



www.whxb.pku.edu.cn



QK1814415

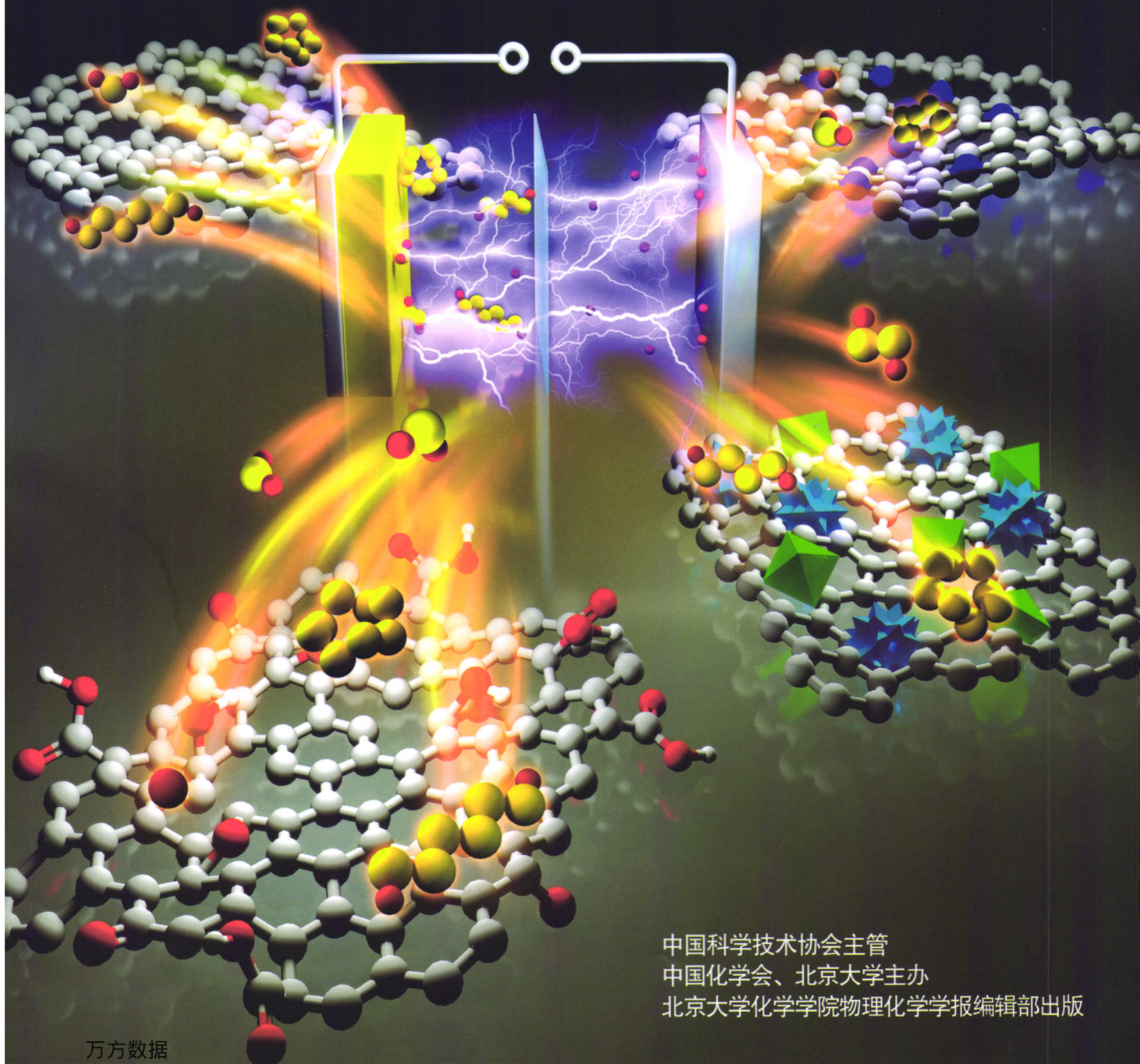


ISSN 1000-6818
CN 11-1892/O6
CODEN WHXUEU

物理化学学报

ACTA PHYSICO-CHIMICA SINICA

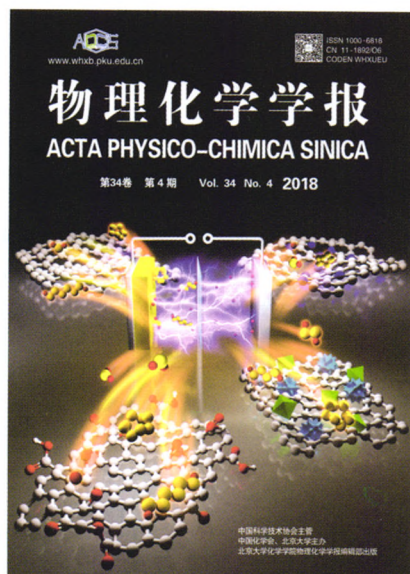
第34卷 第4期 Vol. 34 No. 4 2018



中国科学技术协会主管
中国化学会、北京大学主办
北京大学化学学院物理化学学报编辑部出版

万方数据

COVER



The cover image presents the application of graphene-based materials with various structures for Li-S batteries. On page 377, CHEN *et al.* summarize the recent progress of graphene-based materials used in Li-S batteries and discuss perspectives regarding the development potential of graphene-based materials for Li-S batteries, including functionalized graphene, heteroatom-doped graphene, and graphene-based hybrids.

CONTENTS

亮点 HIGHLIGHT

- 三元超细Pt-Mo-Ni纳米线的设计合成及其电催化乙醇氧化性能(Design of Ultrathin Pt-Mo-Ni Nanowire Catalysts for Ethanol Electrooxidation)..... 刘忠范(LIU Zhongfan) (323)
- 离子液体为溶剂和模板剂合成多级孔金属催化材料(Synthesis of Hierarchical Porous Metals Using Ionic-Liquid-Based Media as Solvent and Template)..... 刘会贞(LIU Huizhen) (325)
