

- 《中国学术期刊综合评价数据库》统计源刊
- 《中国期刊全文数据库》全文收录期刊
- 《中国核心期刊(遴选)数据库》全文收录期刊

- 美国《化学文摘》(CA)重点收录期刊
- 全国石油和化工行业优秀期刊
- 广东省、广州市优秀科技期刊

ISSN 1001-9677

CN44-1228/TQ

广州化工

GUANGZHOU CHEMICAL INDUSTRY

广州化工研究设计院

广州市化工行业协会

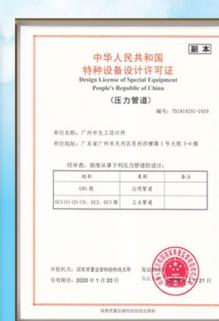
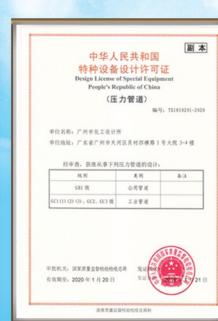
广州市化学化工学会

广州市化工设计所



本所持有化工、建筑、城镇燃气工程设计资质证书，特种设备设计许可证（压力管道、压力容器），工程咨询资格证书，通过ISO9001质量管理体系认证。

多年来，完成数千项建设项目的工程咨询、设计，产品涉及石油化工、无机化工、有机化工、精细化工、医药化工、供热、仓储等行业以及公用工程、建筑、燃气等领域，客户遍及省内外20多个市及地区。



地址：广州市黄埔大道中员村四横路1号大院1号3-4楼

电话：(020)-85528476、85550775、85521117、18022350437 (吴工) E-mail: gzcidi@126.com
万方数据

第18期
2017年9月
(下半月)
第45卷

广州化工

GUANGZHOU HUAGONG

《中国学术期刊综合评价数据库》统计源刊
《中国核心期刊(遴选)数据库》全文收录期刊

《中国期刊全文数据库》全文收录期刊

高、中级化工职称资格评审认定期刊

1973 年创刊(半月刊)

第 45 卷第 18 期

2017 年 9 月(下半月)

主 管:广州化工集团有限公司

主 办:广州化工研究设计院

广州市化工行业协会

协 办:广州市化学化工学会

编辑出版:《广州化工》编辑部

主 编:吴文莉

副 主 编:林珺颖

编 辑:刘倩婷、何启宏

广 告:茅仁旭

地 址:广州市白云区石井镇联和路 2 号

万力创新园 D 座

邮 码:510425

电 话:(020)36372165

邮 箱:gzhgbjb@vip.126.com

网 址:<http://www.gzhgbjb.cn>

印 刷:南方医科大学广州广卫印刷厂

发行范围:国内外公开发行

国外发行:中国出版对外贸易总公司
(北京 782 信箱)

国际标准刊号:ISSN1001-9677

国内统一刊号:CN44-1228/TQ

广告经营许可证:穗工商广字 4401004002668 号

出版物经营许可证:新出发粤刊总批字第 226 号

收款单位:广州化工研究设计院

开户银行:广州市工商银行石井支行

帐 号:3602025309000823574

国内定价:13.00 元/期 全年 295.00 元(共 24 期)

第八届编委会成员名单

主任:崔英德

副主任:叶家灿 白 莉

秘书长:张 统

委员:(排名不分先后)

钱 宇 童叶翔 余 林 王乐夫 何榕友

杨育农 马小明 郑 成 麦堪成 彭 峰

赵建青 尹国强 刘自力 李大光 杨定乔

黄道平 李攻科 刘国光 陈国华 董新法

方岩雄 刘晓国 李雪辉 陈旭东 李锡安

梁基照 熊 亚 曾庆焕 罗国钦 余慧文

目 次

专论与综述

- 银催化的端炔羧化偶联合成 2-炔酸酯 王琨, 黄斌, 陈琳琳, 方成涛, 李震(1)
银杏内酯药代动力学及其剂型的研究进展 黄平, 周兴卓, 毛坤军, 叶颖俊(3)
长余辉发光材料研究进展 吕艳玲(6)
基于精馏提纯的六氟化硫气体净化处理技术研究 陈敏(8)
发酵食品的风味物质及其检测方法研究进展 毛海立, 代文, 杨艳(10)
沥青老化表征手段研究综述 赵克宏, 乌兰, 张国宏(14)
离子液体在结晶及多晶型转化领域的应用 赵晶, 游其华, 沈金海, 罗洋辉(16)
对石膏砌块生产及应用前景的探讨 李国龙, 于南树, 孟昭颂, 相利学(19)

