

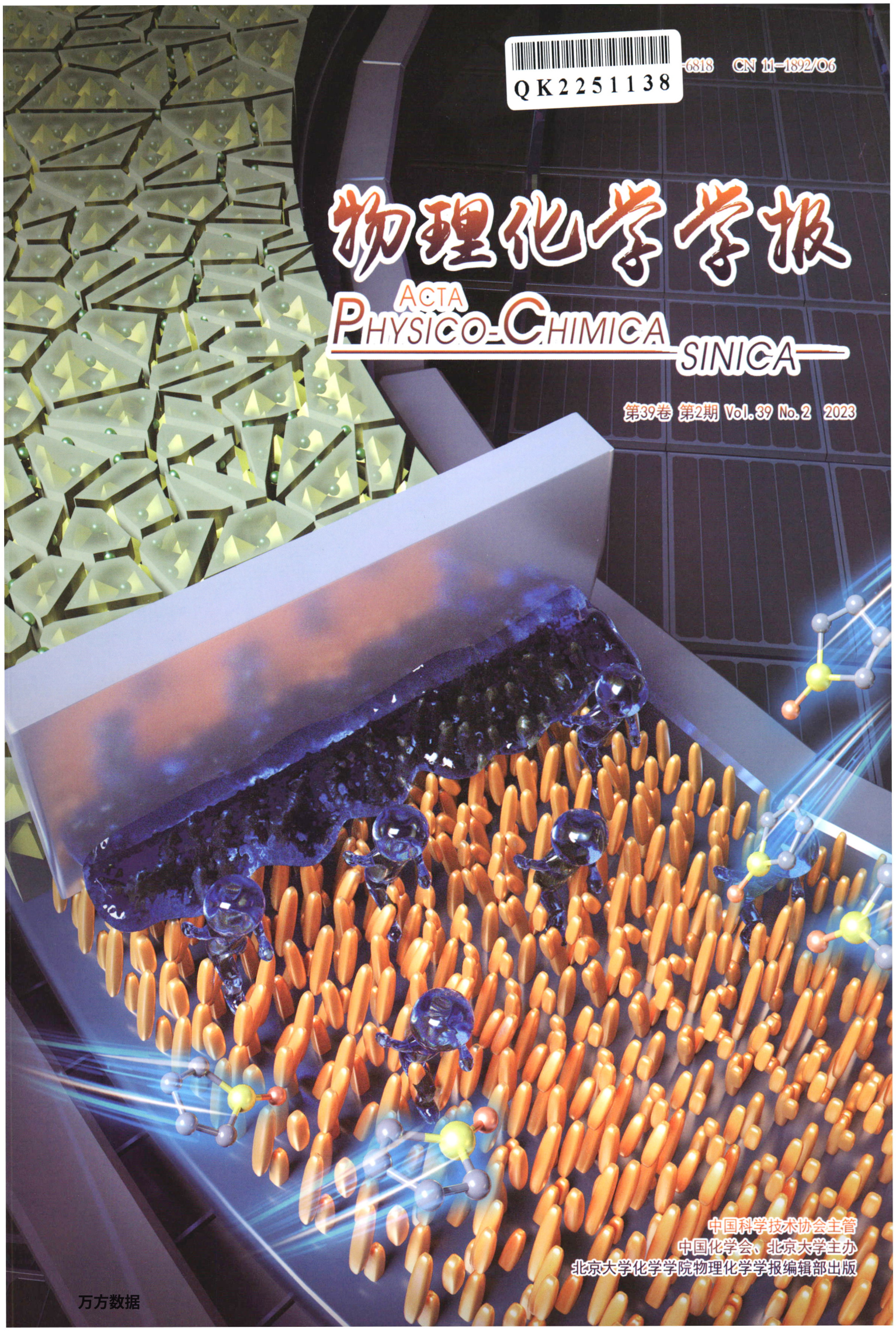


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北京大学化学学院物理化学学报编辑部出版

COVER



The cover image shows the application of a sequential blade-coating deposition strategy for preparing large-area perovskite thin films.

In article No. 2203048, Wen *et al.* demonstrated that high-quality perovskite films can be obtained without residual unreacted lead iodide by incorporating tetrahydrothiophene 1-oxide into the lead iodide precursor solution to control the microstructure of the blade-coated lead iodide films.

