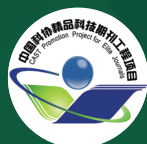


化工进展

Chemical Industry and Engineering Progress

Vol.41 No.2

2022年2月



中国化工学会会刊 ISSN 1000-6613 CN 11-1954/TQ CODEN HUJIEK

化工进展

第四十一卷

第二期

二〇二二年二月

ATV 安特威
助您安心享受美好生活

全金属三偏心蝶阀
双向密封、零泄漏

- 双向VI级密封, 100000次以上开关寿命
- 密封环可以互相更换
- 全数字化生产, 远程可视、实时可控
- 大幅延长使用寿命, 降低维修成本

助您安心享受美好生活

智能蝶阀柔性产线

扫码获取更多产品案例

选片式三偏心蝶阀 高温蝶阀 深冷蝶阀

广告

ISSN 1000-6613



9 771000 661225



主办 | 中国化工学会
 化学工业出版社有限公司



目次

特约评述

高压氢环境奥氏体不锈钢焊件氢脆研究进展周池楼, 何默涵, 郭晋, 李运泉, 吴昊, 肖舒, 陈国华, 欧阳瑞祥, 何实(519)

化工过程与装备

聚丙烯非织造布熔喷过程的计算流体力学模拟研究进展陈龙, 李霞霞, 李伟祥, 戚锐, 邓鑫, 吴斌鑫(537)
均温板散热技术研究进展万晓琪, 崔晓钰, 谢荣建(554)
基于因果-模糊层次分析的湿法脱硫系统运行稳定性综合评价侯建勇, 严芳, 王浩, 程晓辉, 严厚华, 胡刚(569)
螺旋液桥降膜规整填料螺线间隙液桥形成与流动韩红明, 从海峰, 李洪, 高鑫, 李鑫钢(584)
具有输入数据注意力机制的卷积神经网络用于氟化工产品质量预测李欣铜, 陈志冰, 魏志强, 李苏桐, 陈旭, 宋凯(593)
新型多降液管塔板的流体力学性能及其流场CFD模拟尹洪贺, 沈绍传, 齐亮, 姚克俭(601)
电场作用下基面液滴蒸发与内部流动数值模拟张天昊, 许浩洁, 吴天一, 李步发, 王军锋(609)

能源加工与技术

离子液体萃取分离烃类化合物的研究进展倪清, 来锦波, 彭东岳, 管翠诗, 龙军(619)
沥青岩中界面活性沥青质分子结构及其在矿物表面吸附特征章雪莹, 马俊, 何林, 隋红, 李鑫钢(628)
微波与碳基催化剂协同促进果糖制5-羟甲基糠醛吕孝琦, 李洪, 赵振宇, 李鑫钢, 高鑫, 范晓雷(637)
Mg修饰Fe/Al载氧体煤化学链制氢安阳, 袁思杰, 高振东, 吴曼, 王凌云, 郭庆杰(648)
生物柴油雾化特性仿真模拟及实验研究马鑫, 王霜, 李法社, 张逸水, 蒋上(655)

工业催化

单原子位点催化剂及其电催化应用研究进展竹涛, 韩一伟, 刘帅, 谢蔚, 苑博, 宋慧平, 程芳琴(666)
水热催化制备绿色柴油工艺中催化剂的失活与再生张静, 马慧玲, 曾得福, 姚潇毅(682)
改性氧化钛光催化氧化单质汞性能及其影响因素研究进展高天, 张伊黎, 熊卓, 赵永椿, 张军营(690)
甲醛和丙醛 Mannich 缩合制备甲基丙烯醛杨世龙, 陈臣举, 张春雷(701)
金属材料协同 VB_{12} 催化卤代有机物降解研究进展巫秀玲, 赵晓祥, 孙铸宇(708)
钙钛矿型光催化剂的制备及脱除典型气态污染物的研究进展马颖菲, 苑鹏, 沈伯雄(721)
固相钴基催化剂活化过一硫酸盐在水处理中的研究进展许泽涛, 曹怡婷, 王俏, 王志红(730)
 Pd_3S_4 材料的制备及其在催化领域的研究进展朱飞飞, 马磊, 龙慧敏(740)
沸石孔结构对植物油催化裂化性能的影响郑庆庆(750)
EDTA 辅助制备高活性费托合成催化剂赵潇, 陈中顺, 唐忠强, 石轩, 代成义, 马晓迅(759)
自蔓延燃烧法制备锰氧化物催化剂及其催化燃烧炭烟颗粒彭超, 于迪, 王瀚懿, 张春雷, 于学华, 赵震(770)