- 功能化离子液体吸收活化二氧化碳制取甲酸(Absorption and Activation of Carbon Dioxide by Functionalized Ionic Liquid for the Preparation of Formic Acid)..... 韩布兴(HAN Buxing) (327)
- ^{17}O 固体核磁共振谱学区分不同晶面取向的氧化物纳米晶(Distinguishing Faceted Oxide Nanocrystals with ^{17}O Solid-State Nuclear Magnetic Resonance Spectroscopy)..... 侯文华(HOU Wenhua) (329)
- 石榴石氧化物化学修饰增强聚偏氟乙烯基固态电解质(Synergistic Coupling between $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$ and Poly(vinylidene fluoride) Induces High Performance of Solid Composite Electrolytes)..... 谷林(GU Lin) (331)

当期推荐 RECOMMENDATION

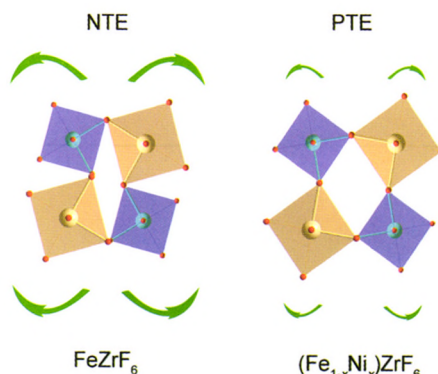
- 基于卟啉的新型近红外非富勒烯电子受体分子(Constructing Near-Infrared Non-Fullerene Electron Acceptors Based on Porphyrin)..... 刘忠范(LIU Zhongfan) (333)
- Au/TiO₂/MoS₂ 等离子体复合光催化剂的制备及其增强光催化产氢活性(Preparation of Au/TiO₂/MoS₂ Plasmonic Composite Photocatalysts with Enhanced Photocatalytic Hydrogen Generation Activity)..... 刘忠范(LIU Zhongfan) (335)
- 染料敏化太阳能电池中染料的激发态超快动力学(Ultrafast Excited-State Dynamics of Organic Sensitizers in DSCs)..... 刘忠范(LIU Zhongfan) (337)

