



中文核心期刊 Ei核心期刊
本刊被Ei Compendex,CA,AJ,CBST,Scopus等
国际重要检索数据库收录

ISSN 1001-8719
CN 11-2129/TE
CODEN SXSHEY

石油学报 (石油加工)

ACTA PETROLEI SINICA
(PETROLEUM PROCESSING SECTION)



1985-2015

周年

ISSN 1001-8719



中国石油学会 主办
石油化工科学研究院 承办

2015

2
Vol.31

万方数据

石油学报

(石油加工)

第 31 卷 第 2 期 2015 年 4 月

目次

院士谈创新之路专栏

创新驱动发展途径之探讨	闵恩泽(203)
为创新铺路	汪燮卿(205)

创刊 30 周年特约综述

炼油工业:市场的变化与技术对策	李大东(208)
石油替代战略的综合分析	陈俊武(218)
核壳结构的沸石分子筛复合材料研究进展	薛招腾 唐雪婷 王文兴 赵东元(228)
创新芳烃工程设计开发与工业应用	孙丽丽(244)
络合制备技术在加氢催化剂中的应用	聂红 李会峰 龙湘云 李大东(250)
“973”计划推动我国石油化学工业可持续发展	宗保宁(259)
气体生物脱硫及硫回收研究进展	宋子煜 吴丹 董健 张建 李清方 邢建民 刘会洲(265)
芳烃联合装置生产技术进展及成套技术开发	吴巍(275)
分子水平重油表征技术开发及应用	田松柏 龙军 刘泽龙(282)
催化裂化(裂解)集总反应动力学模型研究进展	熊凯 卢春喜(293)
重油催化裂解制取丙烯的分子反应化学	谢朝钢 魏晓丽 龙军(307)
蒸馏技术在石油炼制工业中的发展与展望	从海峰 李洪 高鑫 李鑫钢(315)
无钠 Beta 分子筛的合成	王永睿 贾晓梅 余少兵 张凤美 慕旭宏 舒兴田(325)
多相 Mo 基催化剂上烯烃歧化反应	李秀杰 张大洲 辛文杰 朱向学 陈福存 谢素娟 刘盛林 徐龙伢(331)
钛硅分子筛的合成及其催化氧化反应研究进展	左轶 刘民 郭新闻(343)
分子模拟技术在炼油领域的应用	周涵 任强 龙军(360)
综述原位聚合法制备高性能聚乙烯基复合材料	何富安 张黎明(369)
钴系费-托合成催化剂的助剂及其作用	石玉林 林泉 李加波(390)
丙烷脱氢制丙烯催化剂研究的进展	张凌峰 刘亚录 胡忠攀 杨玉旺 于海斌 袁忠勇(400)
纳米催化剂在碳氢燃料和生物柴油领域中的应用	张传峰 赵静 方文军 郭永胜(418)
固体原料化学链技术研究进展与展望	罗四维 李军 张然 王芳杰 崔龙鹏(426)
渣油加工技术现状及发展趋势	钟英竹 靳爱民(436)
生物柴油催化合成的研究进展	应好 何桂金 张丽锋 雷群芳 郭永胜 方文军(444)

创刊 30 周年特约研究报告

从反应化学原理到工业应用 II. S Zorb 催化剂设计开发及性能	林伟 龙军(453)
废弃油脂与减压蜡油共催化裂化技术开发及工业试验	山红红 刘熠斌 陈小博 杨朝合(460)
植物油基润滑油添加剂的制备及其摩擦学性能	李维民 姜程 王晓波 刘维民(468)
汽油中芳烃对发动机排放的影响	张孝铭 张建荣 宋海清(476)
满足国 V 汽油标准的 RSDS-III 技术的开发及应用	高晓冬 张登前 李明丰 潘光成 聂红 李大东(482)

基于连续热力学分析的塔河常压渣油戊烷溶剂脱沥青	沈本贤	宁爱民	仝玉军	刘纪昌(487)
重质油催化工艺多产乙烯过程中污染铁对催化剂性能发挥的影响	许 昀	田辉平	邵新军(497)	
氧化镍改性的 ZSM-5 催化剂对甲苯和甲醇择形甲基化反应稳定性的影响				
.....	谭 伟	侯珂珂	刘 氏	李文慧
	刘海鸥	宋春山	郭新闻(503)	
邻甲酚加氢脱氧还原型催化剂的实验研究	桑小义	李会峰	李大东	李明丰(523)
Pd/H β 和 Pd/Ce- β 在水相苯酚加氢脱氧反应中的催化性能				
.....	遇治权	王福俊	徐晓瑀	王 瑶
	李 翔	王安杰(529)		
基于 Y 型沸石的解聚制备 ZSM-5/Y 沸石催化材料				
.....	潘 梦	刘宇键	郑家军	李 彪
	张鸿雁	易玉明	田辉平	李瑞丰(535)
以活性炭为载体制备 Pd 和 Pt 加氢脱硫催化剂	董 超	李 翔	王安杰	陈永英(542)
纳米晶堆积多级结构 ZSM-5 分子筛的设计合成及其催化甲醇制丙烯反应性能				
.....	栗文龙	马 通	尹 琪	顾洪歌
	吴志杰	窦 涛(550)		
稀释气对甲醇制丙烯反应产物的影响				
.....	蒋斌波	严丽霞	魏令泽	冯 翔
	廖祖维	黄正梁	王靖岱	阳永荣
	汪燮卿(556)			
油砂沥青油的加工利用	王雅兰	张会成	关明华	徐志扬
	何 冰	杜彦民(563)		
典型高酸原油乳化原因与破乳新方法	李本高	王 嵩	谭 丽(568)	
考虑产汽的延迟焦化装置分馏与换热过程集成优化	雷 杨	陈晓忠	张冰剑	陈清林(572)
生物基抗磨剂和热轧油的研制	段庆华	兰晓艳	黄作鑫	陈 政(583)
不锈钢基材上 α -轴取向 ZSM-5 分子筛涂层的制备及其形成机理	厉 刚	匡 野	胡申林(589)	
超临界 CO ₂ 在有机液体中的分散	杨子浩	林梅钦	董朝霞	李明远(596)

信息

《石油学报(石油加工)》征订启事(292); 关于《石油学报(石油加工)》网上投稿的特别声明(417); 《China Petroleum Processing and Petrochemical Technology》征订启事(481); 《石油炼制与化工》征订启事(502); Ei 对中英文摘要的要求(562)

期刊基本参数: CN11-2129/TE * 1985 * b * A4 * 400 * zh+en * P * ¥20.00 * 1200 * 45 * 2015-04 本期责任编辑: 杨华英

ACTA PETROLEI SINICA

(PETROLEUM PROCESSING SECTION)

