

Accepted Manuscript

Three-dimensional nitrogen-doped hierarchical porous carbon derived from cross-linked lignin derivatives for high performance supercapacitors

Wu Zhang, Chuying Yu, Libo Chang, Wenbin Zhong, Wantai Yang



PII: S0013-4686(18)31388-4

DOI: [10.1016/j.electacta.2018.06.100](https://doi.org/10.1016/j.electacta.2018.06.100)

Reference: EA 32093

To appear in: *Electrochimica Acta*

Received Date: 28 April 2018

Revised Date: 8 June 2018

Accepted Date: 13 June 2018

Please cite this article as: W. Zhang, C. Yu, L. Chang, W. Zhong, W. Yang, Three-dimensional nitrogen-doped hierarchical porous carbon derived from cross-linked lignin derivatives for high performance supercapacitors, *Electrochimica Acta* (2018), doi: 10.1016/j.electacta.2018.06.100.

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.

Three-dimensional nitrogen-doped hierarchical porous carbon derived from cross-linked lignin derivatives for high performance supercapacitors

Wu Zhang,^a Chuying Yu,^{*a} Libo Chang,^a Wenbin Zhong,^{*a} Wantai Yang^b

^a College of Materials Science and Engineering, Hunan University, Changsha, 410082, P. R. China.

^b Department of Polymer Science, Beijing University of Chemical Technology, Beijing, 100029, P. R. China.

* Corresponding author.

E-mail: yichuying@hnu.edu.cn (C. Yu); wzbzhong@hnu.edu.cn (W. Zhong)

Abstract

Nitrogen-doped hierarchical porous carbons are prepared by hydrothermal crosslinking reaction and KOH activation using sodium lignosulfonate as carbon precursor, 1,6-hexanediamine as crosslinking agent and nitrogen source. As-prepared nitrogen-doped hierarchical porous carbon possesses a high specific surface area ($1867.4 \text{ m}^2 \text{ g}^{-1}$), moderate nitrogen-doped content (3.6 at.%) and presents a superior three-dimensional hierarchical porous structure with rich micropores, favorable mesopores and interconnected macropores. The nitrogen-doped hierarchical porous carbon electrode performs high specific capacitance (440 F g^{-1} at 0.5 A g^{-1}) and excellent cycle stability (94.8% of its initial capacitance after 3000 cycles at 20 A g^{-1}) in a three-electrode workstation using 6 M KOH electrolyte, while it shows a superior

Download English Version:

<https://daneshyari.com/en/article/6602250>

Download Persian Version:

<https://daneshyari.com/article/6602250>

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