CONTENTS

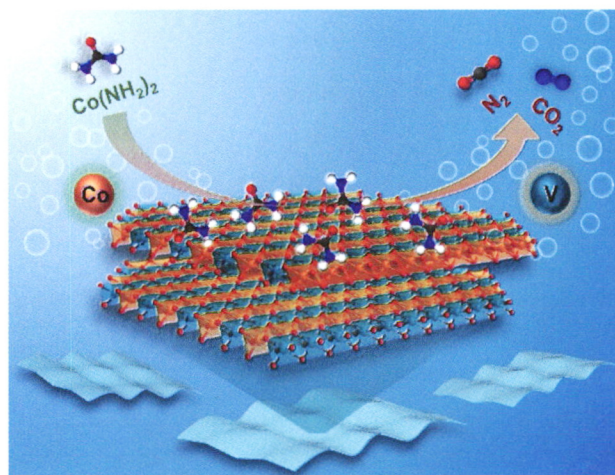
通讯 COMMUNICATION

钴钒水滑石纳米片用于电催化尿素氧化

刘瑶钰, 王宇辰, 刘碧莹, Mahmoud Amer,
严凯

**Cobalt-Vanadium Layered Double Hydroxides
Nanosheets as High-Performance Electrocatalysts
for Urea Oxidation Reaction**

Yaoyu Liu, Yuchen Wang, Biying Liu,
Mahmoud Amer, Kai Yan



Acta Phys. -Chim. Sin. **2023**, 39 (2), 2205028

doi: 10.3866/PKU.WHXB202205028

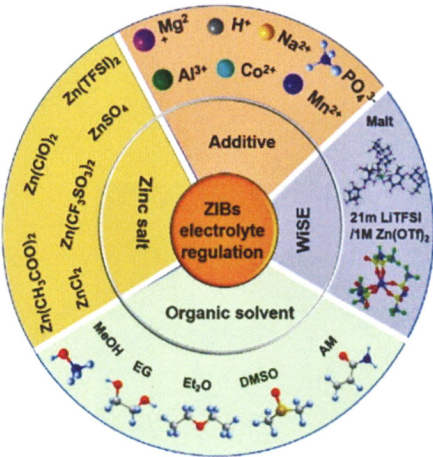
Cobalt-vanadium layered double hydroxides nanosheets were fabricated *via* a facile method to achieve high urea oxidation reaction activity.

电解液调控策略提升水系锌离子电池正极材料
电化性能

齐亚斌, 夏永姚

Electrolyte Regulation Strategies for Improving
the Electrochemical Performance of Aqueous
Zinc-Ion Battery Cathodes

Yae Qi, Yongyao Xia



Acta Phys. -Chim. Sin. 2023, 39 (2), 2205045
doi: 10.3866/PKU.WHXB202205045

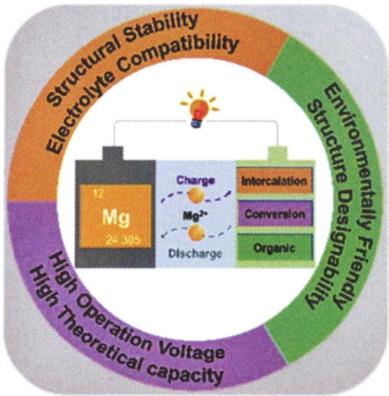
This article reviews the electrolyte investigation approaches for enhancing the electrochemical performance of aqueous ZIBs cathodes.

镁离子电池正极材料研究进展

张默淳, 冯硕, 邹赞玲, 李彦光

Cathode Materials for Rechargeable
Magnesium-Ion Batteries: A Review

Mochun Zhang, Shuo Feng, Yunling Wu,
Yanguang Li



Acta Phys. -Chim. Sin. 2023, 39 (2), 2205050
doi: 10.3866/PKU.WHXB202205050

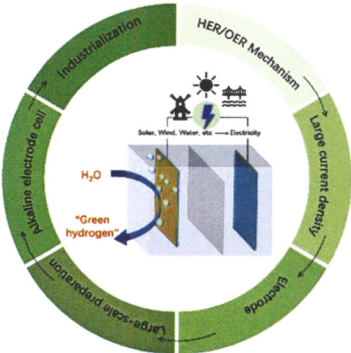
This review focuses on recent research advances in intercalation, conversion and organic cathode materials for magnesium-ion batteries. We summarize their advantages, challenges, and different strategies for performance improvements.

