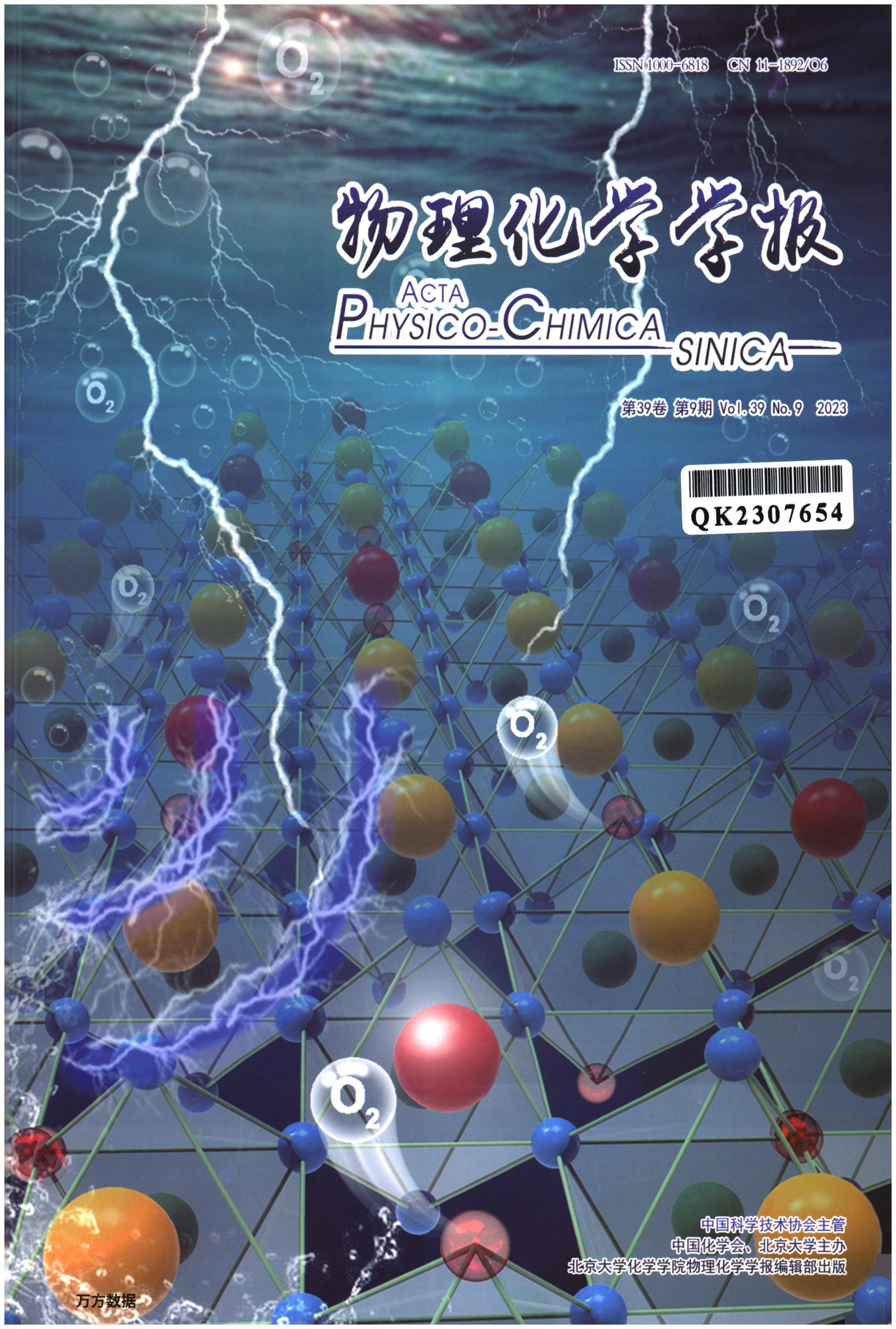
ISSN 1000-6818 CN 11-1892/O6

物理化学学报

ACTA PHYSICO-CHIMICA SINICA

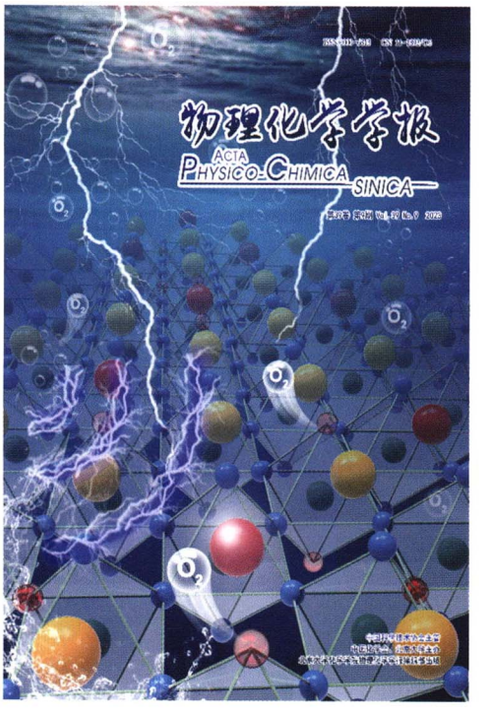
第39卷 第9期 Vol. 39 No. 9 2023



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

物 理 化 学 学 报 第 39 卷 第 9 期
ACTA PHYSICO-CHIMICA SINICA, Vol. 39, No. 9

COVER



The cover image presents the introduction of strontium to optimize the structure of two-dimensional (2D) porous $LaCoO_3$ perovskite for electrocatalytic oxygen evolution applications. In article No. 2212025, Wan and Yao *et al.* demonstrate a microwave shock strategy to synthesize 2D porous $La_{0.2}Sr_{0.8}CoO_3$ for investigating the mechanism behind the effect of oxygen-rich defects on catalytic activity.

