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

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.

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 $m^2 \cdot g^{-1}$), high nitrogen content (5.5 at%), maximum specific capacitance of 223 $F \cdot g^{-1}$ at a current density of 1 A g^{-1} and an outstanding rate capability (205 $F \cdot g^{-1}$ retained at 3 $A \cdot g^{-1}$) 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 $A \cdot g^{-1}$, 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.