$(\text{Fe}_{1-x}\text{Ni}_x)\text{ZrF}_6$ 固溶体晶体结构与可调控的热膨胀性质

许家乐, 胡磊, 王璐, 邓金侠, 陈骏, 邢献然

Controllable Thermal Expansion and Crystal Structure of $(\text{Fe}_{1-x}\text{Ni}_x)\text{ZrF}_6$ Solid Solutions

XU Jiale, HU Lei, WANG Lu, DENG Jinxia, CHEN Jun, XING Xianran



A controllable thermal expansion of $(\text{Fe}_{1-x}\text{Ni}_x)\text{ZrF}_6$ could be achieved by the chemical substitution of Ni^{2+} for Fe^{2+} over a wide range of the coefficient of thermal expansion (CTE).

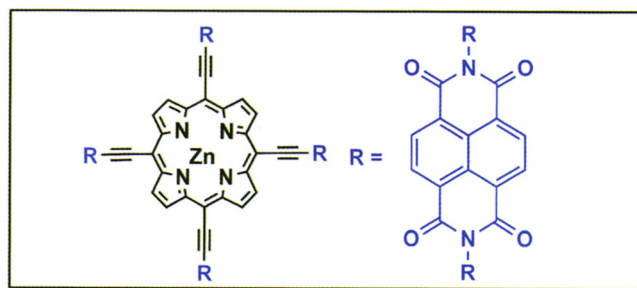
Acta Phys. -Chim. Sin. **2018**, *34* (4), 339–343

萘酰亚胺-卟啉星型电子受体分子的构筑及其在非富勒烯太阳能电池中的应用

周士超, 冯贵涛, 夏冬冬, 李诚, 武永刚, 李伟伟

Star-Shaped Electron Acceptor based on Naphthalenediimide-Porphyrin for Non-Fullerene Organic Solar Cells

ZHOU Shichao, FENG Guitao, XIA Dongdong, LI Cheng, WU Yonggang, LI Weiwei



A star-shaped electron acceptor based on porphyrin as the core and naphthalenediimide as the end groups was developed for non-fullerene solar cells, in which a power conversion efficiency of 1.8% was achieved with a broad photo-response from 300 nm to 900 nm.

Acta Phys. -Chim. Sin. **2018**, *34* (4), 344–347

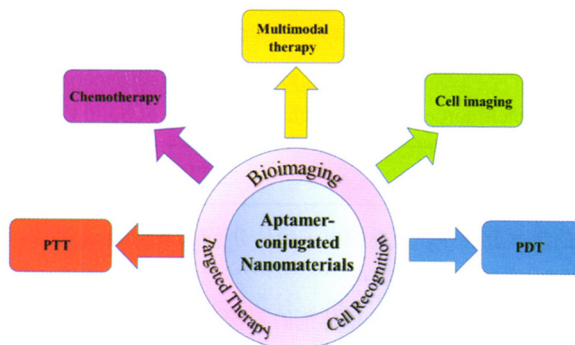
综述 REVIEW

核酸适体-纳米材料复合物用于癌症的诊断与靶向治疗研究进展

白华荣, 范换换, 张晓兵, 陈卓, 谭蔚泓

Aptamer-Conjugated Nanomaterials for Specific Cancer Diagnosis and Targeted Therapy

BAI Huarong, FAN Huanhuan, ZHANG Xiaobing, CHEN Zhuo, TAN Weihong

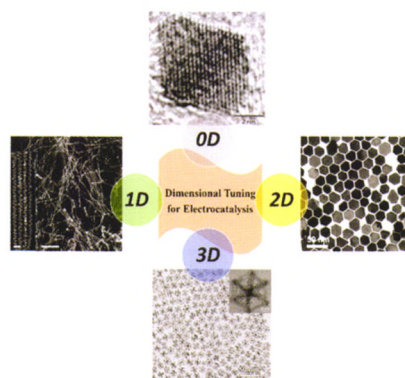


Aptamer-conjugated nanomaterials that have been used as nanocarriers for specific cancer cell diagnosis and targeted therapy have been summarized.

