

## 近期热点文章 Latest and Hot Papers

### Suppression of Lithium Dendrite Growth Using Cross-Linked Polyethylene/Poly (ethylene oxide) Electrolytes: A New Approach for Practical Lithium-Metal Polymer Batteries

R. Khurana, J. L. Schaefer, L. A. Archer, G. W. Coates

*J. Am. Chem. Soc.* DOI: 10.1021/ja502133j

将聚乙烯和聚氧乙烯的交联共聚物用作金属锂电池隔膜, 不仅获得较高的离子电导率, 还可抑制锂枝晶的生长.

### Dendritic Assembly of Gold Nanoparticles during Fuel-Forming Electrocatalysis

K. Manthiram, Y. Surendranath, A. P. Alivisatos

*J. Am. Chem. Soc.* DOI: 10.1021/ja502628r

在 CO<sub>2</sub> 电还原过程中发现玻碳电极表面硫醇包覆的 Au 纳米粒子发生一种分形聚集, 与表面活性剂硫醇在一定电势下的还原脱附有关.

### Hydrated Manganese(II) Phosphate (Mn<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> · 3H<sub>2</sub>O) as a Water Oxidation Catalyst

K. Jin, J. Park, J. Lee, K. D. Yang, G. K. Pradhan, U. Sim, D. Jeong, H. L. Jang, S. Park, D. Kim, N.-E. Sung, S. H. Kim, S. Han, K. T. Nam

*J. Am. Chem. Soc.* DOI: 10.1021/ja5026529

水合磷酸锰作为中性介质中的水氧化催化剂, 该结构可稳定姜-泰勒畸变的 Mn(III) 态, 使 Mn(II) 催化中心更容易被氧化.

### From Metal-Organic Framework to Nitrogen Decorated Nanoporous Carbons: High CO<sub>2</sub> Uptake and Efficient Catalytic Oxygen Reduction

A. Aijaz, N. Fujiwara, Q. Xu

*J. Am. Chem. Soc.* DOI: 10.1021/ja5003907

以 ZIF-8 金属有机框架化合物为前体制备多孔氮杂碳, 具有高的 CO<sub>2</sub> 吸附容量和氧还原反应 (ORR) 催化活性.

### Facile One-Pot, One-Step Synthesis of a Carbon Nanoarchitecture for an Advanced Multifunctional Electrocatalyst

Z. Wen, S. Ci, Y. Hou, J. Chen

*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201402574  
在碳纳米管内壁生长氮杂石墨烯, 具有高的氮含量, 而且包含 Fe 纳米粒子, 对碱性介质中的 ORR 具有高的催化活性.

### Redox Active Iron Nitrosyl Units in Proton Reduction Electrocatalysis

C. -H. Hsieh, S. Ding, Ö. F. Erdem, D. J. Crouthers, T. Liu, C. C. L. McCrory, W. Lubitz, C. V. Popescu, J. H. Reibenspies, M. B. Hall, M. Y. Darensbourg

*Nature Commun.* DOI: 10.1038/ncomms4684

一种以亚硝酰基为配体的双核 Fe 分子催化剂, 对氢析出反应 (HER) 表现出高的催化活性.

### Coaxial Wet-Spun Yarn Supercapacitors for High-Energy Density and Safe Wearable Electronics

L. Kou, T. Huang, B. Zheng, Y. Han, X. Zhao, K. Gopalsamy, H. Sun, C. Gao

*Nature Commun.* DOI: 10.1038/ncomms4754

采用同轴湿旋涂的方法制备了具有核鞘结构的聚合物包覆碳纳米材料, 应用于高性能超级电容器.

### Efficient Water Oxidation Using Nanostructured $\alpha$ -Nickel-Hydroxide as an Electrocatalyst

M. Gao, W. Sheng, Z. Zhuang, Q. Fang, S. Gu, J. Jiang, Y. Yan

*J. Am. Chem. Soc.* DOI: 10.1021/ja502128j

发现  $\alpha$ -Ni(OH)<sub>2</sub> 对碱性介质氧析出反应 (OER) 具有高的催化活性和稳定性, 优于 RuO<sub>2</sub> 催化剂.

### Nickel-Iron Oxyhydroxide Oxygen-Evolution Electrocatalysts: The Role of Intentional and Incidental Iron Incorporation

L. Trotochaud, S. L. Young, J. K. Ranney, S. W. Boettcher

*J. Am. Chem. Soc.* DOI: 10.1021/ja502379c

仔细地研究了碱性介质 OER 的 NiFe 催化剂的活性组分, Fe 的加入大幅度提高了 NiOOH 层的电导率, 即便 Fe 来至 KOH 溶液中的杂质.

