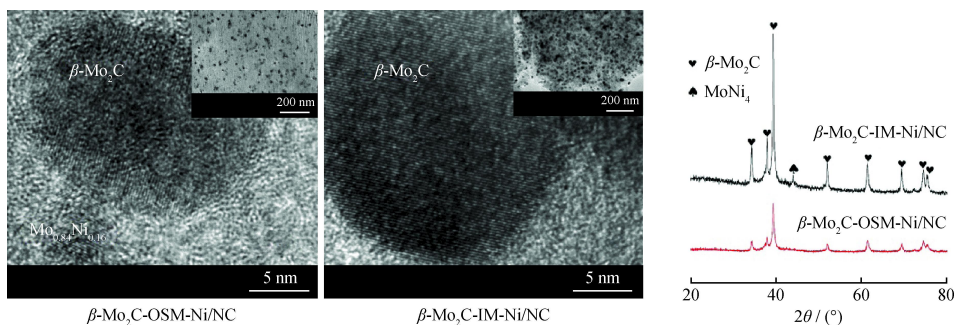


(a) ZSM-5; (b) T-ZSM-5

β -Mo₂C Catalysts Supported on Ni Modified Mesoporous Carbon Prepared by Different Methods and Their Application in CO Hydrogenation to Synthesize Mixed Alcohol

HU Ruijie ZHAO Nana LI Jiajia ZHANG Mandi LI Jianli SU Haiquan GU Xiaojun

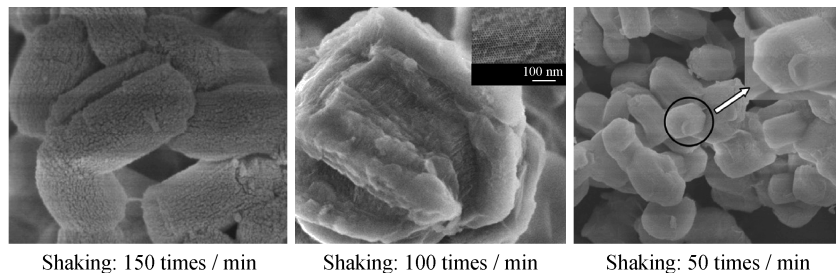
β -Mo₂C-OSM-Ni/NC catalyst has higher dispersion of active species on both support and pores than β -Mo₂C-IM-Ni/NC. In addition, the Mo_{0.84}Ni_{0.16} phase in β -Mo₂C-OSM-Ni/NC shows better catalytic activity than the MoNi₄ phase in β -Mo₂C-IM-Ni/NC, resulting in higher total alcohol selectivity.



Synthesis of Mesoporous Silica With Different Morphologies via a Shaking Method and Their Adsorption Property to Dye

WU Zhengying ZHU Wenjun YIN Xin QIAN Junchao ZHA Zhenlong WANG Dongtian ZHOU Xing CHEN Zhigang

Mesoporous SiO₂ with different morphologies was successfully prepared via a novel shaking method under mild reaction conditions. Morphology and structure of the material are well controlled by altering the shaking rate in initial step during the synthesis process.



Prussian Blue Embedded into Three-Dimensional Graphene Network Prepared by a Simplified Hydrothermal Method and Its Performance as Superior Sodium-Ion Battery Cathode

GONG Chun

A simplified low-temperature hydrothermal synthesis method was applied to decorate Prussian blue (PB) with graphene, overcoming the extremely poor thermal stability of PB. Enhanced obvious performance with a high specific capacity of 61 mAh/g at the current density of 50C was obtained via this method.

