

## 近期热点文章 Latest and Hot Papers

### A New Rechargeable Sodium Battery Utilizing Reversible Topotactic Oxygen Extraction/Insertion of $\text{CaFeO}_z$ ( $2.5 \leq z \leq 3$ ) in An Organic Electrolyte

M. Hibino, R. Harimoto, Y. Ogasawara, R. Kido, A. Sugahara, T. Kudo, E. Tochigi, N. Shibata, Y. Ikuhara, N. Mizuno

*J. Am. Chem. Soc.* DOI: 10.1021/ja411365z

以  $\text{CaFeO}_3$  为正极材料, 充电时  $\text{CaFeO}_3$  还原为  $\text{CaFeO}_{2.5}$ , 释放出来的 O 与  $\text{Li}^+$  或  $\text{Na}^+$  生成氧化物.

### Detection of the Sn(III) Intermediate and the Mechanism of the Sn(IV)/Sn(II) Electroreduction Reaction in Bromide Media by Cyclic Voltammetry and Scanning Electrochemical Microscopy

J. Chang, A. J. Bard

*J. Am. Chem. Soc.* DOI: 10.1021/ja409958a

运用快速循环伏安 ( $100 \text{ V} \cdot \text{s}^{-1}$ ) 和扫描电化学显微研究 Sn(IV) 在 HB 介质中电还原的机理和中间产物.

### A Biomimetic Copper Water Oxidation Catalyst with Low Overpotential

T. Zhang, C. Wang, S. Liu, J. -L. Wang, W. Lin

*J. Am. Chem. Soc.* DOI: 10.1021/ja409267p

以 Cu(II) 配合物为氧析出反应的分子催化剂, 超电势为 640 mV. 实验与计算研究表明, 吡啶配体上的羟基对催化有促进作用.

### High-Power Electrochemical Energy Storage System Employing Stable Radical Pseudocapacitors

H. Maruyama, H. Nakano, M. Nakamoto, A. Sekiguchi  
*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201308302

将 Si、Ge、Sn 有机盐稳定自由基的反应用于超级电容器, 具有优秀的充放电循环性能.

### Direct Observation of the Oxygenated Species during Oxygen Reduction on a Platinum Fuel Cell Cathode

H. S. Casalongue, S. Kaya, V. Viswanathan, D. J. Miller, D. Friebel, H. A. Hansen, J. K. Nørskov, A.

Nilsson, H. Ogasawara

*Nature Commun.* DOI: 10.1038/ncomms3817

运用常压 X 射线光电子能谱 (XPS) 观察氧还原反应 (ORR) Pt 电极表面的 OH 吸附物种, 发现其结构与水合度与电极电势相关.

### Three-Dimensional Strutt Graphene Grown by Substrate-Free Sugar Blowing for High-Power-Density Supercapacitors

X. Wang, Y. Zhang, C. Zhi, X. Wang, D. Tang, Y. Xu, Q. Weng, X. Jiang, M. Mitome, D. Golberg, Y. Bando

*Nature Commun.* DOI: 10.1038/ncomms3905

合成出三维泡沫结构的石墨烯材料, 是一种优良的超级电容器电极材料.

### A Strategic Approach to Recharging Lithium-Sulphur Batteries for Long Cycle Life

Y. -S. Su, Y. Fu, T. Cochem, A. Manthiram

*Nature Commun.* DOI: 10.1038/ncomms3985

通过控制放电深度, 避免生成小分子量硫化物, 从而有效提升硫电极的循环性能. 500 周充放电循环容量保持在 99% 以上.

### Detection of Subsurface Structures underneath Dendrites Formed on Cycled Lithium Metal Electrodes

K. J. Harry, D. T. Hallinan, D. Y. Parkinson, A. A. MacDowell, N. P. Balsara

*Nature Mater.* 13(2014) 69.

采用硬 X 射线成像技术观察金属锂电极在充放电过程中的枝晶生长以及电极内部结构的变化.

### Two-Dimensional Hybrid Nanosheets of Tungsten Disulfide and Reduced Graphene Oxide as Catalysts for Enhanced Hydrogen Evolution

J. Yang, D. Voiry, S. J. Ahn, D. Kang, A. Y. Kim, M. Chhowalla, H. S. Shin

*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201307475

$\text{WS}_2$  与氧化石墨烯的复合物具有优良的氢析出反

应(HER)催化活性.

