

Accepted Manuscript

Activated nitrogen-doped porous carbon ensemble on montmorillonite for high-performance supercapacitors

Wenwen Zhang, Zhenbo Ren, Zongrong Ying, Xindong Liu, Hui Wan



PII: S0925-8388(17)34531-0

DOI: [10.1016/j.jallcom.2017.12.327](https://doi.org/10.1016/j.jallcom.2017.12.327)

Reference: JALCOM 44413

To appear in: *Journal of Alloys and Compounds*

Received Date: 4 August 2017

Revised Date: 25 December 2017

Accepted Date: 27 December 2017

Please cite this article as: W. Zhang, Z. Ren, Z. Ying, X. Liu, H. Wan, Activated nitrogen-doped porous carbon ensemble on montmorillonite for high-performance supercapacitors, *Journal of Alloys and Compounds* (2018), doi: 10.1016/j.jallcom.2017.12.327.

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.

Activated Nitrogen-Doped Porous Carbon Ensemble on Montmorillonite for High-Performance Supercapacitors

Wenwen Zhang, Zhenbo Ren, Zongrong Ying*, Xindong Liu, Hui Wan

Department of Polymer Science and Engineering, School of Chemical Engineering, Nanjing

University of Science and Technology, Nanjing 210094, P.R. China

*Correspondence author: Zongrong Ying, Email: zrying@njust.edu.cn

Abstract: An activated nitrogen-doped porous carbon ensemble on montmorillonite (MMT) was prepared through hydrothermal carbonization of glucose on MMT followed by carbonization with melamine and activation with KOH at high temperatures. The carbonaceous species was effectively guided to be heterogeneously deposited onto the surface of MMT and inserted into the interlayer spacing. The resulting N-doped carbon composite has a unique microstructure, large specific surface area ($657 \text{ m}^2\cdot\text{g}^{-1}$), high nitrogen content (5.5 at%), maximum specific capacitance of $223 \text{ F}\cdot\text{g}^{-1}$ at a current density of $1 \text{ A}\cdot\text{g}^{-1}$ and an outstanding rate capability ($205 \text{ F}\cdot\text{g}^{-1}$ retained at $3 \text{ A}\cdot\text{g}^{-1}$) in a 6 M KOH aqueous electrolyte. Moreover, approximately 90% of the initial capacitance was retained after 8000 cycles at a current density of $1 \text{ A}\cdot\text{g}^{-1}$, suggesting an excellent cycling stability.

Keywords: Porous carbon; Montmorillonite; Activation; Nitrogen-doping; Supercapacitor

1. Introduction

Over the past decade, supercapacitors have attracted increasing attention due to their fast charge/discharge characteristics, high power density and long cycle life.

Download English Version:

<https://daneshyari.com/en/article/7993079>

Download Persian Version:

<https://daneshyari.com/article/7993079>

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