科学实验

- 缩聚型聚羧酸减水剂的合成及性能研究 李申桐, 刘金芝, 杨勇, 冉千平(21)
再生纤维素掺杂纳米 SiO₂复合膜的制备及性能分析 尚倩倩, 胡立红, 胡云, 刘承果, 周永红(24)
芳氧基聚磷腈玻璃化温度的分子动力学模拟 乔青安, 李秋娴, 郭振良, 魏玲, 王华阳(28)
Bi-N-F-TiO₂光催化剂降解对氯苯酚的动力学研究 李巍巍, 周淑颖, 纪晓婷(32)
5-氨基乙酰丙酸盐酸盐的合成新方法 庄文明, 李素华, 朱孔杰, 于南树(34)
A356 铝合金中夹杂物的研究 王炜, 陈红(36)
基于微波技术制备 rGO-Fe₃O₄/空心玻璃微珠吸波粒子 王伟洁, 张一凡, 李强, 何超, 杨迪, 李伟(39)

高温钎料 BCu69NiMnCoSiB 的制备	李银娥, 姜 婷(42)
微波辐照合成氟化聚乙烯醇接枝共聚物	杨嘉玺, 张全伟(44)
果胶负载金属催化剂制备苯甲酸的研究	张 雄, 朱妙琴, 王 莉(47)
水性胶黏剂聚合稳定性及残余单体处理的研究	张 娅, 谢克难, 李世航, 龙 沁(49)
法匹拉韦的合成	任昱霖, 刘丰良(52)
壳聚糖对脆弱丝绸的加固保护初探	程 娟(54)
壳聚糖-二氧化硅纳米多孔材料的制备及 pH 敏感性	解玉玲, 林 晓, 王 锐, 彭新生(57)
姜厚朴微粉化的多指标加权分析	翁德会, 胡慧芬, 沈 雨, 许腊英(60)
O ₃ -H ₂ O ₂ 预处理提高农药废水处理效果生产性试验研究	焦 海, 杨 峰, 戴建军(63)
蛭石吸附亚甲基蓝的性能研究	陈明鸽, 白小虎, 张莲莲, 葛振红(66)
枯草芽孢杆菌液体发酵培养基成分优化研究	阙 斐(68)
紫甘薯色素的磷酸提取工艺研究	刘 玮, 王华平, 羊初女, 周春姣, 董新荣(71)
前处理对压铸铝合金氧化膜耐蚀性的影响研究	李海丰, 刘平涛(75)
Pt ₃ Fe/MWCNTs 燃料电池催化剂的制备及性能研究	廖明佳, 乔 雷(78)
四氧化三铁/介孔生物玻璃复合骨水泥的制备及其理化性能研究	尧冬才(81)

分析测试

显微红外光谱法分析塑料合金材料	李卫领, 何超雄, 庞承焕, 吴 博(84)
气相色谱-质谱联用法测定茶叶中 17 种农药残留	刘 慧, 徐 怡, 游 燕, 牛延菲, 普冰清, 和东阳(87)
ICP-MS 测定西藏辉钼矿石中微量铼	柳 诚, 陈洪流, 李永林, 苏思强, 次仁曲总(90)
HPLC 法测定克霉唑阴道片中咪唑含量的方法研究	刘 娜, 谢子立, 吴小英, 王 眇, 刘倩倩, 辛 洁(92)
安培检测-离子色谱法测定固废中痕量氯根离子	林 冬, 郭晶晶, 王 鑫(95)
电感耦合等离子体发射光谱法测定锑矿石中的锑	冯源强, 王烨彬, 苏思强, 周会东, 王 祝, 李明礼(98)
没食子酸修饰纳米金探针高灵敏检测三聚氰胺	谷苗苗, 沈翊涵(101)
PTMG 中冠醚分析方法的研究	徐 丹, 高振华, 刘 照, 许钦一, 金振宇(103)
印染废水中 PFCs 的检测	薛丽花(106)
HPLC 法测定小儿咳喘灵中麻黄碱、伪麻黄碱的含量	彭 玲, 朱倩云, 张 洁, 李成网(112)
固相萃取离子色谱法测定污水中可吸附有机卤素	印 成, 李显芳, 张继蓉(115)
不同方法提取白术花挥发油的比较研究	冉晓燕, 梁志远, 甘秀海, 吴 坤(118)
酒石酸长春瑞滨中催化剂银残留的 ICP-MS 法测定	谢浙裕, 朱琳娇, 章少勇(122)

