

## Accepted Manuscript

Three-dimensional porous ZnCo<sub>2</sub>O<sub>4</sub> sheet array coated with Ni(OH)<sub>2</sub> for high-performance asymmetric supercapacitor

Yu Pan, Hong Gao, Mingyi Zhang, Lu Li, Guangning Wang, Xinyuan Shan

PII: S0021-9797(17)30223-0  
DOI: <http://dx.doi.org/10.1016/j.jcis.2017.02.053>  
Reference: YJCIS 22080

To appear in: *Journal of Colloid and Interface Science*

Received Date: 22 January 2017  
Revised Date: 21 February 2017  
Accepted Date: 22 February 2017

Please cite this article as: Y. Pan, H. Gao, M. Zhang, L. Li, G. Wang, X. Shan, Three-dimensional porous ZnCo<sub>2</sub>O<sub>4</sub> sheet array coated with Ni(OH)<sub>2</sub> for high-performance asymmetric supercapacitor, *Journal of Colloid and Interface Science* (2017), doi: <http://dx.doi.org/10.1016/j.jcis.2017.02.053>

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 proof before it is published in its final 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.



# Three-dimensional porous ZnCo<sub>2</sub>O<sub>4</sub> sheet array coated with Ni(OH)<sub>2</sub> for high-performance asymmetric supercapacitor

Yu Pan<sup>1</sup>, Hong Gao<sup>1,\*</sup>, Mingyi Zhang<sup>1,2</sup>, Lu Li<sup>1</sup>, Guangning Wang<sup>1</sup>, and Xinyuan Shan<sup>1</sup>

*1 Key Laboratory for Photonic and Electronic Bandgap Materials, Ministry of Education, School of Physics and Electronic Engineering, Harbin Normal University, Harbin 150025, People's Republic of China.*

*2 Center for Advanced Optoelectronic Functional Materials Research, Key Laboratory of UV Light-Emitting Materials and Technology of Ministry of Education, Northeast Normal University, Changchun 130024, People's Republic of China.*

## Abstract

Hierarchical ZnCo<sub>2</sub>O<sub>4</sub>@Ni(OH)<sub>2</sub> sheet composite structures on Ni foam were rationally designed and successfully synthesized. The ZnCo<sub>2</sub>O<sub>4</sub> micro-sheets grown on Ni foam served as the skeleton to improve the electrical conductivity of redox active Ni(OH)<sub>2</sub> materials, providing more electroactive sites for the faradaic reaction, and solidify the Ni(OH)<sub>2</sub> materials onto Ni foam as a current collector. The electrode of ZnCo<sub>2</sub>O<sub>4</sub>@Ni(OH)<sub>2</sub> showed an ultrahigh areal capacitance of 4.6 F/cm<sup>2</sup> at a current density of 2 mA/cm<sup>2</sup>. A lightweight and small asymmetric supercapacitor (ASC) device was successfully fabricated using the ZnCo<sub>2</sub>O<sub>4</sub>@Ni(OH)<sub>2</sub> and carbonized filter paper (CFP) as positive and negative electrode, respectively. The ASC could work in a large potential window of 0-1.8 V and achieve a high energy density of 49 Wh/kg at 428 W/kg.

**Key Words:** Asymmetric supercapacitor; ZnCo<sub>2</sub>O<sub>4</sub>@Ni(OH)<sub>2</sub>; Composite electrode; High areal capacitance; High energy density

-----  
\*Corresponding author E-mails: gaohong65cn@126.com

Download English Version:

<https://daneshyari.com/en/article/4984815>

Download Persian Version:

<https://daneshyari.com/article/4984815>

[Daneshyari.com](https://daneshyari.com)