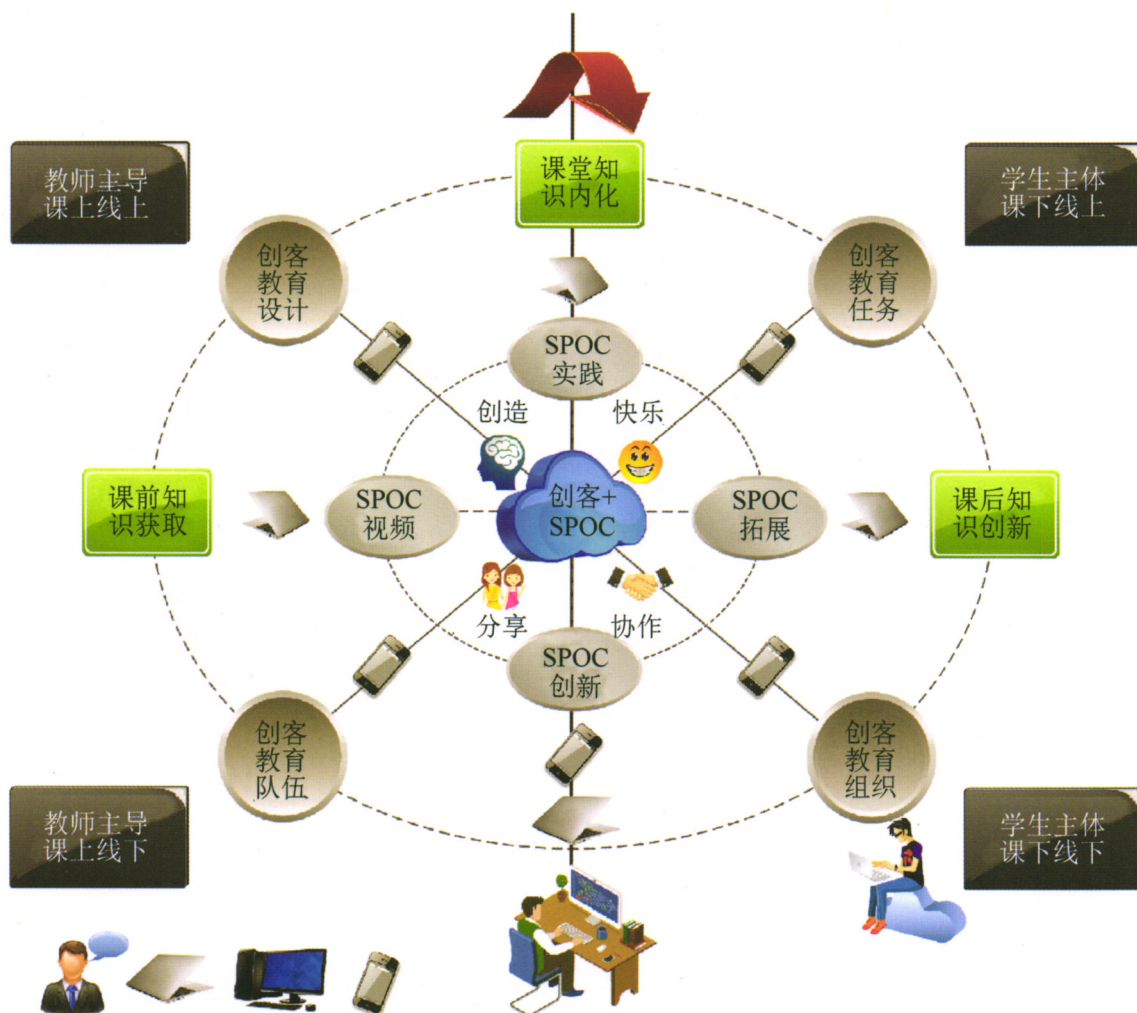


# 化学教育(中英文)

Chinese Journal of Chemical Education

2018年 第39卷 第14期 Vol.39 No.14



邮发代号: 2-106

ISSN 1003-3807



HUAXUE JIAOYU

万方数据



主管: 中国科学技术协会  
主办: 中国化学会  
北京师范大学

# CHINESE JOURNAL OF CHEMICAL EDUCATION

2018 Vol. 39 No. 14

Sponsored by Chinese Chemical Society and Beijing Normal University

## Chemistry-Life-Society

Intermolecular Noncovalent Interactions:  $\sigma$ -Hole Bond and  $\pi$ -Hole Bond ..... CUI Yu-Jin JIN Wei-Jun (1)