环境保护

乐清湾海域 COD 分布特征及对富营养化贡献分析	刘俊峰, 叶 深, 张华伟, 邓 睿(124)
朱家尖海域沉积物中重金属监测及其潜在生态风险评价	王范盛, 李子孟, 钟 志, 金衍健, 朱 剑(127)

燃煤电厂中的环保设备流场及浓度场研究现状	吕小林(130)
遥感监测汽车尾气中 CO 和 HC 的研究	邵 勇(133)
絮凝沉淀-厌氧/好氧法处理电池生产废水	施 龙(136)
钢厂协同处置城市固体废弃物的实践与探索	夏 盛,童 敏,封羽涛(138)
便携式 GC-MS 在线监测空气中 VOCs 的应用研究	许百环(141)

化工机械

浅析低温甲醇洗工艺中的绕管式换热器	高美莹(145)
-------------------	----------

生产技术

循环氢脱硫系统带液分析	赵倩倩,耿镇镇(147)
PAO 型基础油性质及应用探究	张俊杰,陈炳耀,杨善杰,潘津炼,薛 飞(150)
基于质量源于设计理念开发注射液生产工艺	史宣宇(152)

教学园地

应用型本科院校物理化学教学改革的探索	吴小梅,胡 猛,刘维俊(155)
环境工程设计课程教学改革和探索	王胜强,王 庆,于宏兵(158)
基于微视频的药剂学实验课程教学的思考与探索	吴德智,李 安,张 翊,李小红(160)
化学科技论文常用英文词汇探讨——以药物化学为例	庄春林,缪震元(162)
大学《有机波谱分析》课程教学的几点体会	崔永梅,谭启涛(166)
绿色化教学模式在毒物分析实验教学中的应用	陈学国,王明志(168)
互联网+背景下《食品卫生学》教学改革与探讨	陈 佳,邓源喜,满 云,刘登勇,许 晖(170)
基于产教融合的有机化学实验模拟软件的应用	李 霄,高立国,宋小利,刘慧瑾,霍文兰,刘晓菊(172)
地方院校新建高分子专业人才培养模式探索	李丽霞,任金忠,齐双春,赵晓雅,孙会娟(174)
工科院校《环境化学》课程建设与改革	祝 方(176)
依托化工设计竞赛推动应用型化工人才的培养	陈玉凤,胡榕华(179)
浅谈分层方法在中学化学教学设计中的应用	师葛莹,唐怀忠,杨 雪,程 芳,张月梅(181)
煤化学课程智慧化教学模式探索与实践	汤洁莉,马 晶,宋永辉(183)
关于提高学术学位硕士研究生创新能力的探索与实践	殷 燕(185)
对大学化学教学中培养学生创新思维能力的探讨	张美丽(187)
普通高校制药工程专业药剂学试卷分析及探讨	李 妍,曹珂珂,王 婕,闫利萍(189)
从工程教育专业认证出发对《塑料成型机械》课程的教学改革	裴 莹,刘 捷,汤克勇(192)
基于企业对安全专业人才的需求谈高校人才培养	魏春荣,张保勇,张迎新,孙建华,王亚军(194)

