

# Accepted Manuscript

The shape effect of Manganese(II,III) oxide nanoparticles on the performance of electrochemical capacitors

Yinfeng Cheng, Zengyan Wei, Qing Du, Fangfang Liu, Xiaoming Duan, Yaming Wang, Dechang Jia, Yu Zhou, Baoqiang Li



PII: S0013-4686(18)31695-5

DOI: [10.1016/j.electacta.2018.07.177](https://doi.org/10.1016/j.electacta.2018.07.177)

Reference: EA 32374

To appear in: *Electrochimica Acta*

Received Date: 5 April 2018

Revised Date: 17 July 2018

Accepted Date: 23 July 2018

Please cite this article as: Y. Cheng, Z. Wei, Q. Du, F. Liu, X. Duan, Y. Wang, D. Jia, Y. Zhou, B. Li, The shape effect of Manganese(II,III) oxide nanoparticles on the performance of electrochemical capacitors, *Electrochimica Acta* (2018), doi: 10.1016/j.electacta.2018.07.177.

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.

## The Shape Effect of Manganese(II,III) Oxide Nanoparticles on the Performance of Electrochemical Capacitors

Yinfeng Cheng<sup>a,b</sup>, Zengyan Wei<sup>a,\*</sup>, Qing Du<sup>a</sup>, Fangfang Liu<sup>c</sup>, Xiaoming Duan<sup>a</sup>,  
Yaming Wang<sup>a</sup>, Dechang Jia<sup>a</sup>, Yu Zhou<sup>a</sup>, Baoqiang Li<sup>a,b,\*</sup>

<sup>a</sup> *Department of Materials Science and Institute for Advanced Ceramics, School of Material Science and Engineering, and MIIT Key Laboratory of Advanced Structural-Functional Integration Materials & Green Manufacturing Technology, Harbin Institute of Technology, Harbin 150001, PR China*

<sup>b</sup> *State Key Laboratory of Urban Water Resource and Environment, Harbin Institute of Technology, Harbin 150001, PR China*

<sup>c</sup> *School of Architecture, Harbin Institute of Technology, Harbin 150006, PR China*

\*Corresponding author: Zengyan Wei ([zwei@hit.edu.cn](mailto:zwei@hit.edu.cn)), Baoqiang Li ([libq@hit.edu.cn](mailto:libq@hit.edu.cn))

**Abstract:** Manganese(II,III) oxide ( $\text{Mn}_3\text{O}_4$ ) with various shapes including square prisms, polyhedra and tetragonal bipyramids are selectively synthesized with the mediation of fatty acids at nanoscale (<20 nm). Among all nanostructures,  $\text{Mn}_3\text{O}_4$  tetragonal bipyramids show the largest gravimetric capacitance of  $304 \text{ F g}^{-1}$  with excellent rate capability and long-term cycling stability. In contrast,  $\text{Mn}_3\text{O}_4$  polyhedra show relatively large intercalation capacity and poor stability, which could be related to the abundant low-coordination sites (edges, corners and defects) exposed on the surface. Transmission electron microscopy analysis reveals that the capacitance loss is

Download English Version:

<https://daneshyari.com/en/article/6601977>

Download Persian Version:

<https://daneshyari.com/article/6601977>

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