Hydrothermal Synthesis of TiO₂(B) Nanowires/CNTs as Anode Material for High Performance Lithium-ion Batteries

Rong Jiang, Xiaoxiao Luo, Xiaogang Wen*

School of Materials Science and Engineering, Sichuan University, Chengdu 610065, P. R. China

*E-mail: wenxg@scu.edu.cn

doi: 10.20964/2016.11.22

Received: 10 July 2016 / Accepted: 31 August 2016 / Published: 10 October 2016

A novel TiO₂(B) nanowires/carbon nanotubes (TNWs/CNTs) nanocomposite was designed and obtained via a simple hydrothermal reaction. The nanocomposites exhibit unique feature of TiO₂(B) nanowires twined with CNTs. The addition of CNTs can increase the electrolyte/electrode contact area and improve the electrical conductivity. Comparing with pure TNWs, the TNWs/CNTs nanocomposites have greatly improved rate capability, it demonstrate high capacity of 355.9, 291.4, 263.8, 235.7 and 191.3 mAh.g⁻¹, at current rate of 0.2, 0.5, 1, 2 and 5 C, respectively, and the capacity retention ratio is up to 90%. The results suggest the unique nanostructure and highly conductive carbon nanotubes induce excellent electrochemical performance of TNWs/CNTs nanocomposites, and make it a promising anode candidate for lithium-ion batteries (LIBs).

Keywords: TiO₂(B) nanowires; Carbon nanotubes; Hydrothermal synthesis; Lithium ion batteries.

[FULL TEXT](#)

© 2016 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/>).