CONTENTS

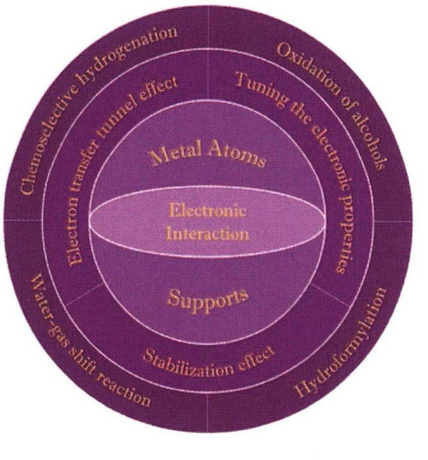
亮点 RESEARCH HIGHLIGHT

层间化学键合促进二维层状共价有机框架光催化析氢
(Boosting Photocatalytic Hydrogen Evolution by Interlayer Chemical Bonding in 2D Layered Covalent Organic Frameworks)
…… 李世杰，陈晓波，袁玉鹏 (Shijie Li, Xiaobo Chen, Yupeng Yuan) (2303032)

综述 REVIEW

单原子催化剂电子结构调控实现高效多相催化
罗耀武，王定胜

Enhancing Heterogeneous Catalysis by Electronic Property Regulation of Single Atom Catalysts
Yaowu Luo, Dingsheng Wang

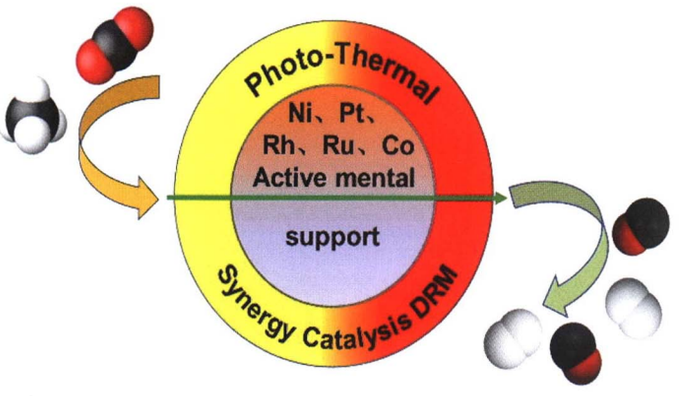


Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212020
doi: 10.3866/PKU.WHXB202212020

The insight into electronic metal-support interaction aids the understanding of catalytic mechanisms and the rational design of heterogeneous catalysts.

