

## Accepted Manuscript

Title: Conformal Coating of Cobalt-Nickel Layered Double Hydroxides Nanoflakes on Carbon Fibers for High-performance Electrochemical Energy Storage Supercapacitor Devices

Author: Muhammad Farooq Warsia Imran Shakir Muhammad Shahid Mansoor Sarfraz Muhammad Nadeem Zaheer Abbas Gilani

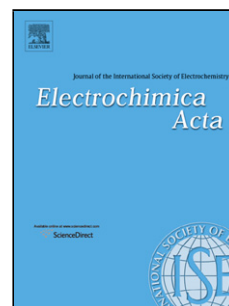
PII: S0013-4686(14)01001-9  
DOI: <http://dx.doi.org/doi:10.1016/j.electacta.2014.05.020>  
Reference: EA 22712

To appear in: *Electrochimica Acta*

Received date: 25-2-2014  
Revised date: 27-4-2014  
Accepted date: 5-5-2014

Please cite this article as: M.F. Warsia, I. Shakir, M. Shahid, M. Sarfraz, M. Nadeem, Z.A. Gilani, Conformal Coating of Cobalt-Nickel Layered Double Hydroxides Nanoflakes on Carbon Fibers for High-performance Electrochemical Energy Storage Supercapacitor Devices, *Electrochimica Acta* (2014), <http://dx.doi.org/10.1016/j.electacta.2014.05.020>

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.



# Conformal Coating of Cobalt-Nickel Layered Double Hydroxides Nanoflakes on Carbon Fibers for High-performance Electrochemical Energy Storage Supercapacitor Devices

Muhammad Farooq Warsi<sup>a</sup>, Imran Shakir<sup>b\*</sup>, Muhammad Shahid<sup>c</sup>, Mansoor Sarfraz<sup>b</sup>, Muhammad Nadeem<sup>d</sup>, and Zaheer Abbas Gilani<sup>e</sup>

<sup>a</sup>Department of Chemistry, The Islamia University of Bahawalpur, Bahawalpur-63100, Pakistan

<sup>b</sup>Deanship of scientific research, College of Engineering, King Saud University, PO-BOX 800, Riyadh.

<sup>c</sup>Material Science and Engineering, King Abdullah University of Science and Technology, Thuwal 23955-6900, Saudi Arabia

<sup>d</sup>Production chemistry department, Petroleum a Development Oman (PDO) LLC, Muscat-100, Sultanate of Oman.

<sup>e</sup>Department of Physics, Balochistan University of Information Technology, Engineering and Management Sciences, Quetta-87300, Pakistan

## Abstract

High specific capacitance coupled with the ease of large scale production is two desirable characteristics of a potential pseudo-supercapacitor material. In the current study, the uniform and conformal coating of nickel-cobalt layered double hydroxides (CoNi<sub>0.5</sub>LDH,) nanoflakes on fibrous carbon (FC) cloth has been achieved through cost-effective and scalable chemical precipitation method, followed by a simple heat treatment step. The conformally coated CoNi<sub>0.5</sub>LDH /FC electrode showed 1.5 times greater specific capacitance compared to the electrodes prepared by conventional non-conformal (drop casting) method of depositing CoNi<sub>0.5</sub>LDH powder on the carbon microfibers (1938 Fg<sup>-1</sup> vs 1292 Fg<sup>-1</sup>). Further comparison of conformally and non-conformally coated CoNi<sub>0.5</sub>LDH electrodes showed the rate capability of 79%: 43% capacity retention at 50 Ag<sup>-1</sup> and cycling stability

---

\* Corresponding author e-mail: [shakir@skku.edu](mailto:shakir@skku.edu)

Download English Version:

<https://daneshyari.com/en/article/6613663>

Download Persian Version:

<https://daneshyari.com/article/6613663>

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