Author's Accepted Manuscript

www.elsevier.com

Simple fabrication of free-standing ZnO/graphene/carbon nanotube composite anode for lithium-ion batteries

Yongguang Zhang, Yaqiong Wei, Haipeng Li, Yan Zhao, Fuxing Yin, Xin Wang

PII: S0167-577X(16)31291-5
DOI: http://dx.doi.org/10.1016/j.matlet.2016.08.017
Reference: MLBLUE21301

To appear in: *Materials Letters*

Received date: 29 April 2016
Revised date: 19 July 2016
Accepted date: 4 August 2016

Cite this article as: Yongguang Zhang, Yaqiong Wei, Haipeng Li, Yan Zhao, Fuxing Yin and Xin Wang, Simple fabrication of free-standing ZnO/graphene/carbon nanotube composite anode for lithium-ion batteries *Materials Letters,* http://dx.doi.org/10.1016/j.matlet.2016.08.017

This is a PDF file of an unedited manuscript that has been accepted fo publication. As a service to our customers we are providing this early version o the manuscript. The manuscript will undergo copyediting, typesetting, an review of the resulting galley proof before it is published in its final citable form Please note that during the production process errors may be discovered whic could affect the content, and all legal disclaimers that apply to the journal pertain

ACCEPTED MANUSCRIPT

Simple fabrication of free-standing ZnO/graphene/carbon nanotube composite anode for lithium-ion batteries

Yongguang Zhang[1,2], Yaqiong Wei[1,2,3], Haipeng Li[1,2,3]*, Yan Zhao[1,2], Fuxing Yin[1,2], Xin Wang[4]*

[1]Research Institute for Energy Equipment Materials, Hebei University of Technology, Tianjin 300130, China

[2]Tianjin Key Laboratory of Laminating Fabrication and Interface Control Technology for Advanced Materials, Hebei University of Technology, Tianjin 300130, China

[3]School of Material Science & Engineering, Hebei University of Technology, Tianjin 300130 China

[4]Institute of Electronic Paper Displays, South China Academy of Advanced Optoelectronics, South China Normal University, Guangzhou, Guangdong Province, China

lihp_hebut@outlook.com

wangxin@scnu.edu.cn

*Corresponding author. Tel.: +86-22-60201447.

Accepted manuscript

Abstract

A three-dimensional ZnO/graphene/CNT (carbon nanotube) composite was prepared by a one-step sol-gel synthetic technique followed by vacuum-assisted filtration. High resolution transmission electron microscopy revealed the formation of highly-dispersed ZnO nanoparticles, uniformly laid on the crumpled graphene sheets and CNT. The as-prepared ZnO/graphene/CNT composite exhibited excellent cyclability and rate capability when used as anode for lithium ion batteries, affording 620 mAh g^{-1} stable reversible discharge capacity after 100 cycles at 100 mA g^{-1}. The unique composite structure provided a large surface area and highly conductive network which maintains good electronic contact between particles, suppresses ZnO aggregation during the charge/discharge processes, and accommodates the large volume changes of ZnO upon cycling.

Keywords: Lithium ion battery, Anode, ZnO/graphene/CNT composite, Free-standing, Nanoparticles,

Download English Version:

https://daneshyari.com/en/article/8016131

Download Persian Version:

https://daneshyari.com/article/8016131

Daneshyari.com