Vol. 31 No. 2 Apr. 2015

CONTENTS

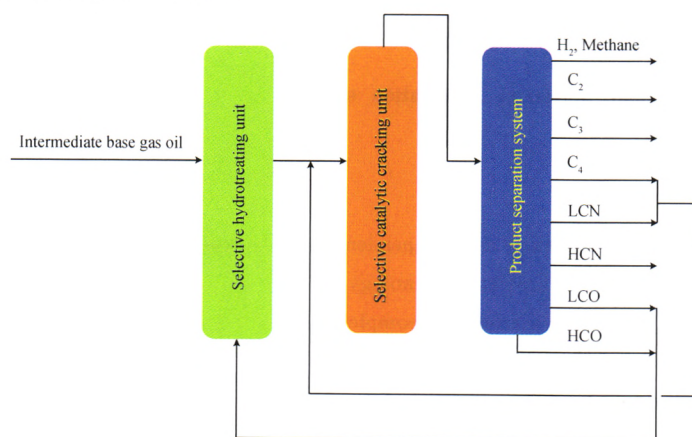
Special Reviews for 30th Anniversary of the Publication

Acta Petrolei Sinica (Petroleum Processing Section), 2015, 31(2): 208-217 doi: 10.3969/j.issn.1001-8719.2015.02.001

Petroleum Industry: Market Changes and Technical Strategy

LI Dadong

Remarkable changes of petrochemical market will take place under the new normal economy situation in China, a series of crucial technologies are being developed as countermeasures.

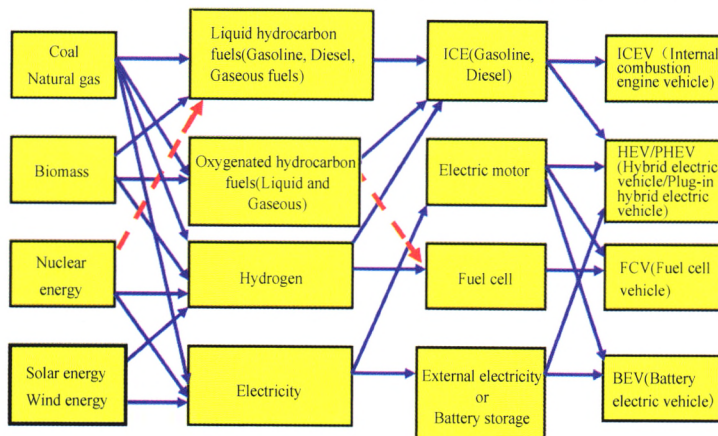


Acta Petrolei Sinica (Petroleum Processing Section), 2015, 31(2): 218-227 doi: 10.3969/j.issn.1001-8719.2015.02.002

Analysis of Petroleum Replacement Strategy

CHEN Junwu

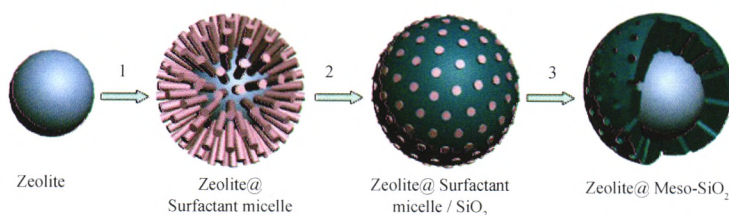
Various pathways of petroleum replacement were summarized in a network graph shown below. Four kinds of primary energies can be converted to four kinds of replacement fuels/energies, which served the engines, motors or batteries for four kinds of vehicles.



Review on the Progress of Core-Shell Structured Zeolite Molecular Sieve Materials

XUE Zhaoteng TANG Xueting WANG Wenxing ZHAO Dongyuan

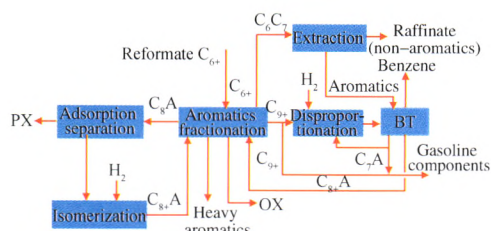
The synthesis and applications of unique core-shell structured zeolite composite materials were systematically reviewed. These core-shell structured zeolite materials showed excellent performance in the coal chemical, petrochemical and fine chemical industries.



Innovation on Engineering Design and Industrial Application of Complete Set of Aromatic Technology

SUN Lili

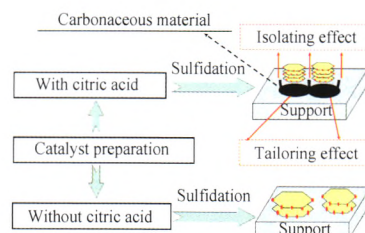
SINOPEC has successfully developed and owned the independent intellectual property rights of complete set of aromatic technology, which had been commercialized on the 600 kt/a aromatics complex in Hainan refinery in 2013. This aromatic technology was more competitive with lower energy consumption and production cost.



Application of Chelating Agents in Preparation of Hydrotreating Catalysts

NIE Hong LI Huifeng LONG Xiangyun LI Dadong

During sulfidation citric acid could be partly changed into carbonaceous material, which might play roles in tailoring support surface to promote the sulfidation of metal species, isolating WS₂ (MoS₂) slabs to avoid their aggregation and facilitating the formation of highly active Ni (Co)-W (Mo)-S_{II} phases of shorter slab length.



“973” Plans Promoting the Sustainable Development of China Petrochemical Industry

ZONG Baoning

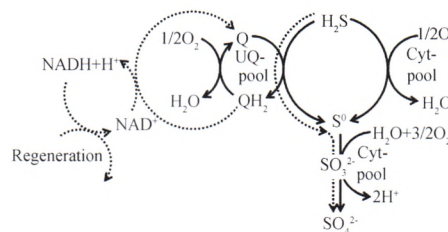
Since 1998, Research Institute of Petroleum Processing (RIPP) has been charged with three the National Basic Research Programs (“973” plans). These projects promote the development of science and technology, and demonstrate the leading role of RIPP in China petrochemical industry.