CONTENTS

Silver-catalyzed Carboxylative Coupling of Terminal, CO ₂ , Alkynes and Organohalides Towards 2-alkynoates	WANG Kun, HUANG Bin, CHEN Lin-lin, FANG Cheng-tao, LI Zhen(1)
Research Progress on Pharmacokinetic Study and Dosage Form of Ginkgo Terpene Lactones	HUANG Ping, ZHOU Xing-zhuo, MAO Kun-jun, YE Ying-jun(3)
Research Progress on Long Afterglow Phosphors	LV Yan-ling(6)
Study on Purification Technique of SF ₆ Based on Distillation	CHEN Min(8)
Research Progress on Flavor Substances in Fermented Foods and Their Detection Methods	MAO Hai-li, DAI Wen, YANG Yan(10)
Review on Characterization of Asphalt Aging	ZHAO Ke-hong, WU Lan, ZHANG Guo-hong(14)
Application and Development of Ionic Liquids in Crystallization and Polymorphic Transformation	ZHAO Jing, YOU Qi-hua, SHEN Jin-hai, LUO Yang-hui(16)
Discussion on Production and Application Prospect of Gypsum Block	LI Guo-long, YU Nan-shu, MENG Zhao-song, XIANG Li-xue(19)
Performance Evaluation of Polycarboxylate Superplasticizer Synthesized through Condensation Polymerization	LI Shen-tong, LIU Jin-zhi, YANG Yong, RAN Qian-ping(21)
Preparation and Characterization of Composite Films Based on Regenerated Cellulose Doped with SiO ₂ Nanoparticles	SHANG Qian-qian, HU Li-hong, HU Yun, LIU Cheng-guo, ZHOU Yong-hong(24)
Molecular Dynamic Simulations for Glass Transition Temperatures of Polyaryloxyphosphazenes	QIAO Qing-an, LI Qiu-xian, GUO Zhen-liang, WEI Ling, WANG Hua-yang(28)
Kinetics of Bi-N-F-TiO ₂ Induced Photocatalytic Degradation of 4-Chlorophenol	LI Wei-wei, ZHOU Shu-ying, JI Xiao-ting(32)
A Novel Synthetic Method of 5-Aminolevulinic Acid Hydrochloride	ZHUANG Wen-ming, LI Su-hua, ZHU Kong-jie, YU Nan-shu(34)
Study on Inclusion in A356 Aluminum Alloy	WANG Wei, CHEN Hong(36)
Fabrication of Microwave Absorbing Particles with rGO-Fe ₃ O ₄ Coated Hollow Glass Microspheres Based on Microwave Reduction Technique	WANG Wei-jie, ZHANG Yi-fan, LI Qiang, HE Chao, YANG Di, LI Wei(39)
Preparation of High Temperature Solder BCu69NiMnCoSiB Alloy	LI Yin-e, JIANG Ting(42)
Microwave-assisted Synthesis of Fluorinated Poly(vinyl alcohol) Graft Copolymer	YANG Jia-xi, ZHANG Quan-wei(44)
Preparation of Benzaldehydeb Metal Catalyst Loaded on Pectin	ZHANG Xiong, ZHU Miao-qin, WANG Li (47)
Study on Stability of Water-based Vac-acrylate Emulsion Adhesives and Disposition of Residual Monomer	ZHANG Ya, XIE Ke-nan, LI Shi-hang, LONG Qin(49)
Synthesis of Favipiravir	REN Yu-lin, LIU Feng-liang(52)
Consolidation of Fragile Silk Treated with Chitosan	CHENG Juan(54)
Preparation of Chitosan-silica Materials with Nanoporous Structure and pH-dependent Property as Drug Carrier	XIE Yu-ling, LIN Xiao, WANG Rui, PENG Xin-sheng(57)
Multi Index Weighted Analysis of Jiang Magnolia Micronization	WENG De-hui, HU Hui-fen, SHEN Yu, XU La-ying(60)
Experimental Study on Improving Production Efficiency of Pesticide Wastewater by O ₃ -H ₂ O ₂ Pretreatment	JIAO Hai, YANG Feng, DAI Jian-jun(63)
Study on Adsorption Performance of Methylene Blue Using Vermiculite	CHEN Ming-ge, BAI Xiao-hu, ZHANG Lian-lian, GE Zhen-hong (66)
Optimization of Liquid Fermentation Medium Composition of Bacillus Subtilis	QUE Fei(68)
Study on Extraction of Pigment from Purple Sweet Potato by Phosphoric Acid Aqueous Solution	LIU Wei, WANG Hua-ping, YANG Chu-nv, ZHOU Chun-jiao, DONG Xin-rong(71)

