



中国科技核心期刊  
RCCSE中国核心学术期刊(A)  
湖北省优秀期刊  
中国高校优秀科技期刊

ISSN 1000-2375  
CN 42-1212/N

# 湖北大学 **学报**

## 自然科学版

JOURNAL OF HUBEI UNIVERSITY  
NATURAL SCIENCE

# 3

## 2022

第44卷 第3期  
Vol. 44 No. 3

网格空间负荷预测方法研究专栏

基于 POI 信息挖掘的网格空间负荷预测方法 ..... 黄竞择,侯婷婷,雷何,刘一鸣,徐菁,李妍(245)

Grid-based spatial load forecasting method based on POI information mining

..... HUANG Jingze, HOU Tingting, LEI He, LIU Yiming, XU Jing, LI Yan

城市负荷空间分布的聚类感知方法 ..... 刘俊勇,徐琛,海家鸣,杨珏,宋珂,张淦,李妍(252)

Cluster sensing method in urban load spatial distribution

..... LIU Junyong, XU Chen, HAI Jiaming, YANG Jue, SONG Ke, ZHANG Gan, LI Yan

磁性微粒的制备及萃取应用专栏

对氨基苯酚印迹聚合物磁微粒制备及其萃取应用 ..... 褚琪琪,王筱倩,党雪平,陈怀侠(258)

Preparation and application of p-aminophenol imprinted polymer magnetic particles for extraction

..... CHU Qiqi, WANG Xiaoqian, DANG Xueping, CHEN Huaixia

磁性 MIL-100(Fe) 微粒制备及其萃取应用 ..... 吴官永,王筱倩,党雪平,陈怀侠(265)

Preparation and application of Fe<sub>3</sub>O<sub>4</sub>@MIL-100(Fe) microspheres in extraction

..... WU Guanyong, WANG Xiaoqian, DANG Xueping, CHEN Huaixia

石墨烯复合材料制备与应用研究专栏

羟基磷灰石/氧化石墨烯(HAP/GO)的可控合成及其用于布洛芬的缓释

..... 宋芊,高海清,王应席,李玲(270)

Controllable synthesis of hydroxyapatite/graphene oxide (HAP/GO) and its application in the sustained release of ibuprofen

..... SONG Qian, GAO Haiqing, WANG Yingxi, LI Ling

石墨烯/CoSnO<sub>3</sub> 固载 Pd-Pb 纳米合金的制备及电催化氧化乙二醇

..... 吴祉睿,马奇,王敏,莫晗,钟玉婷,刘红英,周立群(277)

Synthesis and electrocatalytic oxidation of ethylene glycol on Pd-Pb nanoalloys immobilized on graphene/CoSnO<sub>3</sub> composites

..... WU Zhirui, MA Qi, WANG Min, MO Han, ZHONG Yuting, LIU Hongying, ZHOU Liquan

## 植物生长与环境响应研究专栏

几种植物生长调节剂组合对亚热带山地泥炭藓 (*Sphagnum palustre* L.) 生长影响的初步研究  
 ..... 张文娟,汪正祥,邓龙强,刘韬,李亭亭(287)

Growth response of *Sphagnum palustre* L. to category and concentration of plant growth regulators in  
 subtropical mountains  
 ..... ZHANG Wenjuan, WANG Zhengxiang, DENG Longqiang, LIU Tao, LI Tingting

喜旱莲子草入侵与湖岸带环境的耦联分析——以城市湖泊武汉沙湖为例  
 ..... 郭佳琦,赵丽娅,周宇,李兆华(298)

Coupling analysis between the invasion of *Alternanthera philoxeroides* and lakeshore environment factors:  
 take the Shahu Lake in Wuhan as an instance ..... GUO Jiaqi, ZHAO Liya, ZHOU Yu, LI Zhaohua

## 基础数学与应用数学

奇长度的  $4^q$ -QAM 互补序列集 ..... 丁小茂,周亚晶,罗荣(306)

$4^q$ -QAM complementary sequence sets with odd length ..... DING Xiaomao, ZHOU Yajing, LUO Rong

高维解析 Jacobi 算子的 Lyapunov 指数的 log-Hölder 连续性 ..... 尤安迪,陶凯(312)

The log-Hölder continuity of the Lyapunov exponent of high dimension analytic Jacobi operator  
 ..... YOU Andi, TAO Kai

一类平面数字限制集的维数 ..... 董家梅,席玉佩(320)

The dimensions of a class of sets defined by digit restrictions on plane ..... DONG Jiamei, XI Yupei