材料科学与技术

- 塑料衍生碳材料用于超级电容器的研究现状·····郭冠伦,刘锐,余洋洋,汪云(781)
- 碳化物衍生碳的制备及其应用研究进展·····唐金琼,孔勇,沈晓冬(791)
- 层状双金属氢氧化物的构筑及其处理水体中抗生素的研究进展·····王勇,姜明昊,王怡霖,徐婧婷,支硕(803)
- 聚酰亚胺气凝胶制备、性能及应用进展·····宋梓豪,王宏鑫,杜博宇,段秋阳,卢晶虹,江颖辉,崔升(816)
- 十二水磷酸氢二钠相变储能材料研究进展·····曾最,罗凯,叶伟梁,费华,王艳,刘景滔(827)
- 二氧化硅气凝胶常压干燥工艺的研究进展·····武晨浩,李昆锋,李肖华,费志方,张震,杨自春(837)
- 硅藻土基表面有机化氢氧化镁的制备及性能·····申红艳,刘有智,朱海林,赵凌波(848)
- 巯基化Zr-MOFs/聚酯无纺布复合材料制备及应用·····陈运涛,董晓旭,王洋,王健男,崔美,黄仁亮(854)
- 多层纳米结构蓝色TiO₂的电化学氧化性能和稳定性·····戴绍铃,于桢,李逸航,成少安(862)
- 偶联剂改性氧化铈提高硅凝胶的耐热氧性能·····马星星,冯亚凯(874)
- Fe₃O₄@PGMA-Arg磁性吸附剂的制备及对亚铁离子的吸附性能·····田忠宇,杨敬一,王悦兴,徐心茹(881)
- 膨胀石墨/石蜡复合相变材料的导电及发热特性·····周涛涛,熊志波,吴志根,李尚(892)
- TOCNF与磁性羧甲基壳聚糖纳米粒子复合物的制备及吸附Pb²⁺的特性·····周丽莎,李若男,卞雨洁,陈舜胜(901)
- 聚乙烯醇基高透湿高阻隔三元混合基质全热交换膜制备和性能·····裴现,杨文杰,李士洋,张秀敏,吴涛,薛立新(911)
- 温室用Na₂SO₄·10H₂O-Na₂HPO₄·12H₂O复合定形相变材料制备及性能·····张文杰,吴畏,李松泽,张子健,衣雪梅(920)

生物与医药化工

- PVA-g-mPEG接枝聚合物的制备及其防药物滥用性能·····杨璐,李效文,李凤和,姚日生(930)
- 代谢工程改造大肠杆菌生产琥珀酸·····唐文秀,王学明,郭亮,季立豪,高聪,陈修来,刘立明(938)

资源与环境化工

- 微生物燃料电池在废水处理中的研究进展·····陈诗雨,许志成,杨婧,徐浩,延卫(951)
- 燃煤电厂逃逸氨迁移转化特性研究进展·····郑成强,李小龙,李军状,段玖祥,杨林军(964)
- 高盐废水微生物脱盐池处理研究进展·····张群,陈重军,谢嘉玮,邹馨怡(974)
- nZVI/BC与(Cu-Pd)/BC协同提高硝酸盐的去除和氮气的选择性·····潘伟亮,吴齐叶,曹云鹏,张先炳,古励,何强(981)
- 硫代硫酸盐驱动自养反硝化耦合厌氧氨氧化强化总氮去除·····刘锋,张雪智,王苏琴,冯震,葛丹丹,杨洋(990)
- 市政污泥吸附等温线模型和热力学性质·····谷志攀,阳季春,张叶,陶乐仁,刘泛函(998)
- Mn²⁺催化臭氧氧化活性污泥强化溶胞·····韦婷婷,王先恺,詹咏,陈思思,董滨(1009)
- 复合菌群利用模拟APG协同FNA预处理剩余污泥水解液合成PHA·····王娜,宋秀兰,管博韬(1017)
- 复配醇胺溶液对CO₂的吸收解吸性能及其降解性能·····李红,吉轲,齐天勤机,李晓静,万慧慧,张永春,陈绍云(1025)
- 电化学-微滤耦合工艺对循环水钙硬度的结晶分离·····苏晴,唐沂珍,刘迪,江波(1036)
- 纳米片状Mn₂O₃@α-Fe₃O₄活化过碳酸盐降解偶氮染料·····徐铭骏,郭兆春,李立,朱紫琦,张倩,洪俊明(1043)
- 微波诱导活性炭激发等离子体射流脱硝实验·····杨广东,苏林,邹志雪,姜涛(1054)
- 电解锰渣浆液烟气脱硫性能及机制·····聂紫萌,杨点,熊玉路,李英杰,田森林,宁平(1063)

