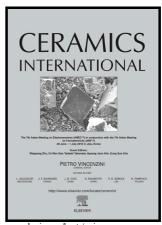
Author's Accepted Manuscript

Synthesis of nitrogen-doped reduced graphene oxide-multiwalled carbon nanotube composite on nickel foam as electrode for high-performance supercapacitor

Fook Yun Ban, Subramaniam Jayabal, Hong Ngee Lim, Hing Wah Lee, Nay Ming Huang



www.elsevier.com/locate/ceri

PII: S0272-8842(16)31150-6

http://dx.doi.org/10.1016/j.ceramint.2016.07.087 DOI:

CERI13312 Reference:

To appear in: Ceramics International

Received date: 25 April 2016 Revised date: 23 June 2016 Accepted date: 13 July 2016

Cite this article as: Fook Yun Ban, Subramaniam Jayabal, Hong Ngee Lim, Hing Wah Lee and Nay Ming Huang, Synthesis of nitrogen-doped reduced graphen oxide-multiwalled carbon nanotube composite on nickel foam as electrode fo high-performance supercapacitor, Ceramics International http://dx.doi.org/10.1016/j.ceramint.2016.07.087

This is a PDF file of an unedited manuscript that has been accepted fo publication. As a service to our customers we are providing this early version o 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

ACCEPTED MANUSCRIPT

Synthesis of nitrogen-doped reduced graphene oxide-multiwalled carbon nanotube composite on nickel foam as electrode for high-performance supercapacitor

Fook Yun Ban¹, Subramaniam Jayabal¹, Hong Ngee Lim², Hing Wah Lee³, Nay Ming Huang¹*

Abstract

An electrode with nitrogen-doped reduced graphene oxide/multiwall carbon nanotubes deposited on nickel foam (N-rGO/MWCNTs/NF) was successfully prepared using a simple one-pot hydrothermal method. The N-rGO/MWCNTs/NF composite was fabricated as an electrode for supercapacitor application. The supercapacitive performance of the N-rGO/MWCNTs/NF electrode was studied using electrochemical impedance spectroscopy, cyclic voltammetry, and galvanostatic charge/discharge in a 6 M KOH electrolyte solution. The N-rGO/MWCNTs/NF electrode showed an enhanced capacitance compared to rGO/MWCNTs/NF, N-rGO/NF, N-MWCNTs/NF, and bare NF electrodes because of nitrogen atom doping and more accessibility of the electrolyte after the incorporation of MWCNTs between the graphene sheets. The N-rGO/MWCNTs/NF electrode showed a specific capacitance of 142.08 F g⁻¹ at a current density of 1 A g⁻¹ and cycling stability with 76.2% of its initial capacitance after 1000 charge/discharge cycles.

Keywords: Nitrogen atom, reduced graphene oxide, multi-walled carbon nanotubes, nickel foam, supercapacitor.

¹Low Dimensional Materials Research Centre, Department of Physics, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia.

²Department of Chemistry, Faculty of Science & Functional Device Laboratory, Institute of Advanced Technology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

³Nanoelectronics Cluster, MIMOS Berhad, Technology Park Malaysia, Kuala Lumpur 57000,

Nanoelectronics Cluster, MIMOS Berhad, Technology Park Malaysia, Kuala Lumpur 57000 Malaysia.

^{*}Corresponding author E-mail: huangnayming@um.edu.my (Nay Ming Huang).

Download English Version:

https://daneshyari.com/en/article/5438104

Download Persian Version:

https://daneshyari.com/article/5438104

<u>Daneshyari.com</u>