

附件 1

大连市引进紧缺人才薪酬补贴申请表

| | | | | | | |
|---------------|---|-------|--------------------|-------|---------------|---|
| 姓名 | 徐文彬 | 性别 | 男 | 出生年月 | 1991.04 |  |
| 户籍所在地 | 辽宁丹东 | 民族 | 汉 | 政治面貌 | 党员 | |
| 联系电话 | 13624288820 | 身份证号 | 210623199104170993 | | | |
| 毕业时间 | 毕业院校 | | 专业 | | 学历 | 学位 |
| 2016.6 | 中国石油大学(华东) | | 材料工程 | | 研究生 | 硕士 |
| 专业技术职务资格 | | 助理工程师 | | | 职业资格 | |
| 现工作单位信息 | | | | | | |
| 引进时间 | 2016.7 | 认定时间 | 2017.3 | 申报行业 | 新能源 | |
| 紧缺岗位 | 电化学工程师 | 现工作岗位 | 储能技术 | 月平均工资 | 5000 | |
| 单位名称 | 中国科学院大连化学物理研究所 | | | | | |
| 单位联系人 | 解进 | 职务 | 人事主管 | 联系电话 | 0411-84379103 | |
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|-----------------|--|
| <p>业绩成果</p> | <p>一、在单位紧缺岗位工作业绩及产生效益情况： 参与国家自然科学基金一项，参与发表 SCI 论文 IF > 10 论文 4 篇。</p> <p>二、承担课题研究及团队中担任职务情况： 承担 CO₂ 电化学还原和高性能液流电池课题，职务为助理工程师，负责电化学氧化还原体系相关计算化学工作的方案设计和实施。</p> <p>三、获得荣誉、证书，拥有发明、专利等情况（含引进前获得）： 申请发明专利 3 件，发表 SCI 论文 10 篇（含合作论文），参与国家自然科学基金一项，山东省自然科学基金一项。优秀研究生干部，优秀毕业生等荣誉。</p> <p>四、其他相关情况：无</p> <p style="text-align: right;">本人签字 年 月 日</p> |
| <p>单位审核意见</p> | <p style="text-align: right;">单位公章 年 月 日</p> |
| <p>市人社局审核意见</p> | <p style="text-align: right;">年 月 日</p> |

备注：1. 时间填写到年月。

2. 一式三份、正反面打印。

项目：

1. 国家自然科学基金项目：基于络合技术的全钒液流电池正极电解液稳定性的调控研究
项目编号： 21706253

| 项目批准号 | 申请代码1 | 项目名称 | 项目负责人 | 依托单位 | 批准金额 | 项目起止年月 |
|------------|---------|-----------------------------|-------|----------------|------|-----------------|
| 1 21706253 | B081005 | 基于络合技术的全钒液流电池正极电解液热稳定性的调控研究 | 孙佳伟 | 中国科学院大连化学物理研究所 | 24 | 2018-01至2020-12 |

专利：

1. 一种 CO₂ 电化学还原用电极的制备及其电极和应用

 中华人民共和国国家知识产权局

110030
沈阳市和平区三好街 24 号
沈阳科苑专利商标代理有限公司 马驰(024-23983170)

发文日：
2017年10月11日

申请号或专利号：201710940718.2 发文序号：2017101102184580

专 利 申 请 受 理 通 知 书

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申请号：201710940718.2
申请日：2017 年 10 月 11 日
申请人：中国科学院大连化学物理研究所
发明创造名称：一种 CO₂ 电化学还原用电极的制备及其电极和应用

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专利技术申报书

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| 序号 | 发明人 | 工作单位 | 职称 | 主要贡献 (发明点) | 发明人签字 |
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| 2 | 张华民 | 大连化物所 | 研究员 | 方案指导 | 张华民 |
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| 联系电话 | 9577 | E-mail: | rongqian@dipc.ac.cn | | |

2. 一种 CO₂ 还原用阴极及制备和应用



中华人民共和国国家知识产权局

110030

沈阳市和平区三好街 24 号
沈阳科苑专利商标代理有限公司 马驰(024-23983170)

发文日:

2017 年 11 月 30 日



申请号或专利号: 201711237054.X

发文序号: 2017113001849280

专利申请受理通知书

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申请号: 201711237054.X
申请日: 2017 年 11 月 30 日
申请人: 中国科学院大连化学物理研究所
发明创造名称: 一种 CO₂ 电化学还原用电极及制备和应用

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审查员: 自动受理

审查部门: 专利局初审及流程管理部



200101
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|----|----------------|---------------------|---|
| 1 | 中国科学院大连化学物理研究所 | 大连市中山路 457 号 | 杜伟 0411-84379172 duwei@dicp.ac.cn |

注: 如专利申请涉及与所外单位共同申请, 需同时提交共同申请的约定合同文本复印件及共同申请人的委托代理协议书及缴纳相关费用, 并在申报书中注明申请、代理、年费等费用支付约定。