观点

- 中国钢铁工业低碳绿色生产氢源思考与探索·····周颖,周红军,徐春明(1073)
- 碳中和约束下绿色减排体系的构建·····田原宇,乔英云,张永宁(1078)

责任编辑:郑宇印

英文顾问:郭梅芳,金仁村,李保庆,龙秉文,王运东



Contents

Invited review

- Review on hydrogen embrittlement of austenitic stainless steel weldments in high pressure hydrogen atmosphere**
···ZHOU Chilou, HE Mohan, GUO Jin, LI Yunquan, WU Hao, XIAO Shu, CHEN Guohua, OUYANG Ruixiang, HE Shi (519)

Chemical processes and equipment

- Research progress in computational fluid dynamics simulation of melt-blown fabric production**
·····CHEN Long, LI Xiaxia, LI Weixiang, QI Ri, DENG Xin, WU Binxin (537)
- Research progress of vapor chamber heat dissipation technology** ······WAN Xiaoli, CUI Xiaoyu, XIE Rongjian (554)
- Comprehensive evaluation of operation stability of wet desulfurization system based on causal-fuzzy AHP**
·····HOU Jianyong, YAN Fang, WANG Hao, CHENG Xiaohui, YAN Houhua, HU Gang (569)
- Formation and fluid flow of helical channels liquid-bridge in helical liquid-bridge flow structured packings**
·····HAN Hongming, CONG Haifeng, LI Hong, GAO Xin, LI Xingang^{1,2} (584)
- Convolution neural network with attention mechanism of input data for quality prediction of fluorine chemical products**
·····LI Xintong, CHEN Zhibing, WEI Zhiqiang, LI Sutong, CHEN Xu, SONG Kai (593)
- Hydrodynamic performances of a novel multiple downcomer tray and related CFD analysis**
·····YIN Honghe, SHEN Shaochuan, QI Liang, YAO Kejian (601)
- Numerical simulation of evaporation and internal flow of substrate droplet under electric field**
·····ZHANG Tianhao, XU Haojie, WU Tianyi, LI Bufa, WANG Junfeng (609)

Energy processes and technology

- Progress in extraction separation of hydrocarbons by ionic liquids**
·····NI Qing, LAI Jinbo, PENG Dongyue, GUAN Cuishi, LONG Jun (619)
- Molecular structure of interfacially active asphaltene in asphalt rock and its adsorption characteristics on mineral surface**
·····ZHANG Xueying, MA Jun, HE Lin, SUI Hong, LI Xingang (628)
- Microwave-assisted carbon-based catalysts for fructose dehydration to 5-hydroxymethylfurfural**
·····LYU Xiaoli, LI Hong, ZHAO Zhenyu, LI Xingang, GAO Xin, FAN Xiaolei (637)
- Chemical looping hydrogen generation of coal with oxygen carrier of Mg-modified Fe/Al**
·····AN Yang, YUAN Sijie, GAO Zhendong, WU Man, WANG Lingyun, GUO Qingjie (648)
- Simulation and experimental research on the atomization characteristics of waste oil biodiesel**
·····MA Xin, WANG Shuang, LI Fashe, ZHANG Yishui, JIANG Shang (655)