Advances in Researches of Gas Bio-Desulfurization and Sulfur Recovery

SONG Ziyu WU Dan DONG Jian ZHANG Jian LI Qingfang
XING Jianmin LIU Huizhou

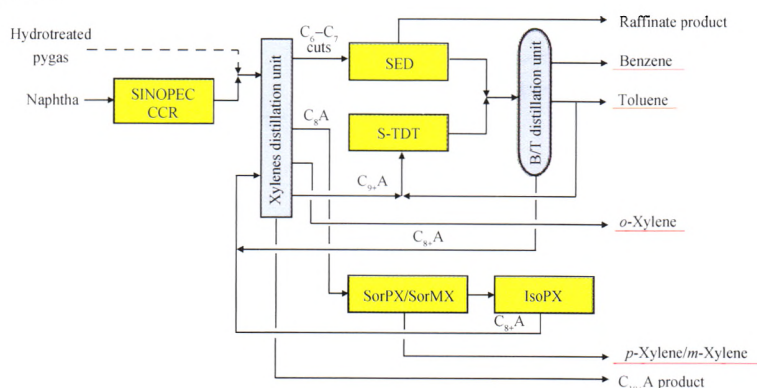
Gas bio-desulfurization and sulfur recovery technique was a method of wet desulfurization. It has many advantages, such as biocatalyst reactivation and sulfur unblock. In this article, the research progress in the mechanism and its advantages and characteristics of gas bio-desulfurization and sulfur recovery were emphatically introduced, analyzed and summarized.



Advances and Development of Aromatics Production Technologies for an Aromatics Complex

WU Wei

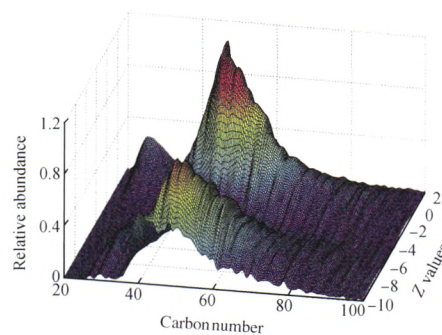
SINOPEC has successfully developed and commercialized its proprietary aromatics production technology package for an aromatics complex, including SINOPEC continuous catalytic reforming (CCR), sulfolane extractive distillation (SED), toluene disproportionation and transalkylation (S-TDT), adsorptive separation for PX or MX recovery (SorPX/SorMX) and xylene isomerization (IsoPX) processes.



Development and Application of Analytical Techniques on Heavy Oil at the Molecular Level

TIAN Songbai LONG Jun LIU Zelong

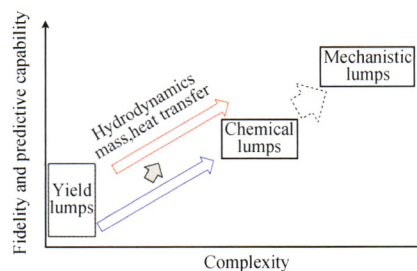
The Research Institute of Petroleum Processing (RIPP) has developed a variety of analytical methods to study heavy oil at the molecular level, in which the advanced mass spectrometers were used, including FT-ICR MS, GC×GC/TOF MS, GC/MS/MS, GC/TOF MS, along with the use of solid phase extraction, chemical derivatization, chemometrics and other instrumental analysis techniques. These methods are application-oriented, well targeted, and highly repeatable, and can provide abundance information on either the boiling point distribution or the carbon number distribution of various organic compounds, by which the qualitative and quantitative determination of some of the molecules in heavy oils are also able to be achieved.



Research Progresses of Lump Kinetic Model of FCC and Catalytic Pyrolysis

XIONG Kai LU Chunxi

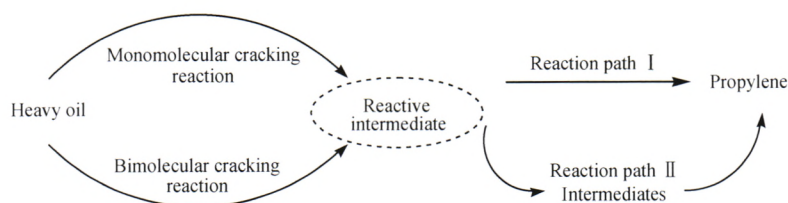
The research progresses of lump kinetic modeling of fluid catalytic cracking (FCC) and catalytic pyrolysis were reviewed. Factors of catalyst deactivation and hydrodynamics were also discussed. Based on the analysis, several suggestions for further development of FCC and catalytic pyrolysis lump kinetic modeling were proposed.



Molecular Reaction Chemistry of Heavy Oil Catalytic Cracking to Propylene

XIE Chaogang WEI Xiaoli LONG Jun

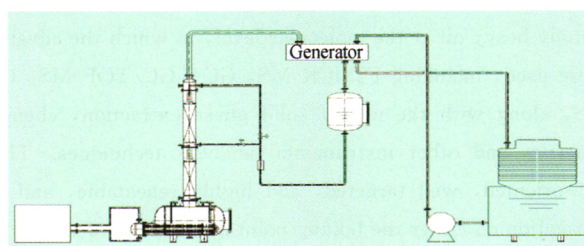
Reaction chemistry of catalytic cracking of heavy oil to propylene was investigated from molecular level. Propylene was produced by primary cracking of heavy oil and secondary cracking of cracking naphtha fraction. The structure and size of hydrocarbons were the key factors to affect the yield of propylene as well as the amounts of hydrogen and saturates in the feeds.



Development and Prospect of Distillation Technology in Petroleum Refining Industry

CONG Haifeng LI Hong GAO Xin LI Xingang

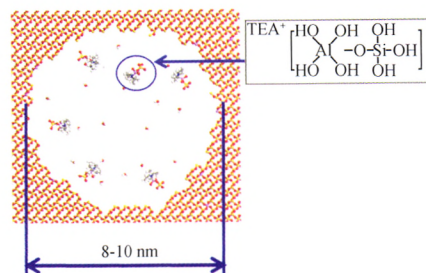
Applying new material in mass-transfer elements and coupling the low temperature cogeneration technology with the distillation process provide new approaches for the energy conservation and reinforcement of distillation process.



Synthesis of Beta Zeolite in the Absence of Alkali Cations

WANG Yongrui JIA Xiaomei YU Shaobing ZHANG Fengmei
MU Xuhong SHU Xingtian

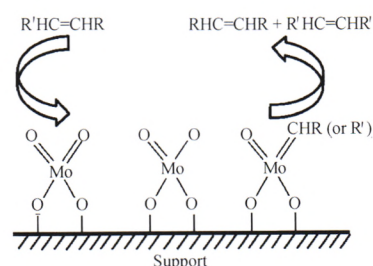
Beta zeolite can be synthesized without alkali cations in the hydrothermal system of silica-alumina gel (SAG), TEOAH and water. In the system, OH^- reacts with SAG to form silica-alumina species, and then these species assemble around the TEA^+ to form nuclei in the pores or out of the pores, leading to the crystallization of Beta zeolite.