Effect of Pretreatment on Corrosion Resistance of Oxide Film on Die Casting Aluminum Alloy .....	.....	LI Hai-feng , LIU Ping-tao(75)
Preparation and Performance Study on Pt ₃ Fe/MWCNTs Fuel Cell Catalyst .....	.....	LIAO Ming-jia , QIAO Lei(78)
Preparation of Magnetite/Mesoporous Bioglass Composite Cements and Their Physicochemical Properties .....	.....	YAO Dong-cai(81)
Analysis of Plastic Alloy Materials by Microscopic Infrared Spectroscopy .....	.....	.....
.....	.....	LI Wei-ling , HE Chao-xiong , PANG Cheng-huan , WU Bo(84)
Simultaneous Determination of 17 Pesticide Residues in Tea by GC-MS .....	.....	.....
.....	.....	LIU Hui , XU Yi , YOU Yan , NIU Yan-fei , PU Bing-qing , HE Dong-yang(87)
Determination of Trace Rhenium in Molybdenum Ores by Inductively Coupled Plasma Mass Spectrometry in Tibet .....	.....	.....
.....	.....	LIU Cheng , CHEN Hong-liu , LI Yong-lin , SU Si-jiang , CIREN Qu-zong(90)
Determination of Imidazole in Clotrimazole Vaginal Tablets by High Performance Liquid Chromatography .....	.....	.....
.....	.....	LIU Na , XIE Zi-li , WU Xiao-ying , WANG Ye , LIU Qian-qian , XIN Jie(92)
Determination of Trace Cyanide in Solid Waste by Ion Chromatography with Ampere Detector .....	.....	.....
.....	.....	LIN Dong , GUO Jing-jing , WANG Xin(95)
Determination of Sb in Antimony Ores by Inductively Coupled Plasma-atomic Emission Spectrometry .....	.....	.....
.....	.....	FENG Yuan-qiang , WANG Ye-bin , SU Si-jiang , ZHOU Hui-dong , WANG Zhu , LI Ming-li(98)
Sensitive Detection of Melamine Using Gallic Acid-capped Gold Nanoparticles .....	.....	.....
.....	.....	GU Miao-miao , SHEN Yi-han(101)
Study on Analysis of Crown Polytetrahydrofuran in PTMG .....	.....	.....
.....	.....	XU Dan , GAO Zhen-hua , LIU Zhao , XU Qin-yi , JIN Zhen-yu(103)
Determination of PFCs in Dyeing Waste Water .....	.....	XUE Li-hua(106)
Determination of Hydrochloric Acid Ephedrine and Hydrochloric Acid Pseudoephedrine in Xiaoerkechuanling Granules .....	.....	PENG Ling , ZHU Qian-yun , ZHANG Jie , LI Cheng-wang(112)
Determination of Adsorbable Organic Halogen in Sewage by Solid Phase Extraction Ion Chromatography .....	.....	.....
.....	.....	YIN Cheng , LI Xian-fang , ZHANG Ji-rong(115)
Comparison of Volatile Oil of Flowers from <i>Atractylodes macrocephala</i> Extracted by Different Methods .....	.....	.....
.....	.....	RAN Xiao-yan , LIANG Zhi-yuan , GAN Xu-hai , WU Kun(118)
Determination of Residual Silver of Catalysts in Vinorelbine Tartrate by ICP-MS .....	.....	.....
.....	.....	XIE Zhe-yu , ZHU Lin-jiao , ZHANG Shao-yong(122)
Temporal and Spatial Distributions of COD and Its Contribution to Eutrophication in Yueqing Bay .....	.....	.....
.....	.....	LIU Jun-feng , YE Shen , ZHANG Hua-wei , DENG Rui(124)
Potential Ecological Risk of Heavy Metals in Surface Sediments of Zhujiajian Sea Region in Zhoushan .....	.....	.....
.....	.....	WANG Fan-sheng , LI Zi-meng , ZHONG Zhi , JIN Yan-jian , ZHU Jian(127)
Research Progress on Hydrodynamics in Environmental Protection Equipment .....	.....	.....
.....	.....	LV Xiao-lin(130)
Application of Remote Sensing Monitoring in Detection of CO and HC of Vehicle Exhaust Gas .....	.....	.....
.....	.....	SHAO Yong(133)
Treatment of Battery Production Wastewater by Flocculation-anaerobic/aerobic Process .....	.....	.....
.....	.....	SHI Long(136)
Practice and Exploration on Co-processing of Municipal Solid Waste by Steel Mill .....	.....	.....
.....	.....	XIA Sheng , TONG Min , FENG Yu-tao(138)
Efficiency Assessment of Portable GC-MS for On-line Monitoring of Volatile Organic Compounds in Air .....	.....	.....
.....	.....	XU Bai-huan(141)
A brief Analysis of Tube Type Heat Exchanger in Low Temperature Methanol .....	.....	.....
.....	.....	GAO Mei-ying(145)
Analysis of Off-gas with Liquid in Recycle Hydrogen Desulfurization System .....	.....	.....
.....	.....	ZHAO Qian-qian , GENG Zhen-zhen(147)
Study on Properties and Application of Type PAO Base Oil .....	.....	.....
.....	.....	ZHANG Jun-jie , CHEN Bing-yao , YANG Shan-jie , PAN Jin-lian , XUE Fei(150)
Manufacturing Process Development of Injectable Drug Product Based on Quality by Design .....	.....	.....
.....	.....	SHI Xuan-yu(152)

