Preparation of Core-shell Structure Carbon@SnM₂ (M=S, O) Microspheres Composites and Application in Lithium-ion Batteries

Ansong Wang¹, Penglin Zhang¹, Xiujuan Chen^{2,*} and Guoyun Yu¹

¹ State Key Laboratory of Advanced Processing and Recycling of Nonferrous Metals, Lanzhou University of Technology, Lanzhou 730050, China

² College of Mechano-Electronic Engineering, Lanzhou University of Technology, Lanzhou 730050, China

*E-mail: chenxj@lut.cn

doi: 10.20964/2019.04.46

Received: 4 January 2019 / Accepted: 31 January 2019 / Published: 10 March 2019

We report a fast solvothermal approach to fabricate the core-shell structure carbon@SnS₂ microspheres composites (C@SnS₂). And the same structured carbon@SnO₂ microspheres composites (C@SnO₂) were synthesized by calcinating of C@SnS₂ at 500°C in air. Then the phase structures and the morphologies of the carbon@SnM₂ (M=S, O) microspheres composites (C@SnM₂) were observed by X-ray diffraction analysis (XRD), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). The C@SnM₂ were composed of the uniform micron-sized carbon spheres with 1.5 μm as the core and SnM₂ with 200 nm as the shell. When putting it as the anode electrodes of lithium-ion batteries, the C@SnS₂ showed higher charge/discharge capacity, rate capability and cycling reversibility than C@SnO₂. Those excellent electrochemical performances make the C@SnS₂ to be a predominated candidate for the lithium-ion batteries.

Keywords: SnS₂; SnO₂; core-shell structure; anode materials; lithium-ion batteries.

[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/>).