Olefin Metathesis Over Mo Based Heterogeneous Catalysts

LI Xiujie ZHANG Dazhou XIN Wenjie ZHU Xiangxue
CHEN Fucun XIE Sujuan LIU Shenglin XU Longya

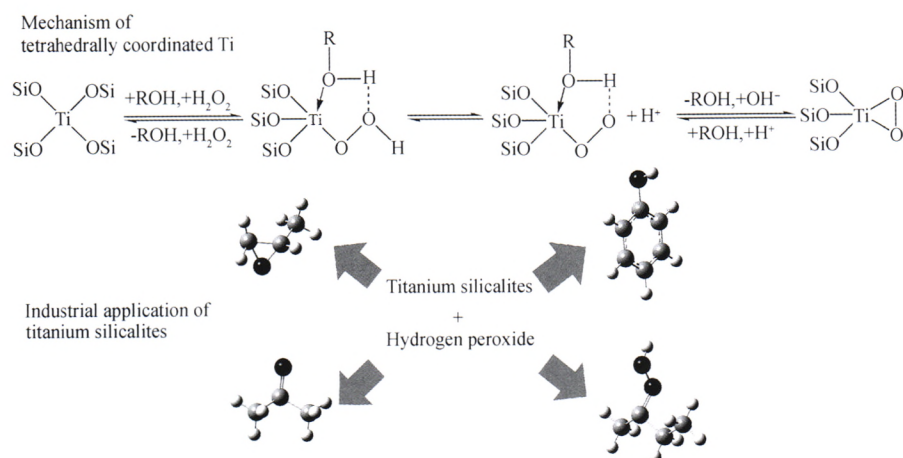
Olefin metathesis over Mo based heterogeneous catalysts is summarized and reviewed in detail, including catalyst preparation, reaction type and dynamic mechanisms.



Recent Advances in Synthesis and Catalytic Oxidation Reactions of Titanium Silicates

ZUO Yi LIU Min GUO Xinwen

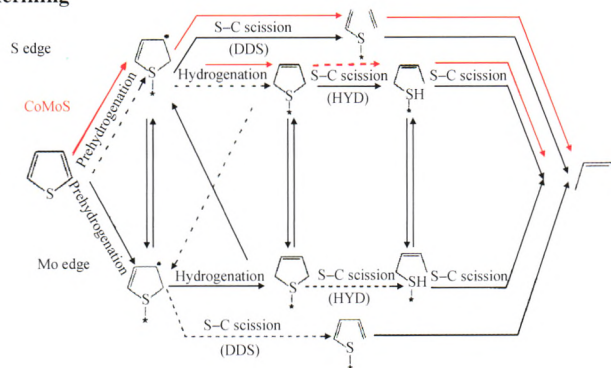
The recent advances in the synthesis and catalytic oxidation reactions of titanium silicates are reviewed. The oxidation system formed by titanium silicalites and H_2O_2 has a good application potential in the low temperature selective oxidation reactions.



Applications of Molecular Simulation Technology in the Field of Oil Refining

ZHOU Han REN Qiang LONG Jun

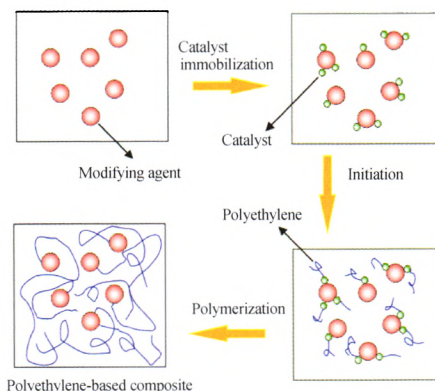
A brief review on the applications of molecular simulation technology in the field of oil refining, such as chemical reaction rules for all kinds of chemical refining process, the structure of residue, molecular design of oil additives and development of refining catalysis in recent years was carried out. Molecular simulation as an effectual implement which can investigate details of refining process has played an important role in the fields of refining industry.



A Review for Preparation of High Performance Polyethylene-Based Composites by In-situ Polymerization

HE Fuan ZHANG Liming

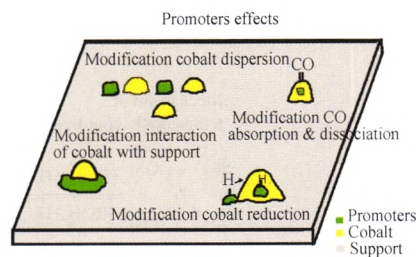
The commonly used process to prepare polyethylene-based composite by in-situ polymerization involves three steps: (1) the immobilization of catalyst on modifying agent, (2) the initiation of ethylene polymerization by cocatalyst, (3) the generation of polyethylene-based composite by ethylene polymerization.



Promoters and Their Effects on Cobalt Fisher-Tropsch Catalyst

SHI Yulin LIN Quan LI Jiabo

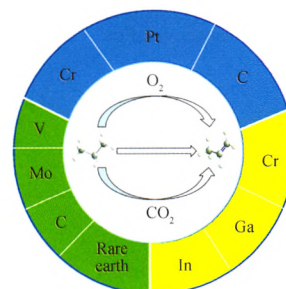
Promoters and their effects in Co catalyst for Fisher-Tropsch (F-T) reaction were summarized based on their positions in the periodic table of elements. These promoters include the VIII group elements of Ru, Rh, Pd, Ir, Pt, the VII B group elements of Mn, Re; the IV B group elements of Ti, Zr, the III B group elements of Gd, Ce, La, the IA group elements of Na, Li, K and the I A group elements of Ca, Mg.



Advance in Catalysts for Propane Dehydrogenation to Propylene

ZHANG Lingfeng LIU Yalu HU Zhongpan YANG Yuwang YU Haibin YUAN Zhongyong

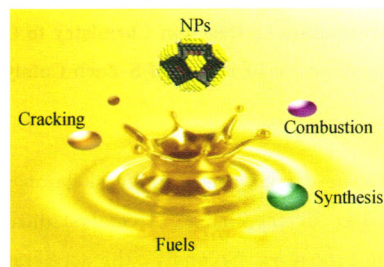
A critical review is presented on the catalyst systems for dehydrogenation of propane to propylene, including the direct dehydrogenation and oxidative dehydrogenation in the presence of O₂ or CO₂.



Application of Nanocatalyst in the Fields of Hydrocarbon Fuel and Biodiesel

ZHANG Chuanfeng ZHAO Jing FANG Wenjun GUO Yongsheng

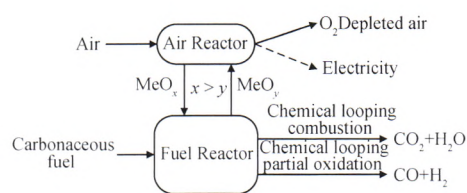
Nano-materials have been widely used in fuels. An overview about their status in fuels is provided, including catalytic cracking of hydrocarbon fuels, catalytic combustion of hydrocarbon fuels and biodiesels, synthesis of new fuels. The key research challenges of nano-catalysts are also analyzed.



