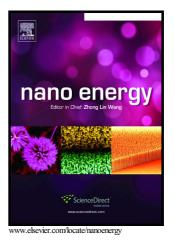
Author's Accepted Manuscript

Embellished Hollow Spherical Catalyst Boosting Activity and Durability for Oxygen Reduction Reaction

Pan Xu, Jing Zhang, Gaopeng Jiang, Fathy Hassan, Ja-Yeon Choi, Xiaogang Fu, Pouyan Zamani, Lijun Yang, Dustin Banham, Siyu Ye, Zhongwei Chen



 PII:
 S2211-2855(18)30519-6

 DOI:
 https://doi.org/10.1016/j.nanoen.2018.07.031

 Reference:
 NANOEN2898

To appear in: Nano Energy

Received date: 21 May 2018 Revised date: 12 July 2018 Accepted date: 13 July 2018

Cite this article as: Pan Xu, Jing Zhang, Gaopeng Jiang, Fathy Hassan, Ja-Yeon Choi, Xiaogang Fu, Pouyan Zamani, Lijun Yang, Dustin Banham, Siyu Ye and Zhongwei Chen, Embellished Hollow Spherical Catalyst Boosting Activity and Durability for Oxygen Reduction Reaction, *Nano Energy*, https://doi.org/10.1016/j.nanoen.2018.07.031

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Embellished Hollow Spherical Catalyst Boosting Activity and Durability for Oxygen Reduction Reaction

Pan Xu^{a,1}, Jing Zhang^{a,1}, Gaopeng Jiang^a, Fathy Hassan^a, Ja-Yeon Choi^{a,b}, Xiaogang Fu^a, Pouyan Zamani^a, Lijun Yang^b, Dustin Banham^b, Siyu Ye^b, Zhongwei Chen^{*a}

^aDepartment of Chemical Engineering, Waterloo Institute for Nanotechnology, University of Waterloo, 200 University Ave. W, Waterloo, ON, N2L 3G1, Canada

^bBallard Power Systems, 9000 Glenlyon Parkway, Burnaby, BC, V5J 5J8, Canada

*Corresponding author: E-mail: zhwchen@uwaterloo.ca

ABSTRACT

Transition metals hybridized to heteroatom doped carbon material can be regarded as the most promising non-noble candidate for boosting the sluggish kinetics of oxygen reduction reaction (ORR). However, it has always been a challenge to vastly boost the activity, and simultaneously retain a favorable structure from the supporting material. Herein, we prepared a high surface area hollow spherical carbon as a supporting material, and employed aminothiophenol (ATI) and poly-aminothiophenol (PATI) as heteroatom precursors to synthesize nitrogen and sulfur codoped catalysts, i.e. HCS-A and HCS-PA, respectively. The two catalysts possessed chemically similar surface composition, and nearly identical chemical states for each element. However, only HCS-A was able to vastly inherit both morphological advantage and high surface area from the carbon support. In further half-cell electrochemical testing, HCS-A performed better ORR activities and higher selectivity toward 4 electron pathway than HCS-PA in both acidic and

¹ The authors contributed equally to this work

Download English Version:

https://daneshyari.com/en/article/7952369

Download Persian Version:

https://daneshyari.com/article/7952369

Daneshyari.com