Acta Phys. -Chim. Sin. **2018**, *34* (4), 348–360

维度调控策略提升铂基纳米晶氧还原催化研究进展

骆明川, 孙英俊, 秦英楠, 杨勇, 吴冬, 郭少军



Boosting Oxygen Reduction Catalysis by Tuning the Dimensionality of Pt-based Nanostructures

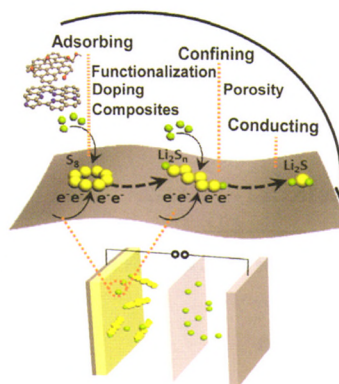
LUO Mingchuan, SUN Yingjun, QIN Yingnan, YANG Yong, WU Dong, GUO Shaojun

Tuning the dimensionalities of Pt-based nanocrystals represents an effective strategy for improving their electrocatalytic activity in the oxygen reduction reaction, thus leading to a substantial decrease in the required loading of the Pt-based catalyst in renewable energy technologies.

Acta Phys. -Chim. Sin. **2018**, *34* (4), 361–376

锂硫电池用石墨烯基材料的研究进展

陈克, 孙振华, 方若翮, 李峰, 成会明



Development of Graphene-based Materials for Lithium-Sulfur Batteries

CHEN Ke, SUN Zhenhua, FANG Ruopian, LI Feng, CHENG Huiming

The development of graphene-based materials with different structural characteristics for high-performance lithium-sulfur batteries has been reviewed.

Acta Phys. -Chim. Sin. **2018**, *34* (4), 377–390

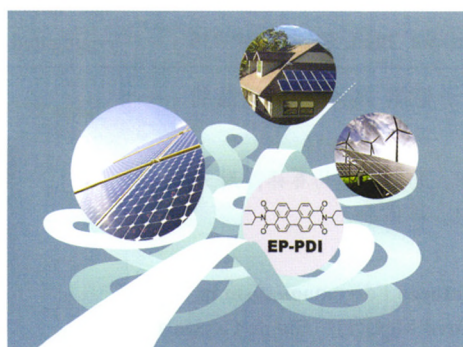
专论 FEATURE ARTICLE

基于茈二酰亚胺类非富勒烯受体共混体系凝聚态结构调控

韩杰, 梁秋菊, 曲轶, 刘剑刚, 韩艳春

Morphology Control of Non-fullerene Blend Systems Based on Perylene Diimide Acceptors

HAN Jie, LIANG Qiuju, QU Yi, LIU Jiangan, HAN Yanchun

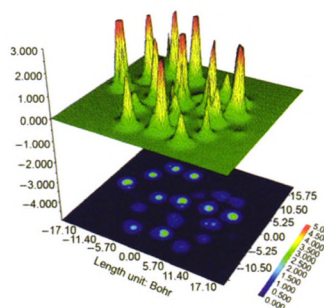


The principles of morphology control of PDI blend systems have been identified to reveal the impact of morphology on the performance of PDI-based non-fullerene solar cells.

Acta Phys. -Chim. Sin. **2018**, *34* (4), 391–406

Which Information Theoretic Quantity Should We Choose for Steric Analysis of Water Nanoclusters (H₂O)_n (n = 6, 32, 64)?

ALIPOUR Mojtaba



In this work, the applicability and accountability of information theory functionals as measures of steric effects have been evaluated for the steric analysis of water nanoclusters.

