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Latest and Hot Papers

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近期热点文章 Latest and Hot Papers

Heterogeneous Spin States in Ultrathin Nanosheets Induce Subtle Lattice Distortion to Trigger Efficient Hydrogen Evolution

Y. Liu, X. Hua, C. Xiao, T. Zhou, P. Huang, Z. Guo, B. Pan, Y. Xie

J. Am. Chem. Soc. DOI: 10.1021/jacs.6b00858

Mn 掺杂 CoSe₂ 纳米片,使晶格发生畸变,产生更多的边沿活性位,对氢析出反应(HER)表现高的催化活性,交换电流密度为 68.3 $\mu\text{A}\cdot\text{cm}^{-2}$.

Kinetic Study of Hydrogen Evolution Reaction over Strained MoS₂ with Sulfur Vacancies Using Scanning Electrochemical Microscopy

H. Li, M. Du, M. J. Mleczko, A. L. Koh, Y. Nishi, E. Pop, A. J. Bard, X. Zheng

J. Am. Chem. Soc. DOI: 10.1021/jacs.6b01377

采用扫描电化学显微(SECM)研究存在 S 缺陷的 MoS₂ 晶面的 HER 动力学行为,发现 S 缺陷引起的晶格畸变导致 HER 反应速度提高 4 倍.

Hierarchical NiCo₂O₄ Hollow Microcuboids as Bifunctional Electrocatalysts for Overall Water-Splitting

X. Gao, H. Zhang, Q. Li, X. Yu, Z. Hong, X. Zhang, C. Liang, Z. Lin

Angew. Chem. Int. Ed. DOI: 10.1002/anie.201600525
发现碱性体系氧析出反应(OER)催化剂 NiCo₂O₄ 也可以催化 HER. 两个电极均采用空心立方体结构的 NiCo₂O₄ 催化剂,电解水的电流密度为 10 $\text{mA}\cdot\text{cm}^{-2}$ 时,电压为 1.65 V.

Tailoring Copper Nanocrystals towards C₂ Products in Electrochemical CO₂ Reduction

A. Loiudice, P. Lobaccaro, E. A. Kamali, T. Thao, B. H. Huang, J. W. Ager, R. Buonsanti

Angew. Chem. Int. Ed. DOI: 10.1002/anie.201601582
CO₂ 还原反应(CO₂RR)催化剂 Cu 纳米晶体的形貌效应,发现边长 44 nm 的 Cu 纳米立方体具有较高的催化选择性,电还原产生乙烯的法拉第效率为 41%.

Hierarchical Tubular Structures Composed of Co₃O₄ Hollow Nanoparticles and Carbon Nanotubes for Lithium Storage

Y. M. Chen, L. Yu, X. W. Lou

Angew. Chem. Int. Ed. DOI: 10.1002/anie.201600133

合成了 Co₃O₄ 和碳纳米管(CNT)的纳米复合结构,用作锂离子电池负极材料,0.1 $\text{A}\cdot\text{g}^{-1}$ 电流密度下的容量为 1281 $\text{mAh}\cdot\text{g}^{-1}$,可循环 200 周.

Balancing Surface Adsorption and Diffusion of Lithium-Polysulfides on Nonconductive Oxides for Lithium-Sulfur Battery Design

X. Tao, J. Wang, C. Liu, H. Wang, H. Yao, G. Zheng, Z. W. Seh, Q. Cai, W. Li, G. Zhou, C. Zu, Y. Cui

Nature Commun. DOI: 10.1038/ncomms11203

研究了多种金属氧化物和碳的复合物作用锂硫电池正极骨架,发现多硫化物在氧化物表面单层吸附,然后通过表面扩散进一步提升沉积量.

Coupled Molybdenum Carbide and Reduced Graphene Oxide Electrocatalysts for Efficient Hydrogen Evolution

J.-S. Li, Y. Wang, C.-H. Liu, S.-L. Li, Y.-G. Wang, L.-Z. Dong, Z.-H. Dai, Y.-F. Li, Y.-Q. Lan

Nature Commun. DOI: 10.1038/ncomms11204

合成了 Mo₂C 与还原石墨烯氧化物(rGO)复合催化剂,对酸性介质中的 HER 表现出与 Pt/C 相当的催化活性和稳定性.

Silicon Oxycarbide Glass-Graphene Composite Paper Electrode for Long-Cycle Lithium-Ion Batteries

L. David, R. Bhandavat, U. Barrera, G. Singh

Nature Commun. DOI: 10.1038/ncomms10998

合成了 SiOC 与 rGO 的复合材料,用于锂离子电池负极(2 $\text{mg}\cdot\text{cm}^{-2}$),循环 1020 周后容量为 588 $\text{mAh}\cdot\text{g}^{-1}_{\text{electrode}}$ ($\sim 393 \text{mAh}\cdot\text{cm}^{-3}_{\text{electrode}}$).