“绿氢”工业化碱性催化剂研究现状及未来
展望

徐斯然, 吴奇, 卢帮安, 唐堂, 张佳楠, 胡劲松

Recent Advances and Future Prospects on
Industrial Catalysts for Green Hydrogen
Production in Alkaline Media

Siran Xu, Qi Wu, Bang-an Lu, Tang Tang,
Jia-Nan Zhang, Jin-Song Hu



Acta Phys. -Chim. Sin. 2023, 39 (2), 2209001
doi: 10.3866/PKU.WHXB202209001

From the reasonable design of high-efficient and stable electrolytic water splitting catalysts to industrial electrodes, commercial membranes, and the construction of core components for electrolytic cells, may improve the understanding of industrial design principles that can be applied to develop the next generation of industrial electrolytic cells with enhanced efficiency, safety, and practicality.

碱性聚合物电解质膜的表面锥形阵列结构提升燃料电池性能

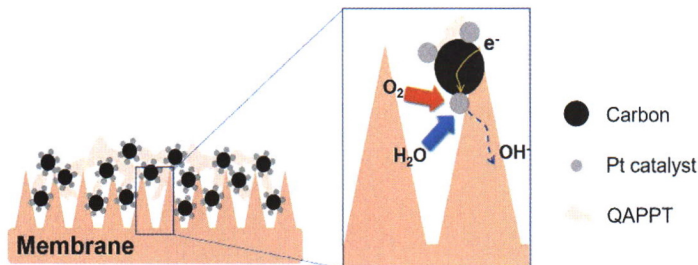
张婧雯, 马华隆, 马军, 胡梅雪, 李启浩, 陈胜, 宁添妹, 葛创新, 刘晰, 肖丽, 庄林, 张熠霄, 陈立桅

Cone Shaped Surface Array Structure on an Alkaline Polymer Electrolyte Membrane Improves Fuel Cell Performance

Jingwen Zhang, Hualong Ma, Jun Ma, Meixue Hu, Qihao Li, Sheng Chen, Tianshu Ning, Chuangxin Ge, Xi Liu, Li Xiao, Lin Zhuang, Yixiao Zhang, Liwei Chen

Acta Phys. -Chim. Sin. **2023**, 39 (2), 2111037

doi: 10.3866/PKU.WHXB202111037



A cone-shaped surface array structure on an alkaline polymer electrolyte membrane improves the fuel cell performance by enhancing the hydrophilicity of the membrane and the utilization efficiency of the catalyst.

控制碘化铅形貌两步连续刮涂法大面积制备甲基钙钛矿薄膜

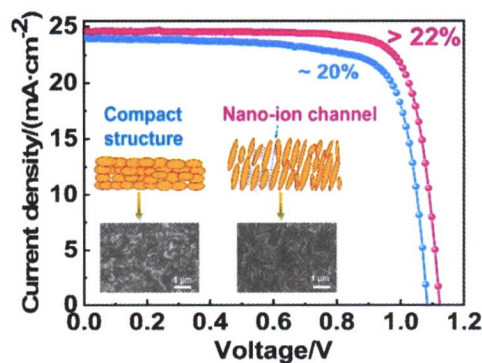
文永涛, 李静, 高晓峰, 田聪聪, 朱昊, 余国木, 张晓俐, Hyesung Park, 黄福志

Two-Step Sequential Blade-Coating Large-Area FA-Based Perovskite Thin Film via a Controlled PbI₂ Microstructure

Yongtao Wen, Jing Li, Xiaofeng Gao, Congcong Tian, Hao Zhu, Guomu Yu, Xiaoli Zhang, Hyesung Park, Fuzhi Huang

Acta Phys. -Chim. Sin. **2023**, 39 (2), 2203048

doi: 10.3866/PKU.WHXB202203048



The efficiency of FA-based devices reached 22.77%, and high-performance large-area modules were successfully fabricated.