- Exploration on Physical Chemistry Teaching Reformation of Application-oriented Universities WU Xiao-mei, HU Meng, LIU Wei-jun(155)
- Teaching Reform and Practice on Course of Environmental Engineering Design WANG Sheng-qiang, WANG Qing, YU Hong-bing(158)
- Thinking and Exploration of Pharmaceutics Experiment Class Based on Micro Video WU De-zhi, LI An, ZHANG Yi, LI Xiao-hong(160)
- Discussion on Commonly Used English Vocabulary in Chemistry Scientific Papers——Taking Medicinal Chemistry as An Example ZHUANG Chun-lin, MIAO Zhen-yuan(162)
- Some Teaching Experiences on Organic Spectroscopic Analysis Course for College Students CUI Yong-mei, TAN Qi-tao(166)
- Application of Green Chemistry Teaching Mode in Experimental Teaching of Forensic Toxicological Analysis CHEN Xue-guo, WANG Ming-zhi(168)
- Teaching Reform and Discussion of Food Hygiene under the Background of Internet+ CHEN Jia, DENG Yuan-xi, MAN Yun, LIU Deng-yong, XU Hui (170)
- Application of Simulation Software of Organic Chemistry Experiment Based on Integration of Production and Education LI Xiao, GAO Li-guo, SONG Xiao-li, LIU Hui-jin, HUO Wen-lan, LIU Xiao-ju(172)
- Exploration on Cultivation Model of New Polymer Professional in Local Colleges LI Li-xia, REN Jin-zhong, QI Shuang-chun, ZHAO Xiao-ya, SUN Hui-juan(174)
- Course Construction and Innovation of Environmental Chemistry in Engineering Colleges ZHU Fang(176)
- Practice on Training of Application Talents Depended on National Chemical Design Contest CHEN Yu-feng, HU Rong-hua(179)
- A Brief Talk on Application of Stratified Teaching in Middle School Chemistry Teaching Design SHI Ge-ying, TANG Huai-zhong, YANG Xue, CHENG Fang, ZHANG Yue-mei(181)
- Study and Practical Exploration of Wisdom in Coal Chemistry Course Teaching Model TANG Jie-li, MA Jing, SONG Yong-hui(183)
- Exploration and Practiceon Improvement of Academic Degree Graduate Student's Innovation Abilities YIN Yan(185)
- Discussion on Developing Students' Creative Thinking Ability in College Chemistry Teaching ZHANG Mei-li(187)
- Examination Paper Analysis and Discussion of Pharmaceutics of Pharmaceutical Engineering Mayor in Regular Colleges LI Yan, CAO Ke-ke, WANG Di, YAN Li-ping(189)
- Teaching Reform of Plastic Forming Machinery Course from Certification of Engineering Specialty PEI Ying, LIU Jie, TANG Ke-yong(192)
- Cultivation of College Talents on Enterprises Requirements for Security Engineering Personnel WEI Chun-rong, ZHANG Bao-yong, ZHANG Ying-xin, SUN Jian-hua, WANG Ya-jun(194)

GUANGZHOU CHEMICAL INDUSTRY

Open Publishing

Established in 1973 (Semimonthly)

Vol. 45 No. 18

Sep. 2017

Managed by:

Guangzhou Chemical Industrial Group Co., Ltd.

Sponsored by:

Guangzhou Research & Design Institute of Chemical Industry

Guangzhou Society of Chemistry and Chemical Engineering

Assisted by:

Guangzhou Chemical Industry Association

Edited by:

Editorial Office of "GUANGZHOU CHEMICAL INDUSTRY"

Chief Editor: WU Wen-li

Vice Chief Editor: LIN Jun-ying

Editor: LIU Qian-ting, HE Qi-hong

Advertisement Department: MAO Ren-xu

Address: Building D, Vanlead Innovation Park, No. 2

Lianhe Road, Shijing Town, Baiyun District,

Guangzhou, P. R. China

Postcode: 510425

Tel: (020) 36372165

E-mail: gzhgbjb@vip.126.com

Website: <http://www.gzhgbjb.cn>

Printed by:

Guangzhou Guangwei Printing Plant of Southern Medical University

Overseas Distributed by:

China National Publishing Industry Trading Corporation

Journal Code: ISSN 1001-9677
CN 44-1228/TQ

Adverxising Business License No. 4401004002668