



# 化学教育 (中英文)

Chinese Journal of Chemical Education

2021年 第42卷 第7期 Vol.42 No.7



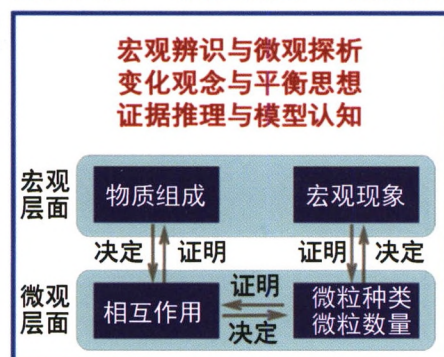
## 学科任务和问题情境

物质转化 反应调控 检验分析

### 学科认识方式

酸碱性、导电性  
反应现象  
微粒浓度  
制约关系、守恒关系  
电离、离子反应  
平衡和平衡移动  
平衡间的相互作用  
溶质、溶剂  
强、弱、非电解质

**宏观现象**  
**微粒数量**  
**微粒种类**  
**相互作用**  
**溶液组成**



### 学科能力活动

C-3 创新思维  
C-2 系统探究  
C-1 复杂推理  
B-3 简单设计  
B-2 推论预测  
B-1 分析解释  
A-3 说明论证  
A-2 概括关联  
A-1 辨识记忆

电离、离子反应、弱电解质电离平衡、  
溶液酸碱性、盐类水解、沉淀溶解平衡

### 核心知识

邮发代号: 2-106

ISSN 1003-3807



9 771003 380215 07  
HUAXUE JIAOYU



CHINESE  
CHEMICAL  
SOCIETY



主管: 中国科学技术协会  
主办: 中国化学会  
北京师范大学

### 课程·教材·评价

- 化学教材中科学本质内容表征工具的评介与应用 ..... 陈少丽 黎心瑜 陈博 张瑜 陈盈希 (1)  
人教版高中化学必修模块教科书实验活动的分析与比较——以2019年版教科书“实验”和“实验活动”栏目为例 .....  
..... 黄海清 (8)  
新版高中化学教科书视觉表征的文本研究 ..... 吴轶鹏 孙影 王磊 (15)  
人教版化学必修教材中英文教学资源的应用建议 ..... 马乐 张莹 (22)  
非物质文化遗产传承下的STEM+教育——以“国画颜料传统制作”课程开发为例 ..... 耿毅 薛勇军 王伟群 (27)

### 优质课例

- “一定溶质质量分数的氯化钠溶液的配制”项目式教学——自制洗鼻液 ..... 郭霞 (33)  
初中化学“溶解现象”项目式教学——从海带中提取碘和甘露醇 ..... 詹发云 (37)  
基于真实情境彰显学科价值——初中“化学与社会发展”复习课 ..... 周文荣 陈玲 (43)  
培养高阶思维和核心素养的高考有效复习——以“从海洋到餐桌上的碘”为例 .....  
..... 史文杰 郭玉林 李冉 田巧云 (50)

### 教学研究

- 电解质溶液主题学科核心素养的系统构成 ..... 尹博远 王磊 (56)  
从知识考古学视角看课堂中的“化学平衡” ..... 刘前树 (63)  
基于路易斯结构式的含氧酸酸性半定量判定方法：1/2规则 ..... 张诗曼 李存璞 (68)

### 调研报告

- 不同知识引出方法对科学概念结构表征的影响——来自多维标度法的证据 ..... 麦裕华 李林荣 钱扬义 (72)  
中学化学建构主义课堂环境量表的编制与应用研究 ..... 丁韞 秦春生 (79)

### 实验教学与教具研制

- 化学自救器工作原理的探究活动设计 ..... 张虹利 魏锐 田彦勤 赵雅萍 (85)  
基于证据推理的电化学综合实验探究 ..... 文洁成 黄萍 孙金凤 李炳儒 冉鸣 (90)  
初中化学教材中铁钉锈蚀实验的数字化改进 ..... 钱勤 (95)

### 问题讨论与思考

- 不同pH条件下方程式的书写规则 ..... 王琳 陈晓峰 方敏 包建春 苏志 吴勇 (100)  
去除粗盐可溶性杂质必须第一步去除硫酸根离子——从盐效应角度分析实验步骤 ..... 曹葵 李燕 杨晓玲 (104)

### 化学史与化学史教育

- “蛙腿论战”化学史及其教学价值的探析 ..... 单媛媛 郑长龙 (108)

