

中国科学技术协会 主管  
中国化学会 主办  
北京师范大学  
全国中文核心期刊

ISSN 1003-3807  
CN 11-1923/O6  
美国化学文摘(CA)收录源期刊

# 化学教育

CHINESE JOURNAL OF CHEMICAL EDUCATION

★《中文核心期刊要目总览》收录期刊

★中国核心期刊(遴选)数据库收录期刊

★中国期刊全文数据库收录期刊

★中国学术期刊综合评价数据库统计源期刊

★维普网收录源期刊

★万方数据库收录期刊



邮发代号：2-106

ISSN 1003-3807



HUAXUE JIAOYU

万方数据



22

第36卷  
2015

# CHINESE JOURNAL OF CHEMICAL EDUCATION

## 2015 Vol. 36 No. 22

Sponsored by Chinese Chemical Society and Beijing Normal University

### Special Topics

- Application of Project Research Mode in Training Problem-solving Ability of Undergraduate Students ..... LI Xue-Feng HOU Ke-Ke(1)

### Investigation on Courses and Teaching Materials

- Current Situation and Countermeasure of Curriculum System Construction of Chemical Engineering in Colleges ..... YAO Wei(5)  
Practice and Reflection on Chemical General Course in Local Universities with Example of *Nice Life and Chemistry* ..... CHEN Kai CHEN Chang-Yun(9)

### Theory Teaching

- Application of Mind-mapping in University Chemistry Teaching with Chemical Equilibrium as Example ..... CHENG Chun-Ying Mhet'er Tu'erhong Abaydulla Alimjan YIN Xue-Bo(15)  
Effect of Electronic Effect on Orientation Effect and Reactivity of Mono-substituted Benzenes ..... CHENG Shao-Ling WANG Hua-Jing XIE Yun-Fu(19)  
Application of Monotonicity of Function and Derivative in Physical Chemistry Teaching ..... SHENG Wang-Qing LIAO Hua ZHU De-Mei(22)  
Application of Situational Teaching in Physical Chemistry Teaching ..... LIU Yuan TANG Bin DU Jun(25)

### Experiment Teaching

- Effect of Key Preparation Parameters on Formation of Basic Copper Carbonate ..... WU Yong-Juan ZHAO Da-Zhou FEI Fei LI Sa-Ying WANG Fu-Min LIU Zhong-Wen(28)  
Inquiry Physical Chemistry Experiment: Preparation and Performances of Graphene Membrane/Nickel Hydroxide Complex Materials ..... XU Juan CAO Jian-Yu CHEN Zhi-Dong(34)  
Experiment Teaching of Fabrication and Photovoltaic Property of Dye-sensitized Solar Cells ..... ZHOU Xiao-Yan ZHANG Ya-Ping HAN Li-Li HAO Hong-Yang(39)  
Suggestions on Teaching Reform of Analytical Chemistry Experiment ..... REN Chun-Yan MA Chuan-Li LV Hai-Tao(42)

### Teacher Education

- Courses Group Construction for Pre-service Chemistry Teacher Education ..... LIU Bao NONG Ying CHEN Yan-Yuan LUO Wei-Qiang TAO Qiang LU Hong-Qing(45)

### Vocational Education

- Teaching Content and Teaching Mode of Higher Vocational Chemistry Based on Experiment ..... FU Xi-Jun(50)

### Chemical Education for Non-Chemistry Majors

- Application of Integration of PBL and LBL Teaching Modes in Organic Chemistry Teaching for Engineering ..... FENG Xi-Lan HU Lin-Feng LI Ying(55)  
Theoretical Teaching of Blood Buffer System ..... ZHANG Qing-Fang HOU Zheng-Li HAO Yi(59)  
Information Technology and Chemistry

- Current Status and Outlook of MOOCs in Chemistry on Network Platforms ..... LEI Ying-Jie LONG Ye(62)  
Cultivation of Autonomous Learning Ability of College Students Based on Chemical Information Retrieval ..... SONG Peng-Fei WANG Rong-Min(67)

### Investigation Report

- Investigation on Students' Perception of Chemistry Laboratory Environment ..... XIN Wan-Xiang ZHOU Shi-Dong YAN Peng-Lin(70)