## Theory Teaching

Establishment of the Concept of Reciprocal Lattice from Ewald Diagram Explanation on Bragg Equation .....  
..... MA Jun XIONG Xin-Bo LI Xiao-Hua YANG Hai-Peng LIANG Wen-Lang (12)

T-x Diagrams in Phase Equilibrium System of Two Component ..... YANG Hua (16)

Application of Relevance Method and Analogy Method in Biochemistry Teaching .....  
..... WANG Shao-Ru TIAN Tian ZHOU Xiang (23)

## Experiment Teaching

Quasi-Inquiry Basic Chemistry Experiment: Content Analysis of Powdery CuO from Different Sources and Its Effect on the Yield of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  ..... WANG Xiao-Yan WANG Jing LUO Shi-Zhong XIE Cong-Xia LI Hui-Ping (27)

Synthesis and Characterization of Anti-HCV Drug Sofosbuvir: Undergraduate "Summer Short Semester" Comprehensive Experiment ..... CAI Yan CAI Guo-Wei ZHOU Wei-Hong Munira • Abudukeremu MIAO Zhi-Wei (31)

Design of Comprehensive Experiment for Fluorescent Switches of Graphene Quantum Dots .....  
..... JI Shuai-Jie GUO Li-Hua DAI Du-Juan ZHANG Lei GONG Pei-Wei  
LIU Zhi-Ang LIU Zhe (38)

"Maker Education+SPOC" Flipped Experiment Teaching: Determination of Trace Impurity Iron in Hydrogen Phosphate Products as Example ..... XIE Ai-Juan TAO Yu-Wei LUO Shi-Ping XUE Bing (44)

## Teacher Education

Construction of Curriculum System of Chemistry Major in Normal Universities in View of National Examination of Teacher Certificate ..... LIANG Yong-Feng ZHANG Zhi-Feng LI Jia-Hui YAN Ya-Ni WANG Jia-Jia (49)

## Vocational Education

Green Industrial-Oriented Experimental Course System for High Vocational Pharmaceutical Production Technology Major Under the Integration of Production and Education ..... FU Shen-Na (54)

## Chemical Education for Non-Chemistry Majors

Exploration of Project-Oriented Laboratory Curriculum for Pharmaceutical-Majored Students .....  
..... ZHOU Zi-Niu XIE Jun-Li PENG Xin (59)

Comprehensive Environmental Chemistry Experiment: Preparation and Characterization of MgAl-LDHs and Its Adsorption Effect on Disinfection Byproduct in Water ..... YANG Yi-Qiong DING Qiao ZHANG Xiao-Dong (63)

## Information Technology and Chemistry

Application and Evaluation of We-Media in College Chemistry Experiment Teaching .....  
..... CHEN Yi-Bo LI Nan LIU Zhao-Qing WANG Jing ZHOU Ai-Ju CHEN Bo (67)

Design and Application of On-Line Chemistry Experiment Safety Examination System .....  
..... WANG Yuan-Bao HAO Yan LI Qing YANG Xiao-Li ZHANG Xi-Jun (72)

## Discussion and Thinking of Questions

Hybrid State of Carbonyl Oxygen Atom in Aldehyde and Ketone .....  
..... YUAN Kun LIU Yan-Zhi WANG Peng ZHU Yuan-Cheng SHI Xiao-Ning (75)

## Domestic and Overseas Trends

Development and Innovation of College Students' Chemistry Contest of Zhejiang Province .....  
..... ZENG Xiu-Qiong CAI Ji-Qing FANG Wei-Min LI Ning WANG Guo-Ping MAO Zhen-Jun (78)

## 化学教育(中英文)

(半月刊·1980年创中文刊·2017年变更为中英文刊)

