## Accepted Manuscript

Full Length Article

Alumina-coated and manganese monoxide embedded 3D carbon derived from avocado as high-performance anode for lithium-ion batteries

Wasif ur rehman, Youlong Xu, Xianfeng Du, Xiaofei Sun, Inam Ullah, Yuan Zhang, Yanling Jin, Baofeng Zhang, Xifei Li

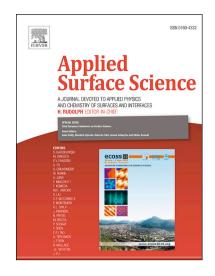
PII: S0169-4332(18)30786-4

DOI: https://doi.org/10.1016/j.apsusc.2018.03.112

Reference: APSUSC 38860

To appear in: Applied Surface Science

Received Date: 20 January 2018 Revised Date: 1 March 2018 Accepted Date: 13 March 2018



Please cite this article as: W. ur rehman, Y. Xu, X. Du, X. Sun, I. Ullah, Y. Zhang, Y. Jin, B. Zhang, X. Li, Alumina-coated and manganese monoxide embedded 3D carbon derived from avocado as high-performance anode for lithium-ion batteries, *Applied Surface Science* (2018), doi: https://doi.org/10.1016/j.apsusc.2018.03.112

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.

## **ACCEPTED MANUSCRIPT**

Alumina-coated and manganese monoxide embedded 3D carbon derived from avocado as high-performance anode for lithium-ion batteries

Wasif ur rehman<sup>a, b</sup>, Youlong Xu<sup>a, b,\*</sup>, Xianfeng Du<sup>a, b</sup>,Xiaofei Sun<sup>a, b</sup>, Inam Ullah<sup>a, b</sup>,Yuan Zhang<sup>a, b</sup>,Yanling Jin<sup>a, b</sup>,Baofeng Zhang<sup>a, b</sup>, Xifei Li<sup>c</sup>

<sup>a</sup>Electronic Material Research Laboratory, Key Laboratory of the Ministry of Education & International Center of Dielectric Research, Xi`an Jiaotong University, Xi`an 710049, China

<sup>b</sup>Shaanxi Engineering Research Center of Advance Energy Materials & Devices, Xi`an Jiaotong University, Xi`an 710049, China

<sup>c</sup>Institute of Advanced Electrochemical Energy, Xi`an University of Technology, Xi`an 710048, China

KEYWORDS: avocado fruit; 3D carbon; manganese oxide; alumina coating; anode; lithium-ion batteries

#### **ABSTRACT**

Derived from avocado fruit, a three dimension (3D) carbon is prepared *via* a hydrothermal/pyrolysis process followed by embedding with MnO nanoparticles by a wet chemical method and coating with Al<sub>2</sub>O<sub>3</sub> through an atomic layer deposition technique. The obtained material presents a hierarchical structure that MnO nanocrystalis wrapped in 3D carbon and then encapsulated in a uniform Al<sub>2</sub>O<sub>3</sub> layer with a thickness of about 5 nm. Benefiting from this hierarchical structure in which 3D carbon offers numerous electronic pathways to enhance the conductivity and Al<sub>2</sub>O<sub>3</sub> nanolayer provide a shelter to keep away from dissolution of Mn<sup>4+</sup> and

### Download English Version:

# https://daneshyari.com/en/article/7834281

Download Persian Version:

https://daneshyari.com/article/7834281

Daneshyari.com