### Hydrogen Evolution by a Metal-Free Electro-

**catalyst**

Y. Zheng, Y. Jiao, Y. Zhu, L. H. Li, Y. Han, Y. Chen, A. Du, M. Jaroniec, S. Z. Qiao  
*Nature Commun.* DOI: 10.1038/ncomms4783  
不含金属的石墨化氮化碳和氮杂碳的复合物表现出高的氢析出反应(HER)催化活性.

**A Molecular Approach to Self-Supported Cobalt-Substituted ZnO Materials as Remarkably Stable Electrocatalysts for Water Oxidation**

J. Pfrommer, M. Lublow, A. Azarpira, C. Göbel, M. Lücke, A. Steigert, M. Pogrzeba, P. W. Menezes, A. Fischer, T. Schedel-Niedrig, M. Driess  
*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201400243  
以含 Co 和 Zn 的双金属配合物为前体制备 Co 取代的 ZnO, 对中性及弱碱性介质 OER 表现出高的催化活性.

**Boron Nitride Nanosheet on Gold as an Electrocatalyst for Oxygen Reduction Reaction: Theoretical Suggestion and Experimental Proof**

K. Uosaki, G. Elumalai, H. Noguchi, T. Masuda, A. Lyalin, A. Nakayama, T. Taketsugu  
*J. Am. Chem. Soc.* 136 (2014) 6542.  
DFT 计算预测 BN 薄层覆盖在 Au 表面可具有 ORR 催化活性, 而且得到了实验的验证.

**Electroreduction of Carbon Monoxide to Liquid Fuel on Oxide-Derived Nanocrystalline Copper**

C. W. Li, J. Ciston, M. W. Kanan  
*Nature* 508(2014)7497.  
发现以  $\text{Cu}_2\text{O}$  为前体制得的 Cu 纳米晶对  $\text{CO}_2$  电还原反应在中等极化下 ( $-0.25 \sim -0.5 \text{ V vs. RHE}$ ) 具有高达 96% 的法拉第效率, 相互连接的纳米晶结构可能至关重要.

**Defect-Induced Plating of Lithium Metal Within Porous Graphene Networks**

R. Mukherjee, A. V. Thomas, D. Datta, E. Singh, J. Li, O. Eksik, V. B. Shenoy, N. Koratkar  
*Nature Commun.* DOI: 10.1038/ncomms4710  
利用多孔石墨烯网络结构沉积金属锂, 表现出高的容量和良好的循环性能.

**Polymeric Schiff Bases as Low-Voltage Redox Centers for Sodium-Ion Batteries**

E. Castillo-Martínez, J. Carretero-González, M. Ar-

mand

*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201402402  
以聚合物希夫碱为钠离子电池电极材料, 在  $0 \sim 1.5 \text{ V (vs. Na}^+/\text{Na)}$  电势范围内具有  $350 \text{ mAh} \cdot \text{g}^{-1}$  的容量.

**Atomic Mechanism of Dynamic Electrochemical Lithiation Processes of  $\text{MoS}_2$  Nanosheets**

L. Wang, Z. Xu, W. Wang, X. Bai  
*J. Am. Chem. Soc.* 136(2014) 6693.  
采用原位高分辨透射电镜研究  $\text{MoS}_2$  纳米片电化学嵌锂的过程, 发现锂离子占据层间 S-S 四面体位.

**Water Oxidation by an Electropolymerized Catalyst on Derivatized Mesoporous Metal Oxide Electrodes**

D. L. Ashford, A. M. Lapides, A. K. Vannucci, K. Hanson, D. A. Torelli, D. P. Harrison, J. L. Templeton, T. J. Meyer  
*J. Am. Chem. Soc.* 136(2014) 6578.  
以电聚合的方法将吸光剂和 OER 催化剂一起构筑于金属氧化物电极表面, 表现出良好的催化活性和几个小时内没有下降的稳定性.

**Carbon Nanotube-Templated Synthesis of Covalent Porphyrin Network for Oxygen Reduction Reaction**

I. Hijazi, T. Bourgeteau, R. Cornut, A. Morozaan, A. Filoramo, J. Leroy, V. Derycke, B. Jousset, S. Campidelli  
*J. Am. Chem. Soc.* 136(2014) 6348.  
将多壁碳纳米管功能化, 其表面形成 Co 卟啉共价网络, 对酸性介质 ORR 具有较好的催化活性.

**Role of Surface Structure on Li-Ion Energy Storage Capacity of Two-Dimensional Transition-Metal Carbides**

Y. Xie, M. Naguib, V. N. Mochalin, M. W. Barsoum, Y. Gogotsi, X. Yu, K. -W. Nam, X. -Q. Yang, A. I. Kolesnikov, P. R. C. Kent  
*J. Am. Chem. Soc.* 136(2014) 6385.  
采用 DFT 计算和原位 X 射线吸收光谱研究了一系列二维过渡金属碳化物的储锂行为.

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