

Accepted Manuscript

Silver nanowire doped active carbon thin film electrode by ultrasonic spray coating for high performance supercapacitor

Jung-Jie Huang, Yu-Lee Hsueh, Yu-Xuan Zhang



PII: S0257-8972(18)30423-7
DOI: doi:[10.1016/j.surfcoat.2018.04.053](https://doi.org/10.1016/j.surfcoat.2018.04.053)
Reference: SCT 23337
To appear in: *Surface & Coatings Technology*
Received date: 15 November 2017
Revised date: 6 April 2018
Accepted date: 17 April 2018

Please cite this article as: Jung-Jie Huang, Yu-Lee Hsueh, Yu-Xuan Zhang , Silver nanowire doped active carbon thin film electrode by ultrasonic spray coating for high performance supercapacitor. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Sct(2017), doi:[10.1016/j.surfcoat.2018.04.053](https://doi.org/10.1016/j.surfcoat.2018.04.053)

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.

Silver nanowire doped active carbon thin film electrode by ultrasonic spray coating for high performance supercapacitor

Jung-Jie Huang ^{a,*}, Yu-Lee Hsueh ^b, Yu-Xuan Zhang ^c

^a *Department of Electrical Engineering, Da-Yeh University, Changhua 515, Taiwan, R.O.C.*

^b *Graduate School of Engineering Science and Technology, National Yunlin University of Science and Technology, Yunlin 640, Taiwan, ROC.*

^c *Department of Electronic Engineering, National Yunlin University of Science and Technology, Yunlin 640, Taiwan, ROC.*

* Corresponding author. Tel.: +886 4 851 1888 ext. 2227

E-mail address: jjhuang@mail.dyu.edu.tw (J.-J. Huang)

Abstract

In this study, we used an active carbon doped with one-dimensional silver nanowires as an electrode paste for electric double-layer capacitors. Ultrasonic spray coating was used to fabricate thin-film electrodes. Unlike other studies, we only used active carbon as the base material and not doped conductive agents, such as carbon black, carbon nanotubes, and graphene. Using ultrasonic spray coating to deposit the electrode paste onto substrates increased the electrode specific surface area and pore volume, as well as enhanced ion adsorption–desorption, thereby achieving improved charge storage. In this experiment, we added various doping levels of silver nanowires to improve the capacitance of the supercapacitor. These results indicated that by doping 0.5 wt% silver nanowires onto the thin-film electrodes, the sheet resistance reduced significantly from 118.77 (undoped electrodes) to 35.10 $\text{k}\Omega\cdot\text{sq}^{-1}$, whereas the charge transfer resistance reduced by 35.7%. The electrochemical properties of the thin-film electrodes were tested using cyclic voltammetry, galvanostatic charge–discharge tests, and electrochemical impedance spectroscopy. The measured specific capacitance increased

Download English Version:

<https://daneshyari.com/en/article/8023275>

Download Persian Version:

<https://daneshyari.com/article/8023275>

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