基于 DEA-Malmquist 模型的甘肃省科技创新效率研究 ..... 达虎,范瑞龙,张国淋,费振华,柳亭(325)

The efficiency of scientific and technological innovation in Gansu Province based on DEA-Malmquist model  
 ..... DA Hu, FAN Ruilong, ZHANG Yuanlin, FEI Zhenghua, LIU Ting

## 物理学与电子技术

基于 HUST-Ship 的船舶自航仿真流场特性分析 ..... 操戈,刘李为,冯大奎,张志国,王先洲(333)

# CONTENTS

Journal of Hubei University  
Natural Science

- Study for numerical simulation of ship flow field characteristics under self-propulsion based on HUST-Ship  
..... CAO Ge, LIU Liwei, FENG Dakui, ZHANG Zhiguo, WANG Xianzhou
- 基于遗传算法的分数阶锂电池模型参数辨识 ..... 吴俊, 杨维明, 姚静, 黄秋安 (339)
- Parameter identification of fractional lithium battery model based on genetic algorithm  
..... WU Jun, YANG Weiming, YAO Jing, HUANG Qiu'an
- 锑烯量子点对脉冲激光的非线性饱和吸收  
..... 董博, 薛为远, 毛彩霞, 陈志远, 薛丽, 胡永红, 熊钢, 李干明 (345)
- Nonlinear saturable absorption in antimonene quantum dots for pulsed laser  
..... DONG Bo, XUE Weiyuan, MAO Caixia, CHEN Zhiyuan,  
XUE Li, HU Yonghong, XIONG Gang, LI Ganming

## 地理学与环境科学

- 基于耦合协调模型的长江经济带经济与土地生态质量关系研究 ..... 韩晨晓, 陈艳红, 崔世华, 于婧 (352)
- Study on the relationship between economy and land ecological quality in the Yangtze River Economic Belt  
based on coupling coordination model ..... HAN Chenxiao, CHEN Yanhong, CUI Shihua, YU Jing

## 生命科学与医药卫生

- 复配多肽对强酸性土壤条件下“云烟 87”的根系生长调控  
..... 吴红红, 刘紫薇, 李偲, 杨升, 冯吉, 李建平, 孙光伟, 孙敬国, 陈振国, 李亚东 (361)
- Regulation of root growth of “Yunyan 87” in highly acidic soil by compound polypeptide  
..... WU Honghong, LIU Ziwei, LI Si, YANG Sheng, FENG Ji, LI Jianping,  
SUN Guangwei, SUN Jingguo, CHEN Zhenguo, LI Yadong

## 化学化工与材料科学

- 一种苯并噻吩双膦的合成与表征 ..... 杨柳, 龚斐斐, 熊能, 徐伟, 王子昂, 柳利 (368)
- Synthesis and characterization of benzothiophenyl diphosphines  
..... YANG Liu, GONG Feifei, XIONG Neng, XU Wei, WANG Ziang, LIU Li



微信公众号

# 湖北大学学报 自然科学版

HUBEI DAXUE XUEBAO ZIRAN KEXUE BAN

1975年创刊 双月刊 公开发行

主管单位 湖北省教育厅  
 主办单位 湖北大学  
 编辑出版 湖北大学学报编辑部 (武汉市武昌区友谊大道368号)  
 邮政编码: 430062 电话: 86-027-88663900  
<http://xb.hubu.edu.cn>

主 编 王世敏  
 常务副主编 郭康松  
 副 主 编 游 俊  
 印刷装订 武汉市宏达盛印务有限公司  
 国内发行 湖北省邮政局  
 国外发行 中国国际图书贸易集团有限公司  
 (北京399信箱 邮政编码: 100044)

Supervisor Hubei Provincial Department of Education, China  
 Sponsor Hubei University, China  
 Edited and Published by Editorial Department of  
 the Journal of Hubei University  
 ( 368 Youyi Avenue, Wuchang, Wuhan 430062, China )  
 Tel:86-027-88663900  
<http://xb.hubu.edu.cn>

Editor-in-Chief WANG Shimin  
 Managing Deputy Editor-in-Chief GUO Kangsong  
 Deputy Editor-in-Chief YOU Jun  
 Distributed by China International Book Trading Corporation  
 ( P. O. Box 399, Beijing, 100044, China )

刊 号: ISSN 1000-2375  
 邮发代号: 国内38-45  
 国外Q5777

CN 42-1212/N  
 国内定价: 15.00元/期  
 90.00元/年