发明人情况

| 序号 | 发明人 | 工作单位 | 职称 | 主要贡献 (发明点) | 发明人签字 |
|----|-----|-------|-------|---------------|-------|
| 1 | 邱艳玲 | 大连化物所 | 高级工程师 | 方案设计及 实施 | 邱艳玲 |
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| 4 | 徐文斌 | 大连化物所 | 研究员 | 方案实施 | 徐文斌 |
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论文:

1. ACS Catal. 2017, 7, 6302–6310

Copper Electrode Fabricated via Pulse Electrodeposition: Toward High Methane Selectivity and Activity for CO₂ Electroreduction

Yan-Ling Qiu,[†] He-Xiang Zhong,^{†,§} Tao-Tao Zhang,^{†,‡} Wen-Bin Xu,[†] Xian-Feng Li,^{*,†,§} and Hua-Min Zhang^{*,†,§}

[†]Division of Energy Storage, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Zhongshan Road 457, Dalian 116023, China

[‡]University of Chinese Academy of Sciences, Beijing 100049, China

[§]Collaborative innovation Center of Chemistry for Energy Materials (iChEM), Dalian 116023, China

Supporting Information

ABSTRACT: Electrochemical reduction of CO₂ (ERC) to methane has significant economic benefits and represents one promising solution for energy and environmental sustainability. However, traditional metal electrodes suffer from higher overpotentials, low activities, and poor selectivity. In this article, the pulse electrodeposition (P-ED) method is employed to prepare a copper electrode for ERC. The P-ED



2. Adv. Funct. Mater. 2018, 1704987

FULL PAPER

Li-S Batteries

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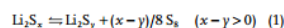
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Polysulfide Stabilization: A Pivotal Strategy to Achieve High Energy Density Li–S Batteries with Long Cycle Life

Yuqing Chen, Hongzhang Zhang,^{*} Wenbin Xu, Xiaofei Yang, Ying Yu, Xianfeng Li, and Huamin Zhang^{*}

The disproportionation of polysulfide (PS) is a long-neglected and vital issue that causes the fast capacity fading of Li–S batteries. Based on the hard and soft acids and bases (HSAB) theory, a large size *N*-methyl-*N*-ethyl pyrrolidinium (MEP⁺) cation is proposed to complex and stabilize the PS in electrolyte. The disproportionation of PS is successfully suppressed by this simple method, thereby avoiding the precipitation of sulfur in the electrolyte and reducing the loss of the active materials. The mutual interaction mechanism between MEP⁺ and S_n²⁻ in electrolyte is comprehensively investigated and verified for the first time, via both density functional theory (DFT) calculation and experimental characterization. It enables the 5000 mA h Li–S batteries (soft package type) to achieve initial specific energy over 300 Wh kg⁻¹ and maintain over 65% after 100 charge/discharge cycles at 1/20 C, while merely 24% is remained at 59 cycles without MEP⁺. This interesting finding is believed to shed light on the further development of Li–S batteries.

During the past 10 years, researchers focused their most efforts on solving the PS shuttle problem by developing multifunctional and/or multiarchitectural cathodes, separators, electrolytes and anodes.^[4] The most eye-catching and accepted result is LiNO₃ additive, which has been demonstrated that can effectively suppress PS shuttle via forming a stable solid electrolyte interphase (SEI) layer, resulting in prolonged cycling life as well as improved coulombic efficiency (close to 100%). However, another big issue of Li–S batteries, the PS disproportionation (Equation (1)), is still lack of effective solution^[5,6]



1. Introduction

Recently, Li–S batteries, with their high theoretical energy density (=2500 Wh kg⁻¹) and low cost, have aroused intense scholarly interest as one of the most promising next-generation power batteries for electric vehicles and portable electronic devices.^[1] However, the practical application of Li–S batteries is still hindered

Zhang and Kim et al. have already pointed out that PS disproportionation is the key reason for capacity attenuation of Li–S batteries.^[7] Once disproportionation occurs, the insoluble elemental sulfur or Li₂S_x (*x* < 3) will precipitate immediately, detach from the original conducting matrix, and become “dead sulfur.”^[8] Especially for the practical Li–S batteries with specific energy over 300 Wh kg⁻¹, where the PS concentration

Energy Storage

International Edition: DOI: 10.1002/anie.201708664
German Edition: DOI: 10.1002/ange.201708664

A Low-Cost Neutral Zinc–Iron Flow Battery with High Energy Density for Stationary Energy Storage

Congxin Xie, Yinqi Duan, Wenbin Xu, Huamin Zhang,* and Xianfeng Li*

Abstract: Flow batteries (FBs) are one of the most promising stationary energy-storage devices for storing renewable energy. However, commercial progress of FBs is limited by their high cost and low energy density. A neutral zinc–iron FB with very low cost and high energy density is presented. By using highly soluble $\text{FeCl}_2/\text{ZnBr}_2$ species, a charge energy density of 56.30 Wh L^{-1} can be achieved. DFT calculations demonstrated that glycine can combine with iron to suppress hydrolysis and crossover of $\text{Fe}^{3+}/\text{Fe}^{2+}$. The results indicated that an energy efficiency of 86.66% can be obtained at 40 mA cm^{-2} and the battery can run stably for more than 100 cycles. Furthermore, a low-cost porous membrane was employed to lower the capital cost to less than \$50 per kWh, which was the lowest value that has ever been reported. Combining the features of low cost, high energy density and high energy efficiency, the neutral zinc–iron FB is a promising candidate for stationary energy-storage applications.