Industrial catalysis

- Progress in electrocatalysis by single-atom site catalysts**
·····ZHU Tao, HAN Yiwei, LIU Shuai, XIE Wei, YUAN Bo, SONG Huiping, CHENG Fangqin (666)
- Deactivation and regeneration of heterogeneous catalysts in green diesel production by hydrothermal process**
·····ZHANG Jing, MA Huiling, ZENG Defu, YAO Xiaoyi (682)
- Research progress of modified titanium oxide photocatalytic oxidation of elemental mercury and its influencing factors**
·····GAO Tian, ZHANG Yili, XIONG Zhuo, ZHAO Yongchun, ZHANG Junying (690)
- Synthesis of methacrolein (MAL) via Mannich condensation of formaldehyde and propionaldehyde**
·····YANG Shilong, CHEN Chenju, ZHANG Chunlei (701)
- Catalytic degradation of halogenated organic compounds by synergistic system of metal materials and VB₂: a review**
·····WU Xiuling, ZHAO Xiaoxiang, SUN Zhuoyu (708)
- Research progress of preparation and utilization of perovskite-type photocatalyst in removal of typical gaseous pollutants** ······MA Haofei, YUAN Peng, SHEN Boxiong (721)
- Research progress of peroxydisulfate activated by solid-phase cobalt-based catalyst in water treatment**
·····XU Zetao, CAO Yiting, WANG Qiao, WANG Zhihong (730)
- Research progresses on the preparation and application of Pd₂S₃ catalysts** ······ZHU Feifei, MA Lei, LONG Huimin (740)
- Influence of pore structure of USY zeolite on its performance in catalytic cracking of vegetable oil** ······ZHENG Qingqing (750)
- EDTA-assisted preparation of highly active catalysts for Fischer-Tropsch synthesis**
·····ZHAO Xiao, CHEN Zhongshun, TANG Zhongqiang, SHI Xuan, DAI Chengyi, MA Xiaoxun (759)
- Preparation of manganese oxide catalysts by self-propagating combustion method and their catalytic performance for soot combustion** ······PENG Chao, YU Di, WANG Lanyi, ZHANG Chunlei, YU Xuehua, ZHAO Zhen (770)

Materials science and technology

- Progress on carbon materials derived from waste plastic for supercapacitors**
·····GUO Guanlun, LIU Rui, YU Yangyang, WANG Yun (781)

- Advances in the synthesis and application of the carbide-derived carbons ...TANG Jinqiong, KONG Yong, SHEN Xiaodong (791)
- Advance in construction of layered double hydroxides and their treatment with antibiotics in water
.....WANG Yong, JIANG Minghao, WANG Yilin, XU Jingting, ZHI Shuo (803)
- Progress in preparation and performance application of polyimide aerogel
.....SONG Zihao, WANG Hongxin, DU Boyu, DUAN Qiuyang, LU Jinghong, JIANG Yinghui, CUI Sheng (816)
- Research progress of disodium hydrogen phosphate dodecahydrate phase change material
.....ZENG Zui, LUO Kai, YE Weiliang, FEI Hua, WANG Yan, LIU Jingtao (827)
- Research progress on preparation of silica aerogels at ambient pressure drying
.....WU Chenhao, LI Kunfeng, LI Xiaohua, FEI Zhifang, ZHANG Zhen, YANG Zichun (837)
- Preparation and property of diatomite supported hydrophobic magnesium hydroxide
.....SHEN Hongyan, LIU Youzhi, ZHU Hailin, ZHAO Lingbo (848)
- Preparation and application of mercapto-functionalized Zr-MOFs/polyester fabric composite
.....CHEN Yuntao, DONG Xiaoxu, WANG Yang, WANG Jiannan, CUI Mei, HUANG Renliang (854)
- Hierarchically nanostructured blue TiO_2 with enhanced electrochemical oxidation performance and stability
.....DAI Shaoling, YU Zhen, LI Yihang, CHENG Shao'an (862)
- Improvement of thermal oxygen aging resistance of silicon gel by adding modified cerium oxide with coupling agent
.....MA Xingxing, FENG Yakai (874)
- Preparation of Fe_3O_4 @PGMA-Arg magnetic adsorbents and its adsorption performance for ferrous ion
.....TIAN Zhongyu, YANG Jingyi, WANG Yixing, XU Xinru (881)
- Characters of electric resistance and heating of expanded graphite/paraffin composite phase change materials
.....ZHOU Taotao, XIONG Zhibo, WU Zhigen, LI Shang (892)
- Preparation of TOCNF and magnetic carboxymethyl chitosan nanoparticles composite and adsorption properties of Pb^{2+}
.....ZHOU Lisha, LI Ruonan, BIAN Yujie, CHEN Shunsheng (901)
- Polyvinyl alcohol (PVA) based ternary mixed matrix total heat exchange membranes (THEM) comprising montmorillonite (MMT) and CaCl_2 : preparation and characterization
.....CHANG Xian, YANG Wenjie, LI Shiyang, ZHANG Xiumin, WU Tao, XUE Lixin (911)
- Preparation and properties of $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$ - $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$ composite shaped phase change material for greenhouse
.....ZHANG Wenjie, WU Wei, LI Songze, ZHANG Zijian, YI Xuemei (920)