高安全锂离子电池复合集流体的界面强化

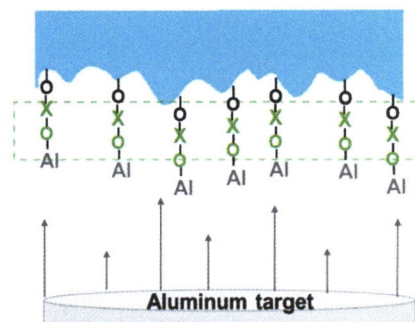
汪茹, 刘志康, 严超, 伽龙, 黄云辉

Interface Strengthening of Composite Current Collectors for High-Safety Lithium-Ion Batteries

Ru Wang, Zhikang Liu, Chao Yan, Long Qie, Yunhui Huang

Acta Phys. -Chim. Sin. **2023**, 39 (2), 2203043

doi: 10.3866/PKU.WHXB202203043



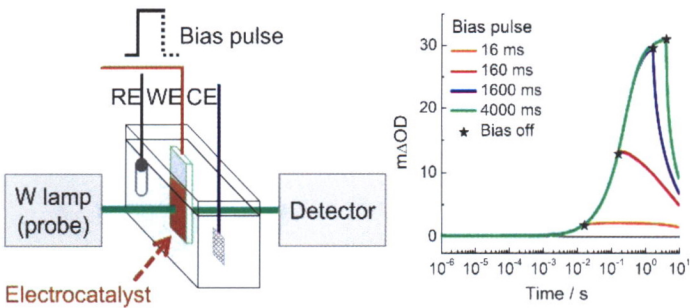
To solve the problems of weak interface bonding forces in metalized polymer CCs and weak electrolyte compatibility, herein, a nano oxide strengthening layer is introduced between the polymer substrate and the metal aluminum layer. By enhancing interface mechanical interlocking and chemical bonding, the bonding force between the PET substrate and metal aluminum layer was increased, which enhances electrolyte compatibility. These findings provide theoretical and technical guidance for the development and application-scope expansion of composite CCs.

微秒时间分辨的工况电化学紫外可见吸收光谱
测量系统

尉瑞芳, 李东峰, 尹恒, 王秀丽, 李灿

Operando Electrochemical UV-Vis Absorption
Spectroscopy with Microsecond Time Resolution

Ruifang Wei, Dongfeng Li, Heng Yin,
Xiuli Wang, Can Li



Acta Phys. -Chim. Sin. **2023**, 39 (2), 2207035

doi: 10.3866/PKU.WHXB202207035

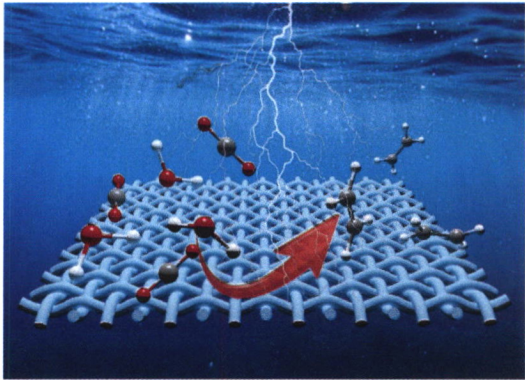
Time-resolved *operando* electrochemical UV-Vis absorption spectroscopy with 3 μs time resolution is realized to examine water oxidation reaction dynamics.

富氧空位的非晶氧化铜高选择性电催化还原
CO₂ 制乙烯

韦天然, 张书胜, 刘倩, 邱园, 罗俊, 刘熙俊

Oxygen Vacancy-Rich Amorphous Copper Oxide
Enables Highly Selective Electroreduction of
Carbon Dioxide to Ethylene

Tianran Wei, Shusheng Zhang, Qian Liu, Yuan Qiu,
Jun Luo, Xijun Liu



Acta Phys. -Chim. Sin. **2023**, 39 (2), 2207026

doi: 10.3866/PKU.WHXB202207026

An amorphous CuO_x nanofilm has been designed as a highly selective catalyst for the ECR-to-C₂H₄ process, showing a remarkably high Faradaic efficiency, C₂H₄ partial current density, and long-term durability.

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