With the increasing burdens of fossil energy shortage and environmental pollution, renewable energies such as solar and wind power become more and more important.^[1] However, the contradiction between a continual supply and the intermittent nature of the renewable energy source severely affected the energy output quality.^[2] Therefore, energy storage devices, especially large-scale energy storage devices, are in urgent need. A flow battery (FB) is one of the most promising technologies for large-scale energy storage owing

thus overcoming the intrinsic cross-contamination problem, and is now at the commercial demonstration stage.^[3] However, the low energy density (ca. 25 Wh kg^{-1}) and the relatively high cost (around \$600/kWh) hindered its further commercialization.^[1] To meet the cost target of less than \$150/kWh proposed by the Department of Energy (DOE) of the United States, seeking of new economical FB systems with high energy densities is highly desired.

Thus, various new flow-battery systems, with redox couples from aqueous to nonaqueous and from inorganic to organic, have been proposed and investigated. For the nonaqueous systems, the low solubilities of the redox couples and the extremely low ion conductivity of the electrolytes induce a low energy density as well as a low power density, even though they can provide a much wider voltage window.

As for the aqueous systems, the quinone bromine system showed a high power density.^[4] However, the corrosive nature of the Br_2 and the low electrolyte concentration and the low voltage (ca. 0.9 V) of the cell remained challenging issues. The alkaline quinone/Fe system showed an improved voltage,^[5] but the low solubility of $\text{K}_4\text{Fe}(\text{CN})_6$ (ca. 0.5 M) lead to relatively low energy density. Furthermore, a membrane with high stability and selectivity under an alkaline medium will result in a much higher cost. The polymeric TEMPO and viologen system demonstrated a negligible crossover of an inexpensive dialysis membrane instead of the ion-exchange membrane.^[6] However, the extra-low concentration of the

4. Nano Energy 2018, 02, 053

Nano Energy 47 (2018) 340–352

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Full paper

VSC-doping and VSU-doping of $\text{Na}_3\text{V}_{2-x}\text{Ti}_x(\text{PO}_4)_2\text{F}_3$ compounds for sodium ion battery cathodes: Analysis of electrochemical performance and kinetic propertiesHongming Yi^{a,b}, Moxiang Ling^{a,b}, Wenbin Xu^a, Xianfeng Li^{a,c}, Qiong Zheng^{a,*}, Huamin Zhang^{a,c,*}^a Division of Energy Storage, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Zhongshan Road 457, Dalian 116023, China^b University of Chinese Academy of Sciences, Beijing 100039, China^c Collaborative Innovation Center of Chemistry for Energy Materials (iCHEM), Dalian 116023, China

ARTICLE INFO

Keywords:
 $\text{Na}_3\text{V}_2(\text{PO}_4)_2\text{F}_3$
 Ti doping
 Electrochemical performance
 Kinetic properties
 Electron conduction
 Sodium ion diffusion

ABSTRACT

Ion doping strategy is employed to improve the rate performance of insulated $\text{Na}_3\text{V}_2(\text{PO}_4)_2\text{F}_3$ (NVPF) as cathode of sodium ion batteries. The concepts of VSU-doping (the valence state of the doping ion keeps unchanged during the synthesis) and VSC-doping (the valence state changes during the synthesis) have been introduced in this research. Titanium with different valence states (Ti^{2+} , Ti^{3+} , Ti^{4+}) is selected as the doping element to investigate the VSU-doping and VSC-doping effects on NVPF for the first time. Based on a series of characterizations, it is verified that a moderate Ti doping is able to effectively improve the rate performance of NVPF through the enhancing of electron conduction and sodium ion diffusion, and the advantage is more obvious for the VSC-doping samples. Among all the NVPF– Ti_x^{3+} ($x = 2, 3, 4$) samples, the NVPF– Ti_2^{3+} treated with a VSC-doping (Ti source: TiO) possesses the minimum particle size distribution (~40 nm), exhibits the highest initial specific capacity of 125 mA h g^{-1} at 0.2 C, and a very high rate capability (104 mA h g^{-1} at 40 C, 81 mA h g^{-1} at 80 C, 41 mA h g^{-1} at 200 C) as well, which has surpassed most of the reported results. When coupling with $\text{Na}_3\text{V}_2(\text{PO}_4)_3$ (NVP) as the anode, the NVPF– Ti_2^{3+} -NVP pseudo-symmetric full cell shows a high initial specific capacity of 99.6 mA h g^{-1} at 0.2 C and an outstanding rate capability (60% of initial specific capacity at 40 C). Subsequently, a detailed investigation on the effects of the VSU-doping and VSC-doping processes on the battery performance, in combination with DFT calculations and analysis of kinetic properties, has been conducted, especially from the perspective of electron conduction and sodium ion diffusion.