光热催化甲烷干重整研究进展

何展军，黄敏，林铁军，钟良枢



Recent Advances in Dry Reforming of Methane *via* Photothermocatalysis

Zhanjun He, Min Huang, Tiejun Lin, Liangshu Zhong

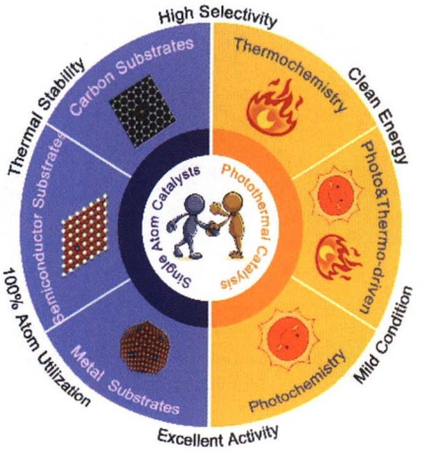
Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212060

doi: 10.3866/PKU.WHXB202212060

Recent research progress in photothermocatalysis of dry reforming of methane is briefly summarized, and future challenges and new perspectives on the photothermocatalysis of the dry reforming of methane are highlighted.

基于单原子催化剂的光热催化转化：原理和应用

宋千伟，何观朝，费慧龙



Photothermal Catalytic Conversion Based on Single Atom Catalysts: Fundamentals and Applications

Qianwei Song, Guanchao He, Huilong Fei

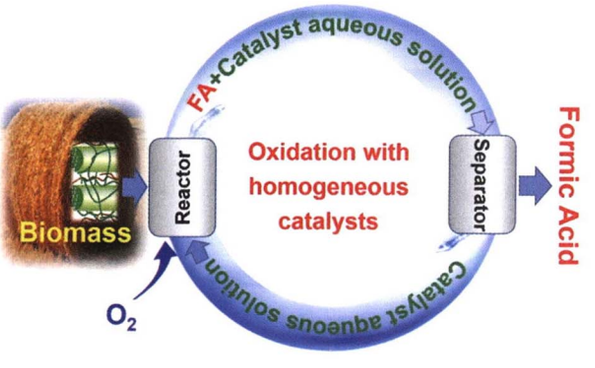
Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212038

doi: 10.3866/PKU.WHXB202212038

This review summarizes the advantages and applications of photothermal catalysis driven by solar energy based on single-atom catalysts.

均相催化剂催化氧气氧化生物质制备甲酸

侯玉翠，何卓森，任树行，吴卫泽



Catalytic Oxidation of Biomass to Formic Acid under O_2 with Homogeneous Catalysts

Yucui Hou, Zhuosen He, Shuhang Ren, Weize Wu

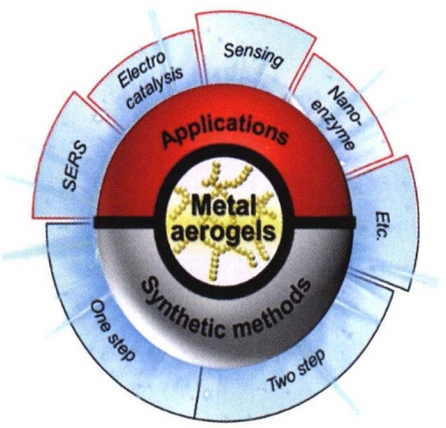
Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212065

doi: 10.3866/PKU.WHXB202212065

Biomass is oxidized by O_2 to formic acid *via* homogeneous catalysis, and CO_2 formation is inhibited by the addition of alcohols.

金属气凝胶：可控制备与应用展望

王宁，李一，崔乾，孙晓玥，胡悦，罗运军，杜然



Metal Aerogels: Controlled Synthesis and Applications

Ning Wang, Yi Li, Qian Cui, Xiaoyue Sun, Yue Hu, Yunjun Luo, Ran Du

Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212014

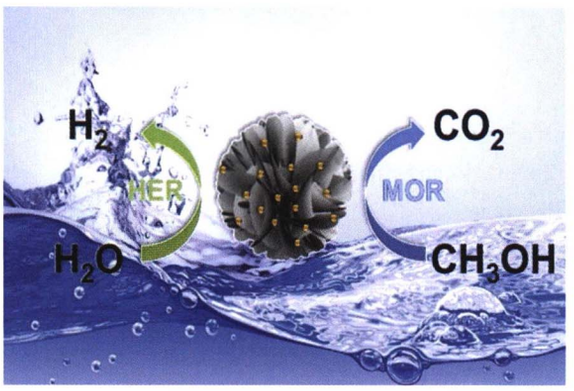
doi: 10.3866/PKU.WHXB202212014

This review comprehensively presents the state-of-the-art progress of metal aerogels, highlighting their synthetic strategies and application prospects.