Semiconductor-Electrocatalyst Interfaces: Theory, Experiment, and Applications in Photoelectrochemical Water Splitting

M. R. Nellist, F. A. L. Laskowski, F. Lin, T. J. Mills, S. W. Boettcher

Acc. Chem. Res. DOI: 10.1021/acs.accounts.6b00001

关于光电化学分解水中半导体/电催化剂界面的评述性文章. 引用了 53 篇参考文献.

Single-Particle Plasmon Voltammetry (spPV) for Detecting Anion Adsorption

C. P. Byers, B. S. Hoener, W.-S. Chang, S. Link, C. F. Landes

Nano Lett. DOI: 10.1021/acs.nanolett.5b04990

一种利用纳米颗粒和薄膜等离子共振效应检测表面阴离子吸附的方法,可检测电化学条件下单个纳米颗粒表面硫酸根等阴离子的吸附。

Ligand-Free Noble Metal Nanocluster Catalysts on Carbon Supports via “Soft” Nitriding

B. Liu, H. Yao, W. Song, L. Jin, I. M. Mosa, J. F. Rusling, S. L. Suib, J. He

J. Am. Chem. Soc. DOI: 10.1021/jacs.6b01702

一种合成贵金属纳米催化剂的新方法. 先将碳载体在 300 °C 下用尿素预处理,使表面生成氮化物,再用于还原贵金属前体盐. 获得的贵金属纳米催化剂对甲醇电氧化具有优异的催化活性。

Synergistic Cocatalytic Effect of Carbon Nanodots and Co₃O₄ Nanoclusters for the Photoelectrochemical Water Oxidation on Hematite

P. Zhang, T. Wang, X. Chang, L. Zhang, J. Gong

Angew. Chem. Int. Ed. DOI: 10.1002/anie.201600918

发现在 α -Fe₂O₃ 光阳极表面同时负载 Co₃O₄ 催化剂和碳量子点,可协同催化 OER. 光照条件下 1.23V 的阳极电流为 1.48 mA·cm⁻²。

Water Electrolysis on La_{1-x}Sr_xCoO_{3- δ} Perovskite Electrocatalysts

J. T. Mefford, X. Rong, A. M. Abakumov, W. G. Hardin, S. Dai, A. M. Kolpak, K. P. Johnston, K. J. Stevenson

Nature Commun. DOI: 10.1038/ncomms11053

通过 Sr 的部分取代,在 LaCoO₃ 钙钛矿氧化物中可控地制造氧空穴,发现 SrCoO_{2.7} 具有最高的室温碱性 OER 催化活性。

Efficient Water Oxidation Using CoMnP Nanoparticles

D. Li, H. Baydoun, C. N. Verani, S. L. Brock

J. Am. Chem. Soc. DOI: 10.1021/jacs.6b01543

合成了单分散 CoMnP 纳米颗粒,碳载后用作碱性 OER 催化剂,性能优于 CoMnO₂,长时间工作后因

P 的溶出性能有所下降。

Discovery of Abnormal Lithium-Storage Sites in Molybdenum Dioxide Electrodes

J. K. Shon, H. S. Lee, G. O. Park, J. Yoon, E. Park, G. S. Park, S. S. Kong, M. Jin, J.-M. Choi, H. Chang, S. Doo, J. M. Kim, W.-S. Yoon, C. Pak, H. Kim, G. D. Stucky

Nature Commun. DOI: 10.1038/ncomms11049

发现介孔 MoO₂ 具有超过理论容量两倍的储锂容量(首周 1814 mAh·g⁻¹,50 周后仍保持稳定),可能是特殊孔结构储锂,而不是转化反应。

Li(V_{0.5}Ti_{0.5})S₂ as a 1 V Lithium Intercalation Electrode

S. J. Clark, D. Wang, A. R. Armstrong, P. G. Bruce

Nature Commun. DOI: 10.1038/ncomms10898

以 Li(V_{0.5}Ti_{0.5})S₂ 为锂离子电池负极材料,可在 1 V 电势平台可逆嵌脱锂,3C 的放电倍率下容量为 200 mAh·g⁻¹,优于目前所有高电势负极材料。

A Redox-Active Binder for Electrochemical Capacitor Electrode

C. Benoit, D. Demeter, D. Bélanger, C. Cougnon

Angew. Chem. Int. Ed. DOI: 10.1002/anie.201601395

一种提高多孔碳基超电容性能的方法. 将电化学活性基团接枝在聚合物粘接剂上,而不是修饰在碳材料表面,既提高容量又不影响碳材料性能。

Recent Advances in Inorganic Heterogeneous Electrocatalysts for Reduction of Carbon Dioxide

D. D. Zhu, J. L. Liu, S. Z. Qiao

Adv. Mater. DOI: 10.1002/adma.201504766

关于 CO₂ 电还原催化剂的综述. 引用了 210 篇参考文献。

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