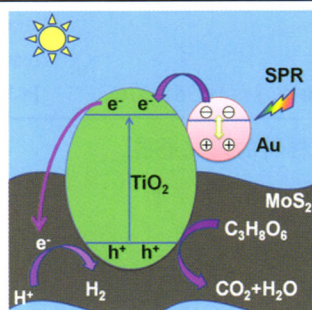
Acta Phys. -Chim. Sin. **2018**, 34 (4), 407–413

Au/TiO₂/MoS₂ 等离子体复合光催化剂的制备及其增强光催化产氢活性

杜新华, 李阳, 殷辉, 向全军

Preparation of Au/TiO₂/MoS₂ Plasmonic Composite Photocatalysts with Enhanced Photocatalytic Hydrogen Generation Activity

DU Xinhua, LI Yang, YIN Hui, XIANG Quanjun



The Au/TiO₂/MoS₂ plasmonic composites show enhanced photocatalytic hydrogen generation activity.

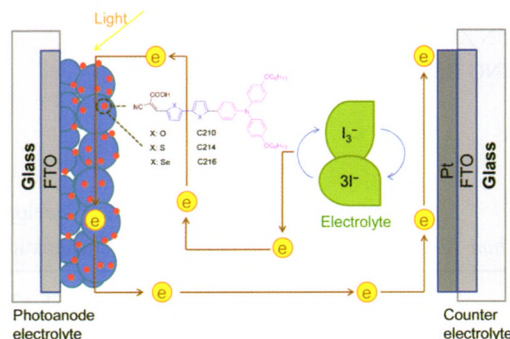
Acta Phys. -Chim. Sin. **2018**, 34 (4), 414–423

含不同杂原子共轭单元的有机光敏染料的超快发光动力学

刘娇, 霍继存, 张敏, 董献堆

Ultrafast Photoluminescence Dynamics of Organic Photosensitizers with Conjugated Linkers Containing Different Heteroatoms

LIU Jiao, HUO Jicun, ZHANG Min, DONG Xiandui



The ultrafast photoluminescence of three organic DSC dyes with various conjugated linkers are studied.

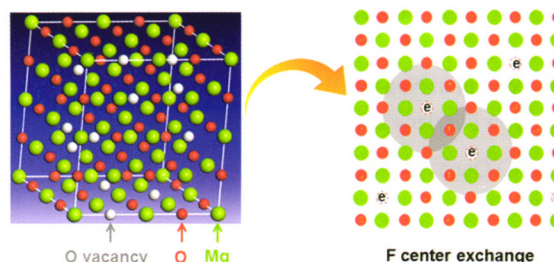
Acta Phys. -Chim. Sin. **2018**, 34 (4), 424–436

点缺陷引起中子辐照 MgO(110)单晶的铁磁性

曹梦雄, 王兴宇, 马亚茹, 马春林, 周卫平, 王晓雄, 王海欧, 谭伟石

Point Defects Induced Ferromagnetism in Neutron Irradiated MgO(110) Single Crystals

CAO Mengxiong, WANG Xingyu, MA Yaru, MA Chunlin, ZHOU Weiping, WANG Xiaoxiong, WANG Haiou, TAN Weishi



Neutron irradiation-induced O vacancy defects can contribute to the intrinsic d^0 ferromagnetism in MgO(110) single crystals.