Status and Perspective of Solid-Fueled Chemical Looping Technology

LUO Siwei LI Jun ZHANG Ran WANG Fangjie
CUI Longpeng

Chemical looping is a novel carbonaceous fuel conversion technology. Gas-fueled chemical looping technology has made significant progress in recent years. However, solid-fueled chemical looping technology is still to be improved. According to the oxidation state of the product, chemical looping technology could be used for power generation or syngas production.



Present Situation and Progresses of Residue Processing Technology

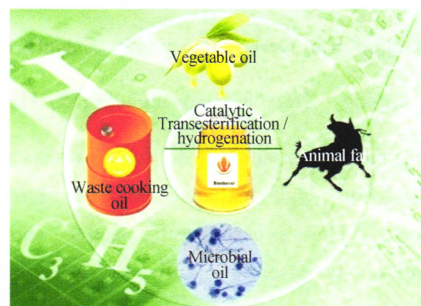
ZHONG Yingzhu JIN Aimin

Delayed coking will still be a main residue processing technology in the future, and the ebullated bed and slurry bed hydrocracking technologies will play an increasingly important role, but some technical problems need to be further improved, such as feedstock adaptability, conversion level, catalyst life and consumption. The combined processing schemes should be taken into account, because the advantages of different processes could be performed sufficiently.

Progresses in Catalytic Synthesis of Biodiesel

YING Hao HE Guijin ZHANG Lifeng LEI Qunfang
GUO Yongsheng FANG Wenjun

The main components of biodiesel are the fatty acid monoalkyl esters obtained from the transesterification of plant oils or animal fats with alcohols. The latest research advances in biodiesel production with catalytic synthesis technology are reviewed, including acid-base catalysis, enzyme catalysis, supercritical method, catalytic hydrogenation and microbial oil.



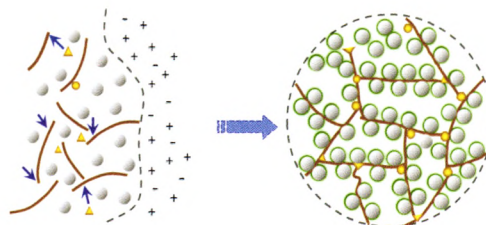
Acta Petrolei Sinica (Petroleum Processing Section), 2015, 31(2): 453-459 doi: 10.3969/j.issn.1001-8719.2015.02.024

From the Mechanism of Reaction Chemistry to Commercial Application

II. The Design and Performance of S Zorb Catalyst

LIN Wei LONG Jun

First of all, the carrier needs stable skeleton structure to avoid catalyst crushing caused by the change of catalyst during the sulfur removal and regeneration processes. Secondly, the accelerant nickel should be evenly distributed in S Zorb catalyst, which is beneficial to realize desulfurization and reducing octane loss simultaneously. Based on these, the special catalyst of S Zorb named FCAS was developed successfully.

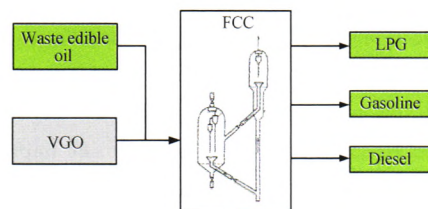


Acta Petrolei Sinica (Petroleum Processing Section), 2015, 31(2): 460-467 doi: 10.3969/j.issn.1001-8719.2015.02.025

Development and Industrial Test of Co-Processing Technology for Catalytic Cracking of Waste Edible Oil and VGO

SHAN Honghong LIU Yibin CHEN Xiaobo YANG Chaohe

Fatty acid ester is easy to crack over zeolite, and USY zeolite is beneficial to the high liquid yield. FCCU can be used to crack the mixture of VGO and waste edible oil (WEO) to LPG, gasoline and diesel, and the product quality has no obvious change.

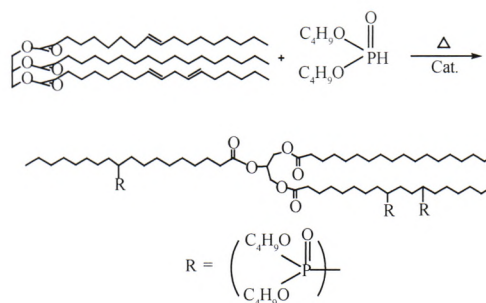


Acta Petrolei Sinica (Petroleum Processing Section), 2015, 31(2): 468-475 doi: 10.3969/j.issn.1001-8719.2015.02.026

Preparation and Tribological of Vegetable Oil Based Lubricating Oil Additive

LI Weimin JIANG Cheng WANG Xiaobo LIU Weimin

The environmentally friendly lubricant additive with the base of vegetable oil was synthesized by rapeseed oil and di-*n*-butyl phosphate via radical addition reaction. The synthesized additive showed excellent friction-reducing, anti-wear and extreme pressure properties in synthetic ester base fluids.

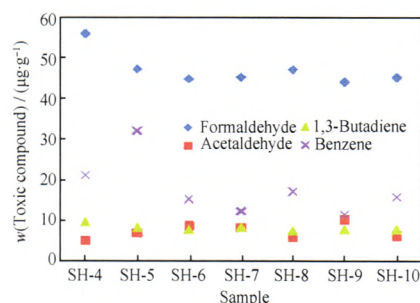


Acta Petrolei Sinica (Petroleum Processing Section), 2015, 31(2): 476-481 doi: 10.3969/j.issn.1001-8719.2015.02.027

Effects of Aromatics in Gasoline on Engine Exhaust Emissions

ZHANG Xiaoming ZHANG Jianrong SONG Haiqing

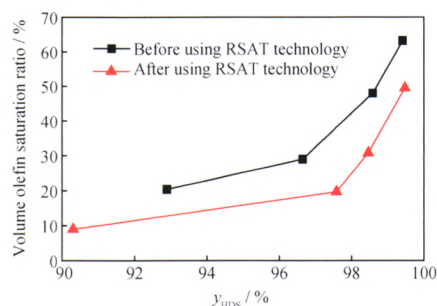
Effects of aromatics content and aromatics species in gasoline on regular and non-regular exhaust emissions were tested on engine bench. The experimental results showed that aromatics species in gasoline significantly affected benzene, toluene and other non-regular emissions in exhaust.