2018年 第39卷 第14期 7月18日出版

主管单位 中国科学技术协会  
主办单位 中国化学会 北京师范大学  
编辑出版 《化学教育(中英文)》编辑部  
编辑部地址 北京师范大学化学楼217室  
邮政编码 100875  
电话(传真) 010-58807875  
咨询信箱 hxjy-jce@263.net  
投稿网址 http://www.hxjy.org

顾问 刘知新  
主编 刘正平  
副主编 李艳梅 孙世刚 王磊 王祖浩  
杨屹 杨振忠 郑长龙 朱玉军(专职)  
刊名题字 戴安邦  
印刷装订 保定华泰印刷有限公司  
总发行处 中国邮政集团公司北京市报刊发行局  
订 阅 全国各地邮局

刊号 ISSN 1003-3807  
CN 10-1515/O6

国内邮发代号 2-106

国外发行代号 M3070

定价 16.00元

## 目次

## 化学·生活·社会

分子间的非共价相互作用： $\sigma$ -穴键和 $\pi$ -穴键····· 崔瑜瑾 晋卫军 (1)

## 理论教学

从 Bragg 方程的 Ewald 图建立倒易点阵概念····· 马俊 熊信柏 黎晓华 杨海鹏 梁文朗 (12)

二组分平衡体系的  $T-x$  相图····· 杨桦 (16)

关联法和类比法在生物化学教学中的应用····· 王少儒 田涸 周翔 (23)

## 实验教学

准研究性基础化学实验：不同来源氧化铜含量分析及对制备  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  产率的影响·····  
····· 王小燕 王静 罗世忠 解从霞 李会平 (27)

抗 HCV 药物索非布韦的合成与表征——本科生“夏季小学期”创新科研实践·····  
····· 蔡岩 蔡国伟 周卫红 木尼热·阿布都克力木 苗志伟 (31)

石墨烯量子点荧光开关综合实验的设计····· 吉帅洁 郭丽华 戴杜娟 张蕾 公培伟 刘志昂 刘哲 (38)

“创客教育+SPQC”翻转实验教学模式研究——以磷酸氢二钠产品中微量杂质铁的测定为例·····  
····· 谢爱娟 陶宇炜 罗士平 薛冰 (44)

## 教师教育

教师资格证国家考试视野下高师本科化学专业课程体系构建····· 梁永锋 张志峰 李嘉会 闫亚妮 王佳佳 (49)

## 职业教育

产教融合下的高职“绿色生产链”实验课程体系——以药品生产技术专业为例····· 傅深娜 (54)

## 非化学专业化学教育

制药专业药物合成实践课程项目化教学探索····· 周子牛 谢俊莉 彭昕 (59)

环境化学综合设计实验：镁铝水滑石的制备、表征及其对水中消毒副产物的吸附作用····· 杨一琼 丁乔 张晓东 (63)

## 信息技术与化学

自媒体在大学化学实验教学中的应用与评价····· 陈漪勃 李楠 刘兆清 王静 周爱菊 陈博 (67)

在线化学实验安全考试系统的设计与应用····· 王元宝 郝燕 李青 杨小丽 张西军 (72)

## 问题讨论与思考

醛酮类有机物中羰基氧原子的杂化状态····· 袁焜 刘艳芝 王鹏 朱元成 施小宁 (75)

## 国内外动态

浙江省大学生化学竞赛模式的发展与创新····· 曾秀琼 蔡吉清 方卫民 李宁 王国平 毛侦军 (78)

封面图片····· (45)

2018年《化学教育》订阅办法····· (71)

本期责任编辑 杨金瑞

# CHINESE JOURNAL OF CHEMICAL EDUCATION

2018 Vol. 39 No. 14

Sponsored by Chinese Chemical Society and Beijing Normal University

## Chemistry-Life-Society

Intermolecular Noncovalent Interactions:  $\sigma$ -Hole Bond and  $\pi$ -Hole Bond ..... CUI Yu-Jin JIN Wei-Jun (1)

## Theory Teaching

Establishment of the Concept of Reciprocal Lattice from Ewald Diagram Explanation on Bragg Equation .....  
..... MA Jun XIONG Xin-Bo LI Xiao-Hua YANG Hai-Peng LIANG Wen-Lang (12)

T-x Diagrams in Phase Equilibrium System of Two Component ..... YANG Hua (16)