Acta Phys. -Chim. Sin. **2018**, 34 (4), 437–444

《物理化学学报》编辑委员会

The Editorial Committee of Acta Physico-Chimica Sinica

名誉主编(Honorary Editor-in-Chief)

唐有祺 TANG Youqi

顾问编委(Advisory Board Member)

包信和 BAO Xinhe	黄维 HUANG Wei	万立骏 WAN Lijun	杨伟涛 YANG Weitao
段雪 DUAN Xue	LIEBER Charles M.	吴云东 WU Yundong	姚建年 YAO Jiannian
付贤智 FU Xianzhi	田中群 TIAN Zhongqun	谢晓亮 XIE Xiaoliang	赵新生 ZHAO Xinsheng
侯建国 HOU Jianguo			

主 编(Editor-in-Chief)

刘忠范 LIU Zhongfan

副主编(Associate Editor-in-Chief)

韩布兴 HAN Buxing	申文杰 SHEN Wenjie	杨金龙 YANG Jinlong	迟力峰 CHI Lifeng
刘鸣华 LIU Minghua	吴凯 WU Kai	庄林 ZHUANG Lin	

编 委(Editorial Board Member)

曹勇 CAO Yong	侯文华 HOU Wenhua	马晶 MA Jing	吴鹏 WU Peng
陈经广 CHEN Jingguang	金荣超 JIN Rongchao	孟庆波 MENG Qingbo	夏永姚 XIA Yongyao
陈军 CHEN Jun	来鲁华 LAI Luhua	邵翔 SHAO Xiang	许国勤 XU Guoqin
崔屹 CUI Yi	李朝军 LI Chaojun	孙俊奇 SUN Junqi	杨俊林 YANG Junlin
邓风 DENG Feng	李隽 LI Jun	谭蔚泓 TAN Weihong	余家国 YU Jianguo
邓友全 DENG Youquan	李象远 LI Xiangyuan	唐智勇 TANG Zhiyong	尉志武 YU Zhiwu
樊卫斌 FAN Weibin	梁万珍 LIANG Wanzhen	王键吉 WANG Jianji	占肖卫 ZHAN Xiaowei
房喻 FANG Yu	刘海超 LIU Haichao	王鹏 WANG Peng	张东辉 ZHANG Donghui
付红兵 FU Hongbing	刘洪来 LIU Honglai	王心晨 WANG Xincheng	张浩力 ZHANG Haoli
傅强 FU Qiang	刘述斌 LIU Shubin	王永锋 WANG Yongfeng	张锦 ZHANG Jin
高毅勤 GAO Yiqin	刘义 LIU Yi	魏子栋 WEI Zidong	章俊良 ZHANG Junliang
郭林 GUO Lin	刘志敏 LIU Zhimin	翁羽翔 WENG Yuxiang	周永贵 ZHOU Yonggui
郝京诚 HAO Jingcheng	罗小民 LUO Xiaomin		

编辑部成员(Editorial Staff)

张小娟(主任) ZHANG Xiaojuan (Director)
欧阳贱华 OUYANG Jianhua 熊英 XIONG Ying 於秀芝 YU Xiuzhi 周虹 ZHOU Hong

物理化学学报(WULI HUAXUE XUEBAO)第34卷第4期 (2018.04.15)

ACTA PHYSICO-CHIMICA SINICA, Vol.34, No.4 (April 15, 2018)

月刊(1985年创刊)

Monthly (First volume appeared in 1985)

编辑出版者	北京大学化学与分子工程学院 《物理化学学报》编辑部	Editor and Publisher:	Editorial Office of Acta Physico-Chimica Sinica (Wuli Huaxue Xuebao)
地 址	北京大学化学楼(邮政编码 100871)	Address:	Chemistry Building Peking University Beijing 100871, P. R. China
电 话	+86-10-62751724, +86-10-62756388	Tel.:	+86-10-62751724, +86-10-62756388
主 编	刘忠范	Editor-in-Chief:	LIU Zhongfan
主管单位	中国科学技术协会	Printer:	Beijing Kexin Printing CO., LTD
印刷者	北京科信印刷有限公司	Distributor:	China International Book Trading Corporation (Code No 1443-MO)
国内总发行	北京报刊发行局	Website:	http://www.whxb.pku.edu.cn
国内订购	全国各邮局		
国外发行	中国国际图书贸易总公司 Code No 1443-MO		
Email:	whxb@pku.edu.cn		

定价: 50.00 元

2018年4月15日出版

国内邮发代号: 82-163