Development and Application of RSDS-III Technology for National V Gasoline Production

GAO Xiaodong ZHANG Dengqian LI Mingfeng
PAN Guangcheng NIE Hong LI Dadong

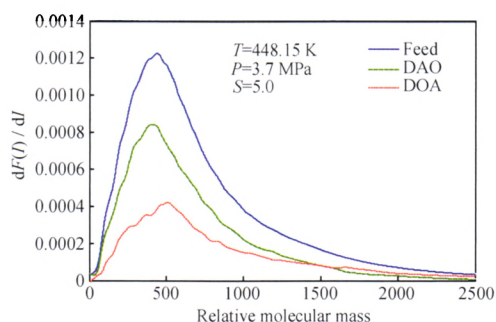
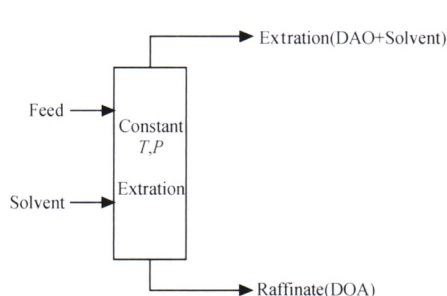
HCN HDS catalyst selective adjusting (RSAT) technology is one key point of the RSDS-III technology, compared with RSDS-II technology, which can significantly improve the selectivity of the catalyst for HDS of HCN.



Pentane Solvent Deasphalting of Tahe Atmospheric Residue Based on Continuous Thermodynamics Analysis

SHEN Benxian NING Aimin TONG Yujun LIU Jichang

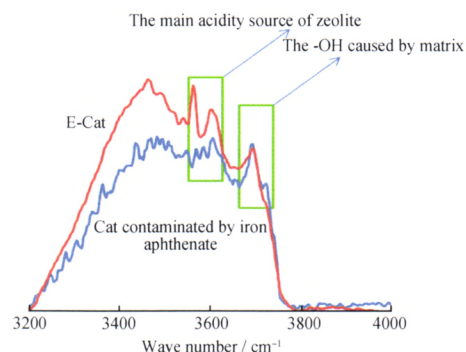
Atmospheric flashing distillation-solvent deasphalting combined process can be used to process Tahe crude oil. Based on continuous thermodynamics analysis, relative molecular mass distribution model for solvent deasphalting was established to investigate the effects of temperature and solvent ratio on the yield of DAO and DOA.



Effect of Iron Poison on the Catalyst in Heavy Oil Catalytic Producing Ethylene Process

XU Yun TIAN Huiping SHAO Xinjun

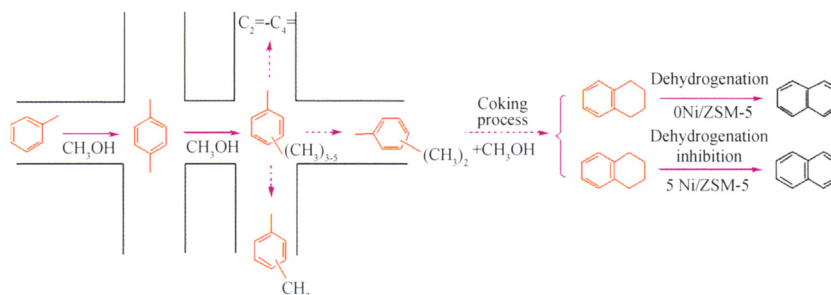
Infrared spectrum analysis results showed that the acids in zeolite massively lost after iron naphthenate pollution, indicating that in heavy oil catalytic producing ethylene process, organic iron poison was mainly located in the inner part of zeolite, rather than the outer surface of zeolite or microcrystalline entrance.



Effect of NiO Modification on Stability of Nano-Sized ZSM-5 Catalyst for the Para-Selective Methylation of Toluene With Methanol

TAN Wei HOU Keke LIU Min LI Wenhui LIU Haiou SONG Chunshan GUO Xinwen

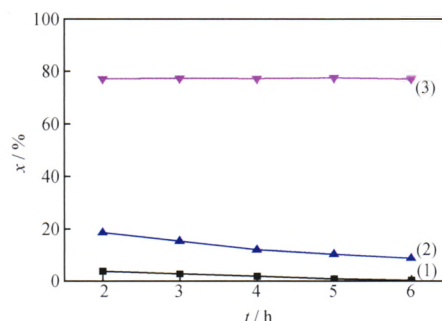
The modification of ZSM-5 by NiO with the content at 3 % and 5 % mass fraction significantly inhibits the coking process due to suppression of dehydrogenation and condensation, leading to the improved catalyst stability.



Research on the Hydrodeoxygenation of *o*-Cresol Over Reduced Catalysts

SANG Xiaoyi LI Huifeng LI Dadong LI Mingfeng

The hydrodeoxygenation performances of reduced Mo/Al₂O₃, CoMo/Al₂O₃ and CoMoEDTA/Al₂O₃ catalysts were studied. The results showed that the catalytic activity of these catalysts decreased in the order of CoMoEDTA/Al₂O₃, CoMo/Al₂O₃, Mo/Al₂O₃. In addition, higher stability and hydrodeoxygenation selectivity were obtained over CoMoEDTA/Al₂O₃ catalyst at the same evaluation conditions.

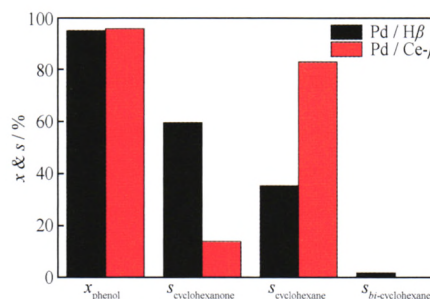


(1) Mo/Al₂O₃; (2) CoMo/Al₂O₃; (3) CoMoEDTA/Al₂O₃

Catalytic Performances of Pd/H β and Pd/Ce- β in Aqueous-Phase Hydrodeoxygenation of Phenol

YU Zhiquan WANG Fujun XU Xiaoyu WANG Yao
LI Xiang WANG Anjie

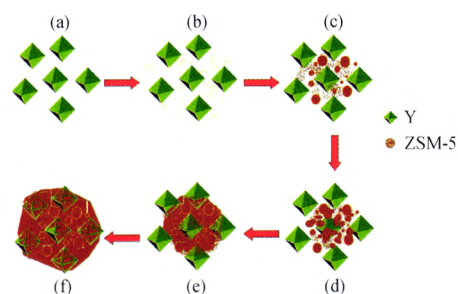
Both Pd/H β and Pd/Ce- β showed high performance in aqueous phase HDO of phenol. Ion-exchange of H β with Ce³⁺ led to enhanced hydrogenation activity and suppressed alkylation activity of the supported Pd catalysts. It appeared that the medium acid sites might be the catalytic sites for the alkylation of cyclohexanone with cyclohexanol.



