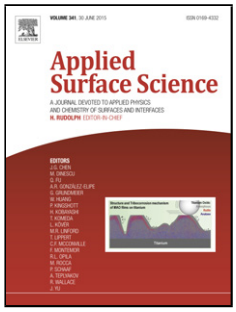

Title: Controlled synthesis of hierarchical birnessite-type MnO_2 nanoflowers for supercapacitor applications

Author: Shuoqing Zhao Tianmo Liu Dewen Hou Wen Zeng Bin Miao Shahid Hussain Xianghe Peng Muhammad Sufyan Javed

PII: S0169-4332(15)01834-6
DOI: http://dx.doi.org/doi:10.1016/j.apsusc.2015.08.037
Reference: APSUSC 30984

To appear in: *APSUSC*

Received date: 10-6-2015
Revised date: 2-8-2015
Accepted date: 6-8-2015

Please cite this article as: S. Zhao, T. Liu, D. Hou, W. Zeng, B. Miao, S. Hussain, X. Peng, M.S. Javed, Controlled synthesis of hierarchical birnessite-type MnO_2 nanoflowers for supercapacitor applications, *Applied Surface Science* (2015), http://dx.doi.org/10.1016/j.apsusc.2015.08.037

Controlled synthesis of hierarchical birnessite-type MnO_2 nanoflowers for supercapacitor applications

Shuoqing Zhao [a,b], Tianmo Liu [a,b,1], Dewen Hou [a,b], Wen Zeng [a,b] Bin Miao [a,b], Shahid Hussain [a,b], Xianghe Peng [a,b], Muhammad Sufyan Javed [c]

[a] College of Materials Science and Engineering, Chongqing University, Chongqing 400030, China

[b] National Engineering Research Center for Magnesium Alloys, Chongqing University, Chongqing 400030, China

[c] Department of Applied Physics, Chongqing University, Chongqing 400044, PR China

Abstract: Birnessite-type MnO_2 nanoflowers assembled by hierarchical nanosheets were successfully synthesized via a facile and simple hydrothermal process.The ration of reactants is a critical factor affects formation process of MnO_2 nanoflowers.The electrochemical test of the as-synthesized birnessite-type MnO_2 exhibits excellent electrochemical property with ideal voltammetry behavior, high specific capacitance (197.3 $F.g^{-1}$ at 1 $A.g^{-1}$) and superior cycling stability (only 5.4% capacitance loss after 1000 cycling test).The distinct hierarchical nanostructure and impressive electrochemical performances suggest the birnessite-type MnO_2 is a promising material for supercapacitor applications.

Keywords:

Hydrothermal; supercapacitor; birnessite-type MnO_2; nanoflower; specific capacitance

[1] Corresponding author. Tel.:+86 23 65102465; fax.:+86 23 65102465.
E-mail address: 18780107501@163.com (Shuoqing. Zhao); tmliu@cqu.edu.cn (Tianmo. Liu)