

## Accepted Manuscript

Iron oxide/lignin-based hollow carbon nanofibers nanocomposite as an application electrode materials for supercapacitors

Boming Yu, Aori Gele, Linping Wang



PII: S0141-8130(18)31209-1

DOI: doi:[10.1016/j.ijbiomac.2018.06.088](https://doi.org/10.1016/j.ijbiomac.2018.06.088)

Reference: BIOMAC 9928

To appear in: *International Journal of Biological Macromolecules*

Received date: 13 March 2018

Revised date: 15 June 2018

Accepted date: 18 June 2018

Please cite this article as: Bomong Yu, Aori Gele, Linping Wang , Iron oxide/lignin-based hollow carbon nanofibers nanocomposite as an application electrode materials for supercapacitors. Biomac (2018), doi:[10.1016/j.ijbiomac.2018.06.088](https://doi.org/10.1016/j.ijbiomac.2018.06.088)

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.

# Iron oxide/lignin-based hollow carbon nanofibers nanocomposite as an application electrode materials for supercapacitors

Boming Yu, Aori gele\* and Linping Wang

State Key Laboratory of Pulp and Paper Engineering, South China University of Technology, Guangzhou, 510640, Guangdong, China

\*Corresponding author, Tel.: +8613424028286; E-mail: 13424028286@163.com

## Abstract

Iron oxide particle-decorated, hollow, carbon nanofibers (HCNFs), with poly(styrene-co-acrylonitrile) solution as the core and acetic acid lignin as the shell, were manufactured using a coaxial electrospinning technique, using iron(III) acetylacetonate as the iron oxide-precursor additive in the shell. The fabricated HCNFs exhibited a high specific capacitance of  $121 \text{ F}\cdot\text{g}^{-1}$  at  $0.5 \text{ A}\cdot\text{g}^{-1}$ , which was 2.18-fold that of solid electrospun nanofibers under the same conditions. The samples also possessed a superior cycling life, with a 90% retention rate after 1000 cycles in 1 M sodium sulfite. In this system, HCNFs exhibited high surface areas, as the result of hollow structures and producing capacitance improvement, while iron oxide particles enhanced electrochemical properties via reversible redox reactions. The attractive performances exhibited by these supercapacitors yielded them potentially promising candidates for future energy storage systems.

**Keywords:** lignin; carbon nanofiber; electrospinning; electrochemical

## 1. Introduction

Supercapacitors, also known as electrochemical capacitors, are novel

Download English Version:

<https://daneshyari.com/en/article/8326836>

Download Persian Version:

<https://daneshyari.com/article/8326836>

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