

## Accepted Manuscript

Interconnected quasi-nanospheres of  $\text{SnO}_2/\text{TiO}_2/\text{C}$  with gap spaces for improved lithium storage

Dongmei Bao, Qinghua Tian

PII: S0167-577X(18)30967-4

DOI: <https://doi.org/10.1016/j.matlet.2018.06.062>

Reference: MLBLUE 24502

To appear in: *Materials Letters*

Received Date: 8 January 2018

Revised Date: 4 April 2018

Accepted Date: 18 June 2018



Please cite this article as: D. Bao, Q. Tian, Interconnected quasi-nanospheres of  $\text{SnO}_2/\text{TiO}_2/\text{C}$  with gap spaces for improved lithium storage, *Materials Letters* (2018), doi: <https://doi.org/10.1016/j.matlet.2018.06.062>

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.

# Interconnected quasi-nanospheres of SnO<sub>2</sub>/TiO<sub>2</sub>/C with gap spaces for improved lithium storage

Dongmei Bao<sup>a\*</sup> and Qinghua Tian<sup>b\*</sup>

<sup>a</sup>School of Chemical Engineering (School of Chinese Pharmacy), Guizhou Minzu University,  
Guiyang 550025, P. R. China

<sup>b</sup>School of Sciences, Zhejiang Sci-Tech University, Hangzhou 310018, P. R. China

\*Corresponding author e-mail address: dongtian1314521@163.com; 09tqinhua@163.com

**Abstract:** Herein, by combining the advantages of SnO<sub>2</sub>, TiO<sub>2</sub> and carbon elaborately, we present a stable nanostructure of SnO<sub>2</sub>-based composite. As a promising anode for lithium-ion batteries (LIBs), it delivers a high capacity of 642.5 mAh g<sup>-1</sup> after even 450 cycles, exhibiting outstanding lithium storage performance. This work provides a facile and effective method for addressing the undesirable volume variation issue of SnO<sub>2</sub> anodes.

**Keywords:** Crystal structure; Functional; Tin dioxide; Anode; Lithium-ion batteries

## 1. Introduction

Due to its high specific capacity and safe working potential, SnO<sub>2</sub> anode currently gains extensive attention. However, its practical application in lithium-ion batteries (LIBs) still suffers from a tremendous challenge [1]. The large volume variation of SnO<sub>2</sub> happened during cycling can easily cause the solid electrolyte interface (SEI) layer broken and expose the generated fresh surface of active materials to electrolyte, resulting in continuous growth of the SEI layer. Moreover, Sn nanoparticles derived from reduction of SnO<sub>2</sub> are easily aggregated to larger particles, which causes electrode fracture and loss of electrical contact during battery cycles [2, 3]. Taken together, severe capacity decay is often observed in SnO<sub>2</sub> electrodes [4]. Therefore, the fatal issues of large volume variation and aggregation need to be well addressed.

Download English Version:

<https://daneshyari.com/en/article/8012402>

Download Persian Version:

<https://daneshyari.com/article/8012402>

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