Application of Relevance Method and Analogy Method in Biochemistry Teaching .....  
..... WANG Shao-Ru TIAN Tian ZHOU Xiang (23)

## Experiment Teaching

Quasi-Inquiry Basic Chemistry Experiment: Content Analysis of Powdery CuO from Different Sources and Its Effect on the Yield of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  ..... WANG Xiao-Yan WANG Jing LUO Shi-Zhong XIE Cong-Xia LI Hui-Ping (27)

Synthesis and Characterization of Anti-HCV Drug Sofosbuvir: Undergraduate "Summer Short Semester" Comprehensive Experiment ..... CAI Yan CAI Guo-Wei ZHOU Wei-Hong Munira • Abudukeremu MIAO Zhi-Wei (31)

Design of Comprehensive Experiment for Fluorescent Switches of Graphene Quantum Dots .....  
..... JI Shuai-Jie GUO Li-Hua DAI Du-Juan ZHANG Lei GONG Pei-Wei  
LIU Zhi-Ang LIU Zhe (38)

"Maker Education+SPOC" Flipped Experiment Teaching: Determination of Trace Impurity Iron in Hydrogen Phosphate Products as Example ..... XIE Ai-Juan TAO Yu-Wei LUO Shi-Ping XUE Bing (44)

## Teacher Education

Construction of Curriculum System of Chemistry Major in Normal Universities in View of National Examination of Teacher Certificate ..... LIANG Yong-Feng ZHANG Zhi-Feng LI Jia-Hui YAN Ya-Ni WANG Jia-Jia (49)

## Vocational Education

Green Industrial-Oriented Experimental Course System for High Vocational Pharmaceutical Production Technology Major Under the Integration of Production and Education ..... FU Shen-Na (54)

## Chemical Education for Non-Chemistry Majors

Exploration of Project-Oriented Laboratory Curriculum for Pharmaceutical-Majored Students .....  
..... ZHOU Zi-Niu XIE Jun-Li PENG Xin (59)

Comprehensive Environmental Chemistry Experiment: Preparation and Characterization of MgAl-LDHs and Its Adsorption Effect on Disinfection Byproduct in Water ..... YANG Yi-Qiong DING Qiao ZHANG Xiao-Dong (63)

## Information Technology and Chemistry

Application and Evaluation of We-Media in College Chemistry Experiment Teaching .....  
..... CHEN Yi-Bo LI Nan LIU Zhao-Qing WANG Jing ZHOU Ai-Ju CHEN Bo (67)

Design and Application of On-Line Chemistry Experiment Safety Examination System .....  
..... WANG Yuan-Bao HAO Yan LI Qing YANG Xiao-Li ZHANG Xi-Jun (72)

## Discussion and Thinking of Questions

Hybrid State of Carbonyl Oxygen Atom in Aldehyde and Ketone .....  
..... YUAN Kun LIU Yan-Zhi WANG Peng ZHU Yuan-Cheng SHI Xiao-Ning (75)

## Domestic and Overseas Trends

Development and Innovation of College Students' Chemistry Contest of Zhejiang Province .....  
..... ZENG Xiu-Qiong CAI Ji-Qing FANG Wei-Min LI Ning WANG Guo-Ping MAO Zhen-Jun (78)

## 化学教育(中英文)

(半月刊·1980年创中文刊·2017年变更为中英文刊)

2018年 第39卷 第14期 7月18日出版

主管单位 中国科学技术协会  
主办单位 中国化学会 北京师范大学  
编辑出版 《化学教育(中英文)》编辑部  
编辑部地址 北京师范大学化学楼217室  
邮政编码 100875  
电话(传真) 010-58807875  
咨询信箱 hxjy-jce@263.net  
投稿网址 http://www.hxjy.org

顾问 刘知新  
主编 刘正平  
副主编 李艳梅 孙世刚 王磊 王祖浩  
杨屹 杨振忠 郑长龙 朱玉军(专职)  
刊名题字 戴安邦  
印刷装订 保定华泰印刷有限公司  
总发行处 中国邮政集团公司北京市报刊发行局  
订 阅 全国各地邮局

刊号 ISSN 1003-3807  
CN 10-1515/O6

国内邮发代号 2-106

国外发行代号 M3070

定价 16.00元