

## Accepted Manuscript

Design and synthesis of wool-like Co-Mg compound@NiMoO<sub>4</sub> nanosheet material for high performance supercapacitors

Yu Zhang, Wei-dong Xue, Huan Yin, Dong-xu He, Rui Zhao

PII: S1359-835X(17)30441-4

DOI: <https://doi.org/10.1016/j.compositesa.2017.12.007>

Reference: JCOMA 4856

To appear in: *Composites: Part A*

Received Date: 30 August 2017

Revised Date: 13 October 2017

Accepted Date: 6 December 2017

Please cite this article as: Zhang, Y., Xue, W-d., Yin, H., He, D-x., Zhao, R., Design and synthesis of wool-like Co-Mg compound@NiMoO<sub>4</sub> nanosheet material for high performance supercapacitors, *Composites: Part A* (2017), doi: <https://doi.org/10.1016/j.compositesa.2017.12.007>

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.



**Design and synthesis of wool-like Co-Mg compound@NiMoO<sub>4</sub> nanosheet material for high performance supercapacitors**

Yu Zhang, Wei-dong Xue, Huan Yin, Dong-xu He and Rui Zhao\*

Institute of Applied Electrochemistry, State Key Laboratory of Electronic Thin Films and Integrated Devices, Institute of Microelectronics & Solid State Electronics, University of Electronic Science and Technology of China, Chengdu 610054, P. R. China

**Abstract:** We have elaborated nanocomposite electrodes, which were designed and synthesized via facile hydrothermal with further annealing processes of NiMoO<sub>4</sub> nanosheets on cobalt and magnesium double hydroxide (DH) growing directly on Ni foam. The integrated electrode (the optimum hydrothermal time 6h) designed according to this structural pattern, had an excellent electrochemical performance along with a high areal-specific capacitance of 6.50 F cm<sup>-2</sup> at 5 mA cm<sup>-2</sup> and retained 56% at 60 mA cm<sup>-2</sup>, the capacitance of the electrode material remained 74% after 5000 cycles at 40 mA cm<sup>-2</sup>. The Co-Mg compound@NiMoO<sub>4</sub> and activated carbon were assembled into an asymmetric supercapacitor (Co-Mg compound@NiMoO<sub>4</sub>//AC), which allowed the feasible voltage could reach 1.6V and a high energy density of 57 Wh kg<sup>-1</sup> at the power density of 0.4 kW kg<sup>-1</sup>. The Co-Mg compound@NiMoO<sub>4</sub>//AC also showed significant cyclic stability with the capacitance retention of 87% after 5000 cycles.

**Key words:** transition metal oxides; nanocomposites; electrodes; supercapacitors

## 1. Introduction

Compared with fossil fuels, new energy sources are renewable and environmentally friendly, the development of new energy has become a potential solution for the energy crisis.[1-2] Supercapacitors, because of its high power density, fast charge and discharge rate and significant cycling life, have

---

\*Corresponding author: ruizhao@uestc.edu.cn

Download English Version:

<https://daneshyari.com/en/article/7889727>

Download Persian Version:

<https://daneshyari.com/article/7889727>

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