Biochemical and pharmaceutical engineering

- Preparation and anti-drug abuse performance of PVA-g-mPEG graft polymer...YANG Lu, LI Xiaowen, LI Fenghe, YAO Risheng (930)
- Metabolic engineering of *Escherichia coli* to produce succinic acid
.....TANG Wenxiu, WANG Xueming, GUO Liang, JI Lihao, GAO Cong, CHEN Xiulai, LIU Liming (938)

Resources and environmental engineering

- Research progress of microbial fuel cell in wastewater treatment ...CHEN Shiyu, XU Zhicheng, YANG Jing, XU Hao, YAN Wei (951)
- Research progress on migration and transformation characteristics of escaped ammonia in coal-fired power plants
.....ZHENG Chengqiang, LI Xiaolong, LI Junzhuang, DUAN Jiuxiang, YANG Linjun (964)
- Research progress on the microbial desalination cell for high-salt wastewater treatment
.....ZHANG Qun, CHEN Chongjun, XIE Jiawei, ZOU Xinyi (974)
- Improvement of nitrate removal and nitrogen selectivity by the synergy of nZVI/BC and (Cu-Pd)/BC
.....PAN Weiliang, WU Qiye, CAO Yunpeng, ZHANG Xianbing, GU Li, HE Qiang (981)
- Thiosulfate-driven denitrification coupled with ANAMMOX to enhance total nitrogen removal
.....LIU Feng, ZHANG Xuezhi, WANG Suqin, FENG Zhen, GE Dandan, YANG Yang (990)
- Mathematical modelling of water sorption isotherms and thermodynamic properties of municipal sewage sludge
.....GU Zhipan, YANG Jichun, ZHANG Ye, TAO Leren, LIU Fanhan (998)
- Enhancement of cell lysis in activated sludge by catalytic ozonation of Mn^{2+}
.....WEI Tingting, WANG Xiankai, ZHAN Yong, CHEN Sisi, DONG Bin (1009)
- Synthesis of PHA by mixed microorganisms using simulative hydrolysate liquid from the excess sludge by APG combined with FNA pretreatment ...WANG Na, SONG Xiulan, ZAN Botao (1017)
- Properties of CO_2 absorption-desorption based on alcohol amines solutions and their degradation
.....LI Hong, JI Ke, QI Tianqinji, LI Xiaojing, WAN Huihui, ZHANG Yongchun, CHEN Shaoyun (1025)
- Electrochemical-microfiltration coupling process for the crystal separation of calcium hardness in circulating cooling water
.....SU Qing, TANG Yizhen, LIU Di, JIANG Bo (1036)
- Degradation of azo dyes by sodium percarbonate activated with nanosheet Mn_2O_3 @ α - Fe_2O_3
.....XU Mingjun, GUO Zhaochun, LI Li, ZHU Ziqi, ZHANG Qian, HONG Junming (1043)
- Experimental study on denitrification with microwave induced activated carbon excited plasma jet
.....YANG Guangdong, SU Lin, ZOU Zhixue, JIANG Tao (1054)
- Performance and mechanism of electrolytic manganese slag slurry for flue gas desulfurization
.....NIE Zimeng, YANG Dian, XIONG Yulu, LI Yingjie, TIAN Senlin, NING Ping (1063)

Perspective

- Exploration of hydrogen sources for the low-carbon and green production in the steel industry in China
.....ZHOU Ying, ZHOU Hongjun, XU Chunming (1073)
- Construction of green emission reduction system under the constraint of carbon neutrality
.....TIAN Yuanyu, QIAO Yingyun, ZHANG Yongning (1078)

Executive Editor: ZHENG Yuyin

English Consultant: GUO Meifang, JIN Rencun, LI Baoqing, LONG Bingwen, WANG Yundong