Short Communication

Facile Synthesis of Nano-Si Modified Graphite Composite as Anode Material for Lithium Ion Batteries

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doi: 10.20964/2019.04.22

Received: 7 December 2018 / Accepted: 10 January 2019 / Published: 10 March 2019

We used a liquid-phase method to prepare a novel high capacity nano-Si modified graphite composite electrode material for lithium ion batteries. In this method, nano-Si powder was deposited onto the surface of natural spherical graphite using wet ball milling. CMC in solution was used as a binder between nano-Si and graphite and acted as a C coating in the sintering process. The acquired nano-Si modified graphite composite was investigated using X-ray diffraction (XRD), scanning electron microscopy (SEM). Electrochemical tests showed that the C coated nano-Si modified graphite composite had good electrochemical properties, such as high specific capacity, good rate capability and cycling performance and therefore was suitable for use in power or energy storage batteries. The 5 wt% nano-Si sample had a high specific capacity of 464.8 mAh g⁻¹ at 0.1 C rate, which was approximately 87.37 % of the theoretical specific capacity (~532 mAh g⁻¹).

Keywords: Nano-Si powder; Natural graphite; Composite; Liquid-phase; Carbon coating

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