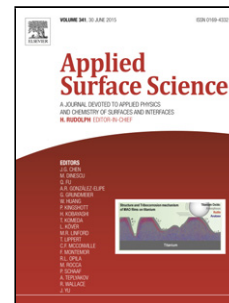


Accepted Manuscript

Title: One-step synthesis of 3D sulfur/nitrogen dual-doped graphene supported nano silicon as anode for Li-ion batteries

Authors: Ruihong Li, Junli Li, Kaiyu Qi, Xin Ge, Qiwei Zhang, Bangwen Zhang



PII: S0169-4332(17)32985-9
 DOI: <https://doi.org/10.1016/j.apsusc.2017.10.061>
 Reference: APSUSC 37404

To appear in: *APSUSC*

Received date: 21-7-2017

Revised date: 20-9-2017

Accepted date: 9-10-2017

Please cite this article as: Ruihong Li, Junli Li, Kaiyu Qi, Xin Ge, Qiwei Zhang, Bangwen Zhang, One-step synthesis of 3D sulfur/nitrogen dual-doped graphene supported nano silicon as anode for Li-ion batteries, Applied Surface Science <https://doi.org/10.1016/j.apsusc.2017.10.061>

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.

One-step synthesis of 3D sulfur/nitrogen dual-doped graphene supported nano silicon as anode for Li-ion batteries

Ruihong Li¹, Junli Li¹, Kaiyu Qi¹, Xin Ge¹, Qiwei, Zhang¹, Bangwen Zhang^{1,2*}

¹ School of Material and Metallurgy, Inner Mongolia University of Science & Technology, Baotou 014010, China

² Instrumental Analysis Center, Inner Mongolia University of Science & Technology, Baotou 014010, China

*** Corresponding authors.**

E-mail addresses: bangwenz@126.com (B.Zhang)

Highlights

- 3D SN-G/Si anode composite was synthesized by one-step hydrothermal method.
- The SN-G/Si composite anode exhibits high capacity, good cyclic and rate performance.
- The improvement is attributed to the 3D SN-G as the superior conductive skeleton and flexible loader with well-distributed Si nanoparticles.

Abstract:

Silicon is one of the most promising candidates for next-generation anode of Lithium-ion batteries. However, poor electrical conductivity and large volume change during alloying/dealloying hinder its practical use. Here we reported a three-dimensional (3D) nitrogen and sulfur codoped graphene supported silicon nanoparticles composite (SN-G/Si) through one-step hydrothermal self-assembly. The obtained SN-G/Si was investigated in term of instrumental characterizations and electrochemical properties. The results show that SN-G/Si as a freestanding anode in LIBs delivers a reversible capacity of 2020 mAh g⁻¹ after 100 cycles with coulombic efficiency of nearly 97%. The excellent electrochemical performance is associated with the unique structure and the synergistic effect of SN-G/Si, in which SN-G provides volume buffer for nano Si as the flexible loader, short paths /fast

Download English Version:

<https://daneshyari.com/en/article/7836380>

Download Persian Version:

<https://daneshyari.com/article/7836380>

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