论文　**ARTICLE**

MoP-NC 纳米球负载 Pt 纳米粒子用于高效甲醇电解

李萌，杨甫林，常进法，Alex Schechter，冯立纲



MoP-NC Nanosphere Supported Pt Nanoparticles for Efficient Methanol Electrolysis

Meng Li, Fulin Yang, Jinfa Chang, Alex Schechter, Ligang Feng

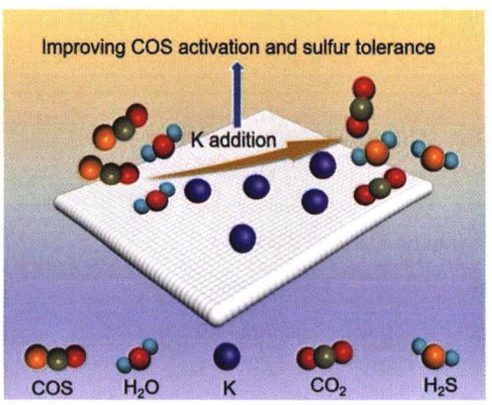
Acta Phys. -Chim. Sin. **2023,** *39* (9), 2301005

doi: 10.3866/PKU.WHXB202301005

Ultrafine Pt nanoparticles grown on MoP-NC nanosphere were effective for methanol electrolysis towards hydrogen generation.

钾改性氧化铝基羰基硫水解催化剂及其失活机理

雷淦昌，郑勇，曹彦宁，沈丽娟，王世萍，梁诗景，詹瑛瑛，江莉龙



Deactivation Mechanism of COS Hydrolysis over Potassium Modified Alumina

Ganchang Lei, Yong Zheng, Yanning Cao, Lijuan Shen, Shiping Wang, Shijing Liang, Yingying Zhan, Lilong Jiang

Acta Phys. -Chim. Sin. **2023,** *39* (9), 2210038

doi: 10.3866/PKU.WHXB202210038

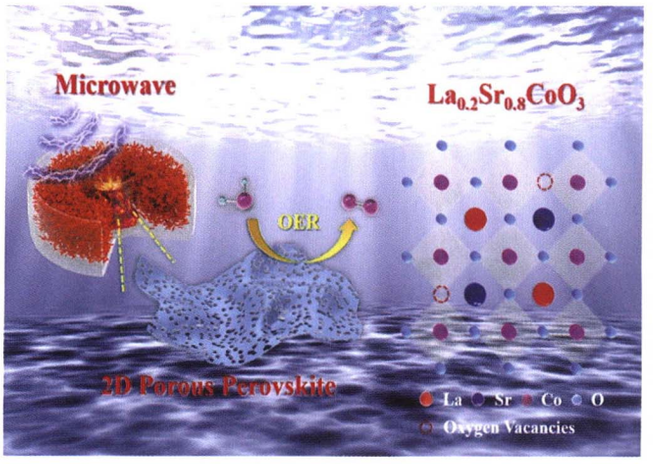
The addition of K species to the Al_2O_3 structure significantly improves the COS activation and sulfur resistance of the catalyst, exhibiting a high catalytic performance for COS hydrolysis.

微波热冲快速制备二维多孔 $La_{0.2}Sr_{0.8}CoO_3$ 钙钛矿用于高效电催化析氧反应

胡荣，韦丽云，鲜靖林，房光钰，吴植傲，樊淼，郭家越，李青翔，刘凯思，姜会钰，徐卫林，万骏，姚永刚

Microwave Shock Process for Rapid Synthesis of 2D Porous $La_{0.2}Sr_{0.8}CoO_3$ Perovskite as an Efficient Oxygen Evolution Reaction Catalyst

Rong Hu, Liyun Wei, Jinglin Xian, Guangyu Fang, Zhiao Wu, Miao Fan, Jiayue Guo, Qingxiang Li, Kaisi Liu, Huiyu Jiang, Weilin Xu, Jun Wan, Yonggang Yao



Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212025

doi: 10.3866/PKU.WHXB202212025

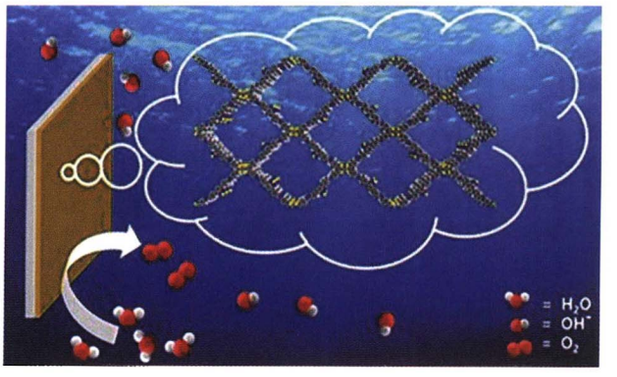
Two-dimensional porous $La_{0.2}Sr_{0.8}CoO_3$ perovskite with oxygen-rich vacancies prepared by microwave shock displays excellent electrocatalytic oxygen evolution performance.

基于四硫富瓦烯的无金属共价有机框架材料用于高效电催化析氧反应

夏伟锋，季成宇，王锐，裘式纶，方千荣

Metal-Free Tetrathiafulvalene Based Covalent Organic Framework for Efficient Oxygen Evolution Reaction

Weifeng Xia, Chengyu Ji, Rui Wang, Shilun Qiu, Qianrong Fang



Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212057

doi: 10.3866/PKU.WHXB202212057

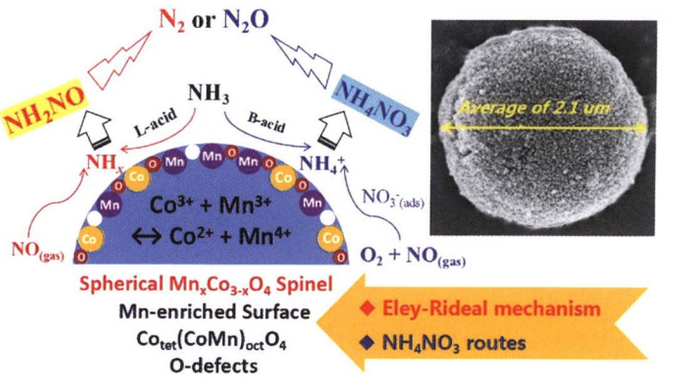
The introduction of the TTF conductive monomer into COF materials significantly improves their OER performance.

球形表面富锰 $Mn_xCo_{3-x}O_{4-\eta}$ 尖晶石型催化剂选择性催化还原 NO_x 研究

高凤雨，刘恒恒，姚小龙，Zaharaddeen Sani，唐晓龙，罗宁，易红宏，赵顺征，于庆君，周远松

Spherical $Mn_xCo_{3-x}O_{4-\eta}$ Spinel with Mn-Enriched Surface as High-Efficiency Catalysts for Low-Temperature Selective Catalytic Reduction of NO_x by NH_3

Fengyu Gao, Hengheng Liu, Xiaolong Yao, Zaharaddeen Sani, Xiaolong Tang, Ning Luo , Honghong Yi, Shunzheng Zhao, Qingjun Yu, Yuansong Zhou



Acta Phys. -Chim. Sin. **2023,** *39* (9), 2212003

doi: 10.3866/PKU.WHXB202212003

Spinel-structured Mn-Co spherical particles are prepared for the removal of NO_x *via* selective catalytic reduction using NH_3 and the physicochemical properties and reaction mechanism are studied.

物理化学学报(WULI HUAXUE XUEBAO)第 39 卷第 9 期(2023. 09. 15)
ACTA PHYSICO-CHIMICA SINICA, Vol. 39, No. 9 (September, 2023)

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, China
电　　话	+86-10-62751724, +86-10-62756388	Tel.:	+86-10-62751724, +86-10-62756388
主　　任	张小娟	Editorial Director:	Xiaojuan Zhang
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		
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**	**Website:**	**http://www.whxb.pku.edu.cn**

ISSN 1000-6818　09>
9 771000 681209

定价：**50.00** 元　　**2023** 年 **9** 月 **15** 日出版　　广告经营许可证：**京海市监广登字 20170232 号**　　国内邮发代号：**82-163**