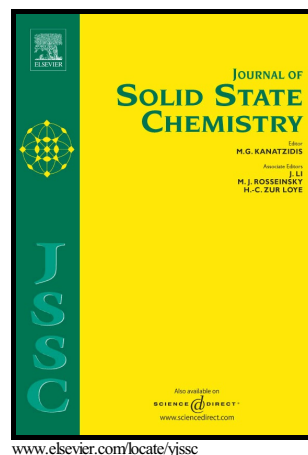


Author's Accepted Manuscript

Template-free synthesis of novel SnS₂ array and its superior performances for lithium ion battery

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PII: S0022-4596(18)30049-5
DOI: <https://doi.org/10.1016/j.jssc.2018.02.004>
Reference: YJSSC20108

To appear in: *Journal of Solid State Chemistry*

Received date: 8 January 2018
Revised date: 25 January 2018
Accepted date: 4 February 2018

Cite this article as: Anquan Zhu, Lulu Qiao, Pengfei Tan, Yongjin Ma, Yi Liu and Jun Pan, Template-free synthesis of novel SnS₂ array and its superior performances for lithium ion battery, *Journal of Solid State Chemistry*, <https://doi.org/10.1016/j.jssc.2018.02.004>

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**Template-free synthesis of novel SnS₂ array and its superior performances for
lithium ion battery**

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Abstract

A kind of novel three-dimensional SnS₂ array was fabricated by an ethylenediamine (EDA) assisting low-temperature solvothermal method. It was observed that as-obtained SnS₂ array was composed of numerous SnS₂ nanosheets with the thickness of about 22 nm. When used as lithium ion batteries (LIBs) anode, the SnS₂ array displayed remarkable performances on rate and cycling performances, delivering the rates with reversible capacities of 763.3, 658.6, 593.6, 554.4 and 450.3 mAh g⁻¹ at the current densities of 0.2, 0.5, 1, 2 and 5 A g⁻¹, respectively. Moreover, the satisfactory cycling performance was also disclosed, remaining capacity of 547.8 mAh g⁻¹ after 100th cycle at 0.2 A g⁻¹, better than some reported pure SnS₂ nanostructures. Based on the characterization and experimental results, the reasons of such superior electrochemical performances were determined and elaborated. It means that the SnS₂ array possesses promising potential on the renewable energy field.

Graphical abstract

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