Facile PSS-assisted Synthesis of SnO₂/Single-walled Carbon Nanohorn Composites for Supercapacitors

TaoTao Fan, Chenling Huang, Rong Chen, Jianping Xu, Chunyan Wang* Yong Qian*

Jiangxi Engineering Research Center of Process and Equipment for New Energy, East China University of Technology, Nanchang 330013, P.R. China

*E-mail: chywang9902@163.com, yqianecit@163.com

doi: 10.20964/2017.08.17

Received: 9 April 2017 / Accepted: 25 May 2017 / Published: 12 July 2017

In this study, we proposed an effective and rational method for *in situ* decoration of tin dioxide (SnO₂) nanoparticles on single-walled carbon nanohorns (SWNHs) by using poly (sodium 4-styrenesulfonate) (PSS) as dispersing agent and stabilizer. The morphology and nanostructure of SnO₂/SWNH composites were tested by TEM, XRD and XPS in detail. The results indicated that uniform dispersion of SnO₂ nanoparticles with mean size about 5nm on the SWNHs. The nanocomposites as electrode materials for high-performance supercapacitors were tested by cyclicvoltammetry (CV) and galvanostatic charge-discharge (GCD). Experimental results exhibited a high specific capacitance of 180.69 F/g at 1 A/g in 1 M Na₂SO₄ electrolyte. The SnO₂/SWNH composites showed good cycling stability, which the retention rate of the specific capacitance was 80.72% after 1200 times of charge and discharge cycles.

Keywords: Supercapacitor; SnO₂; SWNH; PSS-assisted synthesis

[FULL TEXT](#)

© 2017 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/>).