Synthesis of Core-Shell Zeolite Composite ZSM-5/Y Based on Depolymerization of Y Zeolite

PAN Meng LIU Yujian ZHENG Jiajun LI Biao
ZHANG Hongyan YI Yuming TIAN Huiping LI Ruifeng

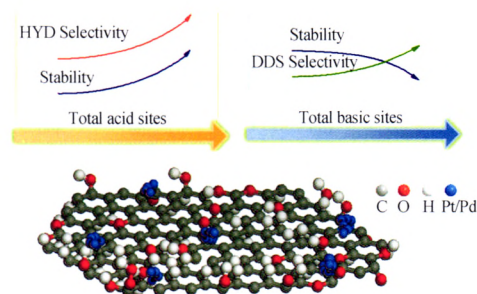
The extracted aluminum species by depolymerizing NaY zeolite crystals in the conditions of alkaline solution react with the silicon species near the interface of the NaY zeolite induces and promotes the growth of ZSM-5 crystals. ZSM-5/Y zeolite composite can be obtained by controlling hydrothermal treatment time.



Preparation of Pd and Pt Hydrodesulfurization Catalysts Supported on Activated Carbons

DONG Chao LI Xiang WANG Anjie CHEN Yongying

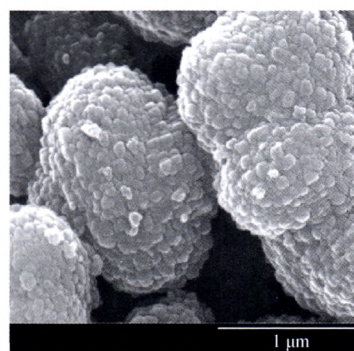
The hydrogenation pathway (HYD) selectivity and the stability of Pt/C and Pd/C increased with increasing the surface acidic groups of activated carbon, whereas the basic groups of the support showed a positive effect on the C-S bond cleavage activity of the catalysts, but a negative influence on their stability.



Design and Synthesis of Hierarchical ZSM-5 Zeolite and Its Catalytic Performance of MTP Reaction

LI Wenlong MA Tong YIN Qi GU Hongge WU Zhijie
DOU Tao

Nanocrystal aggregates hierarchical ZSM-5 zeolite was synthesized without other organic additives and secondary template than TPAOH template. The hierarchical ZSM-5 zeolite showed excellent catalytic performance in MTP reaction. The product with optimized diffusion limitation could be easily separated.

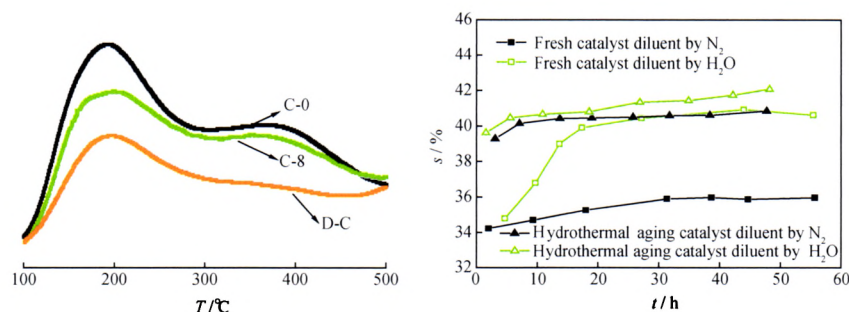


SEM image of hierarchical ZSM-5 zeolite

Influence of Dilution Gas on Product Distribution of Methanol to Propylene Reaction

JIANG Binbo YAN Lixia WEI Lingze FENG Xiang LIAO Zuwei HUANG Zhengliang WANG Jingdai
YANG Yongrong WANG Xieqing

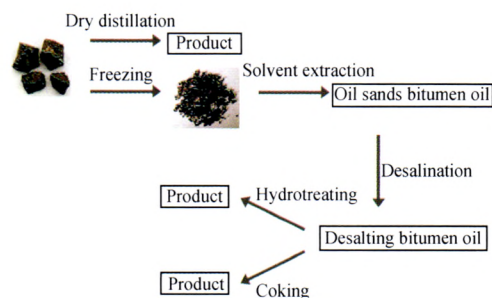
The product distribution of the methanol to propylene (MTP) reaction under different dilution ratios of H₂O or N₂ was investigated, in order to study their different diluent effects on MTP over ZSM-5 zeolite. The results showed that the adsorption effect of H₂O on the acidity would firstly cause the removal of weak acid sites of catalyst, which mainly happened during the initial period of MTP reaction. By hydrothermal aging of catalyst for 24 h, the relatively stable framework aluminum was retained, thus the chemical adsorption effect of H₂O on the acid sites decreased, resulting in less difference in the selectivity of propylene between diluent gas N₂ and H₂O.



Processing and Utilization of Bitumen Oil From Oil Sands

WANG Yalan ZHANG Huicheng GUAN Minghua
XU Zhiyang HE Bing DU Yanmin

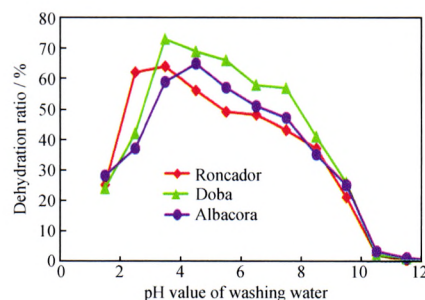
Ebullated bed hydrogenation experiment, coking test and dry distillation test for oil sands were carried out. The results showed that ebullated bed hydrogenation was the most effective method of bitumen oil conversion with the effective recovery and utilization of oil sand bitumen.



The Reason of Emulsification of High TAN Crude Oils and New Methods for Breaking the Emulsions

LI Bengao WANG Hao TAN Li

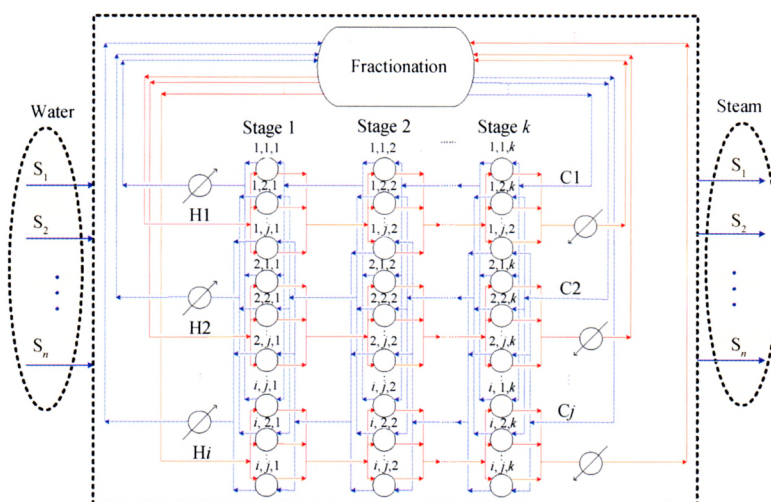
High TAN crude oils contained naphthenic acids and naphthenates. Naphthenates were alkaline and with higher interfacial activity. The acidic washing water neutralized naphthenates and converted it to naphthenic acids with lower interfacial activity. So the dehydration ratio of high TAN crude oils was enhanced when the pH value of washing water was in the range of 4-6.