### Highly Efficient Platinum Group Metal Free Based Membrane-Electrode Assembly for Anion Exchange Membrane Water Electrolysis

C. C. Pavel, F. Cecconi, C. Emiliani, S. Santiccioli, A. Scaffidi, S. Catanorchi, M. Comotti

*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201308099

以碱性膜为隔膜、 $K_2CO_3$  为电解质的水电解技术, 氢电极催化剂为  $Ni/(CeO_2-La_2O_3)/C$ , 氧电极催化剂为  $CuCoO_x$ .

### Electrochemical Patterning and Detection of DNA Arrays on a Two-Electrode Platform

A. Furst, S. Landefeld, M. G. Hill, J. K. Barton

*J. Am. Chem. Soc.* 135(2013) 19099.

电化学方法构建 DNA 阵列电极.

### Mixed Close-Packed Cobalt Molybdenum Nitrides as Non-noble Metal Electrocatalysts for the Hydrogen Evolution Reaction

B. Cao, G. M. Veith, J. C. Neufeind, R. R. Adzic, P. G. Khalifah

*J. Am. Chem. Soc.* 135(2013) 19186.

Co 和 Mo 的复合氮化物  $Co_{0.6}Mo_{1.4}N_2$  作为酸性介质中的 HER 催化剂, 具有较好的活性和稳定性.

### Synergistic Interaction between Redox-Active Electrolyte and Binder-Free Functionalized Carbon for Ultrahigh Supercapacitor Performance

L. -Q. Mai, A. Minhas-Khan, X. Tian, K. M. Hercule, Y. -L. Zhao, X. Lin, X. Xu

*Nature Commun.* DOI: 10.1038/ncomms3923

将溶液中的氧化还原电对与高比表面碳电极结合起来, 提升了超级电容器的性能.

### High-Capacity Antimony Sulphide Nanoparticle-Decorated Graphene Composite as Anode for Sodium-Ion Batteries

D. Y. W. Yu, P. V. Prikhodchenko, C. W. Mason, S. K. Batabyal, J. Gun, S. Sladkevich, A. G. Medvedev, O. Lev

*Nature Commun.* DOI: 10.1038/ncomms3922

以石墨烯负载  $Sb_2S_3$  作为钠离子电池负极材料, 在  $50\text{ mA}\cdot\text{g}^{-1}$  的电流密度下, 容量可达  $730\text{ mAh}\cdot\text{g}^{-1}$ .

### Bio-inspired Nanocatalysts for the Oxygen Reduction Reaction

D. Grumelli, B. Wurster, S. Stepanow, K. Kern

*Nature Commun.* DOI: 10.1038/ncomms3904

在 Au 电极表面构造二维 MOF 结构, 表现出一定的氧还原催化活性.

### Synthesis of Convex Hexoctahedral Pt Micro/Nanocrystals with High-Index Facets and Electrochemistry-Mediated Shape Evolution

J. Xiao, S. Liu, N. Tian, Z. -Y. Zhou, H. -X. Liu, B. -B. Xu, S. -G. Sun

*J. Am. Chem. Soc.* 135(2013) 18754.

电位方波法合成表面具有  $\{15\ 5\ 3\}$  高指数晶面的 Pt 纳米晶.

### Renewable and Metal-Free Carbon Nanofibre Catalysts for Carbon Dioxide Reduction

B. Kumar, M. Asadi, D. Pisasale, S. Sinha-Ray, B. A. Rosen, R. Haasch, J. Abiade, A. L. Yarin, A. Salehi-Khojin

*Nature Commun.* DOI: 10.1038/ncomms3819

碳纳米纤维作为  $CO_2$  还原为 CO 的电催化剂, 在  $0.17\text{ V}$  超电势下, 电流密度比用 Ag 作为催化剂高一个数量级.

### High-Yield Electrochemical Production of Formaldehyde from $CO_2$ and Seawater

K. Nakata, T. Ozaki, C. Terashima, A. Fujishima, Y. Einaga

*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201308657

以硼杂金刚石为催化剂, 在海水中将  $CO_2$  高产率地电化学还原为甲醛. 产生甲醛的法拉第效率达 74%.

### Ionic-Liquid-Nanoparticle Hybrid Electrolytes: Applications in Lithium Metal Batteries

Y. Lu, K. Korf, Y. Kambe, Z. Tu, L. A. Archer

*Angew. Chem. Int. Ed.* DOI: 10.1002/anie.201307137

以离子液体和  $SiO_2$  纳米粒子作为 PC 溶剂中的电解质, 可使金属锂电极充放电循环超过 500 周.

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