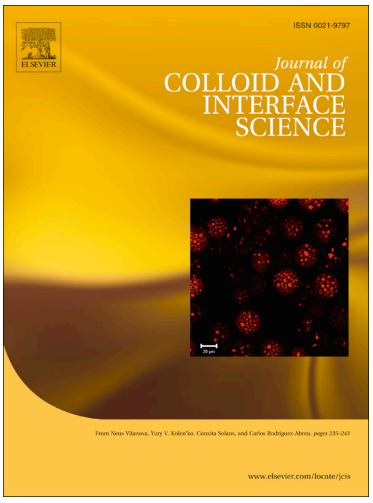

Regular Article

Facile preparation of hexagonal tin sulfide nanoplates anchored on graphene nanosheets for highly efficient sodium storage

Jiajia Ye, Lei Qi, Binbin Liu, Caixia Xu

PII: S0021-9797(17)31318-8
DOI: https://doi.org/10.1016/j.jcis.2017.11.025
Reference: YJCIS 23012

To appear in: *Journal of Colloid and Interface Science*

Received Date: 9 October 2017
Revised Date: 8 November 2017
Accepted Date: 8 November 2017

Please cite this article as: J. Ye, L. Qi, B. Liu, C. Xu, Facile preparation of hexagonal tin sulfide nanoplates anchored on graphene nanosheets for highly efficient sodium storage, *Journal of Colloid and Interface Science* (2017), doi: https://doi.org/10.1016/j.jcis.2017.11.025

Facile preparation of hexagonal tin sulfide nanoplates anchored on graphene nanosheets for highly efficient sodium storage

Jiajia Ye, Lei Qi, Binbin Liu, and Caixia Xu*

Institute for Advanced Interdisciplinary Research, Jinan 250022, China

Fax: +86-531-82765969; Tel: +86-531-89736103

E-mail: chm_xucx@ujn.edu.cn (C. Xu)

Abstract

Tin sulfide/graphene nanocomposite with hexagonal tin sulfide (SnS_2) nanoplates anchored on reduced graphene oxide (RGO) nanosheets was easily synthesized by one-step controllable hydrothermal growth followed by mild reduction. The SnS_2 hexagonal-plates distributed tightly and uniformly on the RGO support in a more favorable face-to-face (FTF) manner. The formation of SnS_2 nanoplates with hexagonal morphology may result from the accelerating growth of six energetically equivalent high-index (110) crystal planes and prohibiting growth of the (001) crystal plane on graphene. The FTF architecture is beneficial for the optimal electric contact efficiency of SnS_2 nanoplates with RGO matrix, thus leading to the greatly enhanced electrochemical performance of SnS_2/RGO composite than bare SnS_2. The graphene-constructed two-dimensional integrated conductive networks minimize the transport paths of electrons and Na ions between electrode and electrolyte as well as accommodate the mechanical strain during long term cyclic. The SnS_2/RGO composite exhibits great application potential as an anode for sodium ion batteries