Integrated Optimization of the Fractionation and Heat Exchange Processes in Delayed Coker With Considering Steam Generation

LEI Yang CHEN Xiaozhong ZHANG Bingjian CHEN Qinglin

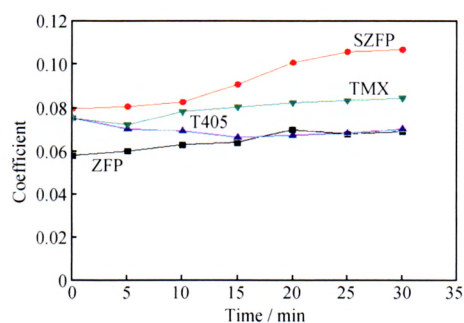
In the energy optimization of delayed coker, fractionation, heat exchange and utility are the key points. An integrated optimization model was established, taking heat removals from the complex fractionator as coupling variables. Meanwhile, the steam levels and flow rates were optimized theoretically to improve the whole energy efficiency and economic benefit.



Study on Anti-Wear Additive and Hot Rolling Oil From Bio-Material

DUAN Qinghua LAN Xiaoyan HUANG Zuoxin
CHEN Zheng

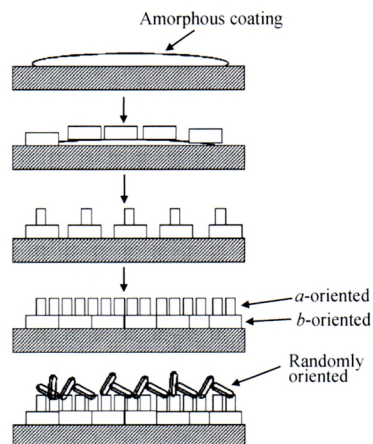
Zinc dithiophosphate with special molecular structure was synthesized from vegetable oil. The dithiophosphate with oleic acid structure has better properties of anti-oxidation, anti-wear and reducing friction. Bio-base oil was synthesized from bio-diesel. Hot rolling oil from the bio-base oil was studied, showing that the studied hot rolling oil had better properties than reference oil.



Preparation of *a*-Oriented ZSM-5 Coatings on the Stainless Steel Substrate and Its Mechanism of Formation

LI Gang KUANG Ye HU Shenlin

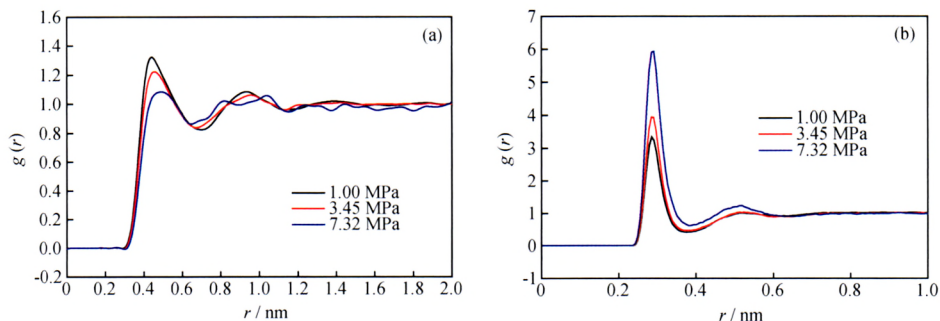
a-Oriented ZSM-5 crystals were formed on the upward side of the substrate rested on the autoclave at an angle, whereas randomly oriented crystals were formed on the substrate horizontally placed at the bottom of the autoclave. The possible formation mechanism for these crystals was discussed and illustrated.



Dispersion of Supercritical CO₂ in Organic Liquid

YANG Zihao LIN Meiqin DONG Zhaoxia LI Mingyuan

The research on the subject in recent years demonstrated that near-supercritical and supercritical CO₂ was not only dissolved in organic liquid, but formed CO₂-CO₂ molecule aggregate, organic liquid-organic liquid molecule aggregate and CO₂-organic liquid molecule aggregate in CO₂ + organic liquid system.



(a) Hexane-hexane in CO₂ + hexane; (b) Ethanol-ethanol in CO₂ + ethanol

石油学报(石油加工)
SHIYOU XUEBAO (SHIYOU JIAGONG)

主 编 汪燮卿

双 月 刊

(1985年3月创刊)

第 31 卷 第 2 期 2015 年 4 月 25 日

ACTA PETROLEI SINICA
(PETROLEUM PROCESSING SECTION)

Editor in Chief Wang Xieqing

Bimonthly

(Started in March 1985)

Vol. 31 No. 2 Apr. 25, 2015

主 管: 中国科学技术协会
主 办: 中国石油学会
编辑、出版: 《石油学报(石油加工)》编辑部
地址: 北京市学院路 18 号
邮编: 100083
电话: 010-62310752, 010-82368282
传真: 010-82368697
网址: www.syxbsyjg.com
E-mail: syxb8282.ripp@sinopec.com,
syxb8282@163.com

执行主编: 李才英
副 主 编: 冯薇荪 胡晓春
印 刷: 北京科信印刷有限公司
发 行:
国 内: 北京市报刊发行局
国 外: 中国国际图书贸易总公司
(中国国际书店)
北京市 399 信箱

国内订阅处: 全国各地邮局
报刊登记证: (BJ)第 1404 号

Responsible Institution: China Association for Science and Technology
Sponsored by: China Petroleum Society
Edited and Published by: Editorial Office of Acta Petrolei Sinica
(Petroleum Processing Section)
Add: No. 18 Xueyuan Road, Beijing 100083, China
Tel: +86-010-62310752, +86-010-82368282
Fax: +86-010-82368697
Http://www.syxbsyjg.com
E-mail: syxb8282.ripp@sinopec.com,
syxb8282@163.com

Executive Chief Editor: Li Caiying
Deputy Editor in Chief: Feng Weisun Hu Xiaochun
Printed by: Beijing Kexin Printing Co., Ltd.
Distributed by:
Domestic: The Bureau of Periodical Distribution, Post
Office of Beijing
Abroad: China International Book Trading Corporation
(Guoji Shudian), P. O. Box 399, Beijing
(Code No. BM845)

Subscribed by: Local Post Offices in China
Periodical Registration: (BJ) No. 1404

ISSN 1001-8719
CN 11-2129/TE

国内邮发代号: 82-332
国外发行代号: BM845

定价: 20.00 元/期
120.00 元/年