### 论文简报

- 基于化学学科核心素养的初高中贯通教学研究——以“化学键”为例 ..... 肖路 (32)  
中学化学教学中的证据推理 ..... 吴军 (55)  
“四问”驱动化学问题解决的途径及案例 ..... 陈爱民 (78)  
父母对高中生STEM职业倾向的影响 ..... 胡源龙 李佳 孙旭 (99)  
醋酸亚铬晶体制备中的反应原理 ..... 姚远 石小倩 杨旭东 (113)

2021年《化学教育》订阅通知 ..... (7)

封面图片 ..... (61)

本期责任编辑 陈会玲 张霄青

**Curriculum-Teaching Materials-Assessment**

- Review and Application of Representations Tools of Nature of Science Content in Chemistry Textbooks ..... CHEN Shao-Li LI Xin-Yu CHEN Bo ZHANG Yu CHEN Ying-Xi(1)
- Analysis and Comparison of Laboratory Activities in Senior High School Chemistry Textbooks Published by People's Education Press; Taking "Experiment" and "Experimental Activity" Columns of the 2019 Textbooks for Example ..... HUANG Hai-Qing(8)
- Text Study on Visual Representation in New Senior High School Chemistry Textbooks ..... WU Yi-Peng SUN Ying WANG Lei(15)
- Analysis and Application Suggestions of English Teaching Resources in Chemistry Compulsory Textbooks Published by People's Education Press ..... MA Le ZHANG Ying(22)
- STEM+ Education Under the Inheritance of Intangible Cultural Heritage: Course Development of Traditional Chinese Painting Pigment Production ..... GENG Yi XUE Yong-Jun WANG Wei-Qun(27)

**Excellent Lesson**

- Project Teaching of Preparation of Sodium Chloride Solution with Certain Solute Mass Fraction; Self-Made Nasal Wash ..... GUO Xia(33)
- Project Teaching of "Dissolution Phenomenon" in Junior High School Chemistry; Extraction of Iodine and Mannitol from Kelp ..... ZHAN Fa-Yun(37)
- Highlight Subject Value Based on Real Situation; Review Lesson of "Chemistry and Social Development" ..... ZHOU Wen-Rong CHEN Ling(43)
- Review Lesson for College Entrance Examination to Cultivate High Level Thinking and Core Literacy; Iodine from Ocean to Table ..... SHI Wen-Jie GUO Yu-Lin LI Ran TIAN Qiao-Yun(50)

**Teaching Research**

- Systematic Composition of Discipline Core Literacy of Electrolyte Solution ..... YIN Bo-Yuan WANG Lei(56)
- Chemical Equilibrium in Classroom; From Perspective of Knowledge Archaeology ..... LIU Qian-Shu(63)
- 1/2 Rule; Semi Quantitative Determination Method for Acidity of Oxyacid Based on Lewis Structural Formula ..... ZHANG Shi-Man LI Cun-Pu(68)

**Investigation Report**

- Effect of Different Methods of Knowledge Elicitation to Representation of Science Conceptual Structure; Evidence from Multidimensional Scaling ..... MAI Yu-Hua LI Lin-Shen QIAN Yang-Yi(72)
- Development and Application of Constructivism Classroom Environment Scale of High School Chemistry ..... DING Yun QIN Chun-Sheng(79)

**Experiment Teaching and Teaching Aid Development**

- Inquiry Activity Design of Operating Principle for Chemical Oxygen Self-Rescuer ..... ZHANG Hong-Li WEI Rui TIAN Yan-Qin ZHAO Ya-Ping(85)
- Electrochemical Comprehensive Experiment Inquiry Based on Evidence Reasoning ..... WEN Jie-Cheng HUANG Ping SUN Jin-Feng LI Bing-Ru RAN Ming(90)
- Digital Improvement of Nail Corrosion Experiment in Junior High School Chemistry Textbook ..... QIAN Qin(95)

**Discussion and Thinking of Questions**

- Writing Rules of Equations Under Different pH Conditions ..... WANG Lin CHEN Xiao-Feng FANG Min BAO Jian-Chun SU Zhi WU Yong(100)
- Sulfate Ion Must be Removed in the First Step to Remove Soluble Impurities in Crude Salt; Analysis From Salt Effect Perspective ..... CAO Kui LI Yan YANG Xiao-Ling(104)

**History of Chemistry and Chemical History Education**

- Analysis of Chemistry History of "Frog Leg Debate" and Its Teaching Value ... SHAN Yuan-Yuan ZHENG Chang-Long(108)

