Accepted Manuscript

Title: Synthesis of porous carbon spheres derived from lignin through a facile method for high performance supercapacitors

Authors: Yuemei Chen, Guoxiong Zhang, Jingyuan Zhang, Haibo Guo, Xin Feng, Yigang Chen

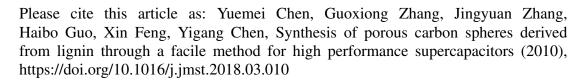
PII: S1005-0302(18)30072-0

DOI: https://doi.org/10.1016/j.jmst.2018.03.010

Reference: JMST 1218

To appear in:

Received date: 30-7-2017 Revised date: 4-11-2017 Accepted date: 30-12-2017



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.



ACCEPTED MANUSCRIPT

Synthesis of porous carbon spheres derived from lignin through a facile method for high performance supercapacitors

Yuemei Chen ¹, Guoxiong Zhang ¹, Jingyuan Zhang ¹, Haibo Guo ¹, Xin Feng ², Yigang Chen ^{1,*}

¹ Department of Electronic Information Materials, School of Materials Science and

Engineering, Shanghai University, Shanghai 200444, China

² Nano-Science & Technology Research Center, Shanghai University, Shanghai

200444, China

*Corresponding author. Tel.: +86 21 66132807; fax: +86 21 66132807.

E-mail address: yigangchen@shu.edu.cn (Y.G. Chen).

[Received 30 July 2017; revised 4 November 2017; accepted 30 December 2017]

Abstract

Porous carbon spheres (PCS) derived from lignin have been prepared through a facile method and fabricated as electrodes for electric double-layer capacitors. Spherical shaped mixtures of lignosulfonate and crystalized KOH are formed by spray drying of a solution of lignosulfonate and KOH. Activation by KOH is performed at high temperatures along with lignosulfonate carbonization. With an appropriate pore structure, the obtained PCS have a specific surface area of 1372.87 m² g⁻¹ and show a capacitance of 340 F g⁻¹ in 3 M KOH at a current density of 0.5 A g⁻¹. Moreover, a symmetric supercapacitor fabricated using the PCS as electrodes show a maximum capacitance of 68.5 F g⁻¹, and an energy density of 9.7 W h kg⁻¹ at a power density of 250 W kg⁻¹. The capacity retention is more than 94.5% after 5000 galvanostatic

Download English Version:

https://daneshyari.com/en/article/7951851

Download Persian Version:

https://daneshyari.com/article/7951851

<u>Daneshyari.com</u>