Synthesis and Electrochemical Properties of $\text{Fe}_{1-x}\text{S}@C$ with Good Stability as an Anode Material for Lithium Ion Batteries

Yimeng Liao, Yanhui Zhang, Zhi Su*, Hualing Tian

College of Chemistry and Chemical Engineering, Xinjiang Normal University, Urumqi, 830054
Xinjiang, China

*E-mail: suzhixj@sina.com

doi: 10.20965/2019.11.53

Received: 28 March 2019 / Accepted: 4 May 2019 / Published: 7 October 2019

In this study, we use a rapid, convenient, and cost-effective precipitation method to synthesis $\text{Fe}_{1-x}\text{S}@C$ anode materials for use in lithium ion batteries (LIBs). We found that using a special carbon source acetylene black can lead to higher discharge specific capacity and a long cycling life of the LIB with $\text{Fe}_{1-x}\text{S}@C$ anode. The sample prepared with 10 wt% of the carbon source and calcined at 600 °C showed the best electrochemical performance. The optimum $\text{Fe}_{1-x}\text{S}@C$ sample maintained a very stable state after the initial 30 cycles of attenuation at 100 $\text{mA}\cdot\text{g}^{-1}$ and exhibited a high and stable reversible capacity of 644 $\text{mA}\cdot\text{h}\cdot\text{g}^{-1}$ until the 200th cycle.

Keywords: lithium-ion battery; anode material; $\text{Fe}_{1-x}\text{S}@C$; precipitation method; Electrochemical properties

[FULL TEXT](#)

© 2019 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).