**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)

2021年 第42卷 第7期 4月2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.chemsoc.org.cn

顾问 刘知新  
 主编 刘正平  
 副主编 姜雪峰 施展 孙世刚 王磊  
 王祖浩 杨屹 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

**Curriculum-Teaching Materials-Assessment**

- Review and Application of Representations Tools of Nature of Science Content in Chemistry Textbooks ..... CHEN Shao-Li LI Xin-Yu CHEN Bo ZHANG Yu CHEN Ying-Xi(1)
- Analysis and Comparison of Laboratory Activities in Senior High School Chemistry Textbooks Published by People's Education Press; Taking "Experiment" and "Experimental Activity" Columns of the 2019 Textbooks for Example ..... HUANG Hai-Qing(8)
- Text Study on Visual Representation in New Senior High School Chemistry Textbooks ..... WU Yi-Peng SUN Ying WANG Lei(15)
- Analysis and Application Suggestions of English Teaching Resources in Chemistry Compulsory Textbooks Published by People's Education Press ..... MA Le ZHANG Ying(22)
- STEM+ Education Under the Inheritance of Intangible Cultural Heritage: Course Development of Traditional Chinese Painting Pigment Production ..... GENG Yi XUE Yong-Jun WANG Wei-Qun(27)

**Excellent Lesson**

- Project Teaching of Preparation of Sodium Chloride Solution with Certain Solute Mass Fraction; Self-Made Nasal Wash ..... GUO Xia(33)
- Project Teaching of "Dissolution Phenomenon" in Junior High School Chemistry: Extraction of Iodine and Mannitol from Kelp ..... ZHAN Fa-Yun(37)
- Highlight Subject Value Based on Real Situation; Review Lesson of "Chemistry and Social Development" ..... ZHOU Wen-Rong CHEN Ling(43)
- Review Lesson for College Entrance Examination to Cultivate High Level Thinking and Core Literacy: Iodine from Ocean to Table ..... SHI Wen-Jie GUO Yu-Lin LI Ran TIAN Qiao-Yun(50)

**Teaching Research**

- Systematic Composition of Discipline Core Literacy of Electrolyte Solution ..... YIN Bo-Yuan WANG Lei(56)
- Chemical Equilibrium in Classroom; From Perspective of Knowledge Archaeology ..... LIU Qian-Shu(63)
- 1/2 Rule; Semi Quantitative Determination Method for Acidity of Oxyacid Based on Lewis Structural Formula ..... ZHANG Shi-Man LI Cun-Pu(68)

**Investigation Report**

- Effect of Different Methods of Knowledge Elicitation to Representation of Science Conceptual Structure; Evidence from Multidimensional Scaling ..... MAI Yu-Hua LI Lin-Shen QIAN Yang-Yi(72)
- Development and Application of Constructivism Classroom Environment Scale of High School Chemistry ..... DING Yun QIN Chun-Sheng(79)

**Experiment Teaching and Teaching Aid Development**

- Inquiry Activity Design of Operating Principle for Chemical Oxygen Self-Rescuer ..... ZHANG Hong-Li WEI Rui TIAN Yan-Qin ZHAO Ya-Ping(85)
- Electrochemical Comprehensive Experiment Inquiry Based on Evidence Reasoning ..... WEN Jie-Cheng HUANG Ping SUN Jin-Feng LI Bing-Ru RAN Ming(90)
- Digital Improvement of Nail Corrosion Experiment in Junior High School Chemistry Textbook ..... QIAN Qin(95)

**Discussion and Thinking of Questions**

- Writing Rules of Equations Under Different pH Conditions ..... WANG Lin CHEN Xiao-Feng FANG Min BAO Jian-Chun SU Zhi WU Yong(100)
- Sulfate Ion Must be Removed in the First Step to Remove Soluble Impurities in Crude Salt; Analysis From Salt Effect Perspective ..... CAO Kui LI Yan YANG Xiao-Ling(104)

**History of Chemistry and Chemical History Education**

- Analysis of Chemistry History of "Frog Leg Debate" and Its Teaching Value ... SHAN Yuan-Yuan ZHENG Chang-Long(108)

**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)

2021年 第42卷 第7期 4月2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.chemsoc.org.cn

顾问 刘知新  
 主编 刘正平  
 副主编 姜雪峰 施展 孙世刚 王磊  
 王祖浩 杨屹 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