### Discussion and Thinking of Questions

- Using Electronic Effects to Explain Orientation Effects ..... WANG Qiang(74)

### History of Chemistry and Chemical History Education

- CAO Yuan-Yu: Important Founder of Research on Chemical History of China ..... WANG Feng-Yun PENG Yan-Mei GU Jia-Shan ZHANG Di CHEN Biao(78)

## 化 学 教 育

(半月刊·1980年创刊)

2015年 第36卷 第22期 11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》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  
电子信箱 hxjy-jce@263.net  
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  
杨振忠 郑长龙 朱玉军(专职)  
刊名题字 戴安邦  
印刷装订 河北天普润印刷厂  
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,或本刊编辑部

刊号 ISSN 1003 - 3807  
CN 11 - 1923/O6

国内邮发代号 2-106

国外发行代号 M3070

定价 12.00 元

2015年11月

# 化学教育

第36卷

第22期

## 目 次

### 专论

- 课题研究模式在本科生问题解决能力培养中的应用 ..... 李学峰 侯珂珂 (1)

### 课程与教材研讨

- 高校化工类专业课程体系建设的现状与对策 ..... 姚 薇 (5)

- 地方高校化学主题通识教育课的实践与反思——以“美好生活与化学”课程为例 ..... 陈 凯 陈昌云 (9)

### 理论课教学

- 思维导图法在大学化学教学中的应用——以化学平衡为例 .....

..... 程春英 木合塔尔·吐尔洪 阿里木江·艾拜都拉 尹学博 (15)

- 电子效应对单取代苯定位效应和反应活性的影响 ..... 程绍玲 王华静 谢运甫 (19)

- 函数的单调性和导数在物理化学教学中的运用 ..... 沈王庆 廖 华 朱德梅 (22)

- 情境化教学在物理化学教学中的运用 ..... 刘 源 唐 斌 杜 军 (25)

### 实验课教学

- 制备参数对碱式碳酸铜形成过程的影响 ..... 吴永娟 赵大洲 费 菲 李飒英 王福民 刘忠文 (28)

- 研究型物理化学实验：石墨烯膜/氢氧化镍复合材料的制备及性能研究 ..... 许 娟 曹剑瑜 陈智栋 (34)

- 染料敏化太阳能电池的制作工艺及光伏特性实验教学研究 ..... 周小岩 张亚萍 韩立立 郝洪扬 (39)

- 分析化学实验教学改革的几点建议 ..... 任春艳 马传利 吕海涛 (42)

### 教师教育

- 化学教师教育课程群建设研究 ..... 刘 宝 农 莺 陈艳圆 罗卫强 陶 强 卢红青 (45)

### 职业教育

- 以实验为主线的高职化学教学内容和教学模式研究 ..... 付西军 (50)

### 非化学专业化学教育

- PBL 与 LBL 结合的教学模式在工科有机化学教学中的应用 ..... 冯喜兰 胡林峰 李 英 (55)

- 血液中的缓冲系教学探讨 ..... 张青芳 侯正利 郝 一 (59)

### 信息技术与化学

- 网络平台上的化学 MOOCs 课程现状及其展望 ..... 雷英杰 龙 叶 (62)

- 基于“化学信息检索”课程培养学生自主学习能力 ..... 宋鹏飞 王荣民 (67)

### 调研报告

- 学生对化学实验室环境感知情况的调查研究 ..... 辛万香 周仕东 闫鹏林 (70)

### 问题讨论与思考

- 充分利用电子效应解释苯环定位规律 ..... 王 强 (74)

### 化学史与化学史教育

- 中国化学史研究的重要奠基者曹元宇 ..... 汪丰云 彭艳梅 顾家山 张 迪 陈 麒 (78)

- 欢迎订阅 2016 年《化学教育》 ..... (54)

本期责任编辑 杨金瑞

# CHINESE JOURNAL OF CHEMICAL EDUCATION

## 2015 Vol. 36 No. 22

Sponsored by Chinese Chemical Society and Beijing Normal University

### Special Topics

- Application of Project Research Mode in Training Problem-solving Ability of Undergraduate Students ..... LI Xue-Feng HOU Ke-Ke(1)

