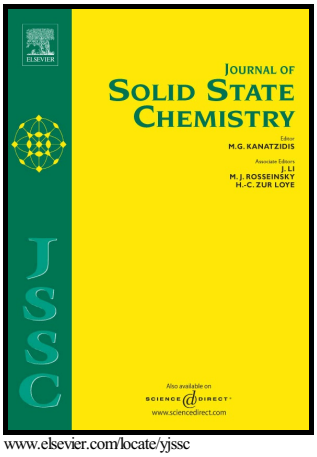

www.elsevier.com/locate/yjssc

Carbonization-dependent nitrogen-doped hollow porous carbon nanospheres synthesis and electrochemical study for Supercapacitors

Lingyun Zhou, Guohong Xie, Xiling Chen

PII: S0022-4596(18)30047-1
DOI: https://doi.org/10.1016/j.jssc.2018.02.001
Reference: YJSSC20105

To appear in: *Journal of Solid State Chemistry*

Received date: 19 November 2017
Revised date: 31 January 2018
Accepted date: 2 February 2018

Cite this article as: Lingyun Zhou, Guohong Xie and Xiling Chen, Carbonization-dependent nitrogen-doped hollow porous carbon nanospheres synthesis and electrochemical study for Supercapacitors, *Journal of Solid State Chemistry,* https://doi.org/10.1016/j.jssc.2018.02.001

Carbonization-dependent nitrogen-doped hollow porous carbon nanospheres synthesis and electrochemical study for Supercapacitors

Lingyun Zhou, Guohong Xie*, Xiling Chen

College of Resources and Environment，Henan Institute of Science and Technology，Xinxiang 453003，P. R. China

*Corresponding author. E-mail address: xieguohong@163.com (G. Xie).

Abstract

In this paper, a nitrogen-doped hollow microporous carbon nanospheres was synthesized via the combination of hyper-crosslinking mediated self-assembly and further pyrolysis using polylactide-b-polystyrene (PLA-b-PS) copolymers and aniline monomers as precursor. The pore structure and the correlative electrochemical performance of nitrogen-doped hollow microporous carbon nanospheres were affected by the molar mass ratio of aniline and PS in block copolymers and the carbonization conditions. The electrochemical measurements results showed that the obtained PLA_{150}-PS_{250}-N_4-900-10H sample with nitrogen content of 3.57% and the BET surface area of 945 m^2g^{-1} displays the best capacitance performance. At a current density of 1.0 Ag^{-1}, the resultant specific capacitance is 250 Fg^{-1}. In addition, it also exhibits high capacitance retention of ~98% after charging−discharging 1500 times at 25 Ag^{-1}. The results demonstrate the nitrogen-doped hollow microporous carbon nanospheres can be used as promising supercapacitor electrode materials for high performance energy storage devices.

Keywords

N-doped, hollow mesoporous, carbon nanospheres, supercapacitors

Introduction

Supercapacitors, as a strong material for energy storage, have attracted more and more attention due to their long cycle life, high cycle efficiency, fast charge/discharge rates