### Investigation on Courses and Teaching Materials

- Current Situation and Countermeasure of Curriculum System Construction of Chemical Engineering in Colleges ..... YAO Wei(5)  
Practice and Reflection on Chemical General Course in Local Universities with Example of *Nice Life and Chemistry* ..... CHEN Kai CHEN Chang-Yun(9)

### Theory Teaching

- Application of Mind-mapping in University Chemistry Teaching with Chemical Equilibrium as Example ..... CHENG Chun-Ying Mhet'er Tu'erhong Abaydulla Alimjan YIN Xue-Bo(15)  
Effect of Electronic Effect on Orientation Effect and Reactivity of Mono-substituted Benzenes ..... CHENG Shao-Ling WANG Hua-Jing XIE Yun-Fu(19)  
Application of Monotonicity of Function and Derivative in Physical Chemistry Teaching ..... SHENG Wang-Qing LIAO Hua ZHU De-Mei(22)  
Application of Situational Teaching in Physical Chemistry Teaching ..... LIU Yuan TANG Bin DU Jun(25)

### Experiment Teaching

- Effect of Key Preparation Parameters on Formation of Basic Copper Carbonate ..... WU Yong-Juan ZHAO Da-Zhou FEI Fei LI Sa-Ying WANG Fu-Min LIU Zhong-Wen(28)  
Inquiry Physical Chemistry Experiment: Preparation and Performances of Graphene Membrane/Nickel Hydroxide Complex Materials ..... XU Juan CAO Jian-Yu CHEN Zhi-Dong(34)  
Experiment Teaching of Fabrication and Photovoltaic Property of Dye-sensitized Solar Cells ..... ZHOU Xiao-Yan ZHANG Ya-Ping HAN Li-Li HAO Hong-Yang(39)  
Suggestions on Teaching Reform of Analytical Chemistry Experiment ..... REN Chun-Yan MA Chuan-Li LV Hai-Tao(42)

### Teacher Education

- Courses Group Construction for Pre-service Chemistry Teacher Education ..... LIU Bao NONG Ying CHEN Yan-Yuan LUO Wei-Qiang TAO Qiang LU Hong-Qing(45)

### Vocational Education

- Teaching Content and Teaching Mode of Higher Vocational Chemistry Based on Experiment ..... FU Xi-Jun(50)

### Chemical Education for Non-Chemistry Majors

- Application of Integration of PBL and LBL Teaching Modes in Organic Chemistry Teaching for Engineering ..... FENG Xi-Lan HU Lin-Feng LI Ying(55)  
Theoretical Teaching of Blood Buffer System ..... ZHANG Qing-Fang HOU Zheng-Li HAO Yi(59)  
Information Technology and Chemistry

- Current Status and Outlook of MOOCs in Chemistry on Network Platforms ..... LEI Ying-Jie LONG Ye(62)  
Cultivation of Autonomous Learning Ability of College Students Based on Chemical Information Retrieval ..... SONG Peng-Fei WANG Rong-Min(67)

### Investigation Report

- Investigation on Students' Perception of Chemistry Laboratory Environment ..... XIN Wan-Xiang ZHOU Shi-Dong YAN Peng-Lin(70)

### Discussion and Thinking of Questions

- Using Electronic Effects to Explain Orientation Effects ..... WANG Qiang(74)

### History of Chemistry and Chemical History Education

- CAO Yuan-Yu: Important Founder of Research on Chemical History of China ..... WANG Feng-Yun PENG Yan-Mei GU Jia-Shan ZHANG Di CHEN Biao(78)

## 化 学 教 育

(半月刊·1980年创刊)

2015年 第36卷 第22期 11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》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  
电子信箱 hxjy-jce@263.net  
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  
杨振忠 郑长龙 朱玉军(专职)  
刊名题字 戴安邦  
印刷装订 河北天普润印刷厂  
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,或本刊编辑部

刊号 ISSN 1003 - 3807  
CN 11 - 1923/O6

国内邮发代号 2-106

国外发行代号 M3070

定价 12.00元