Capacity Improvement of Tin-Deposited on Carbon-Coated Graphite Anode for Rechargeable Lithium Ion Batteries

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Sn nanoparticles (NPs) were dispersed on carbon-coated graphite (cG) substrate by the impregnation method using SnCl₂ as the precursor and NaBH₄ as the reducing agent. Sucrose was carbonized to form the coating layer on graphite. The amount of the amorphous carbon-coating layer on the graphite was measured by thermogravimetric analysis. The results of scanning electron microscopy, X-ray diffraction, and inductively coupled plasma atomic emission spectroscopy confirmed the deposition of Sn NPs on the graphite substrate. Sn-deposited materials were electrochemically characterized by charge-discharge cycling. Sn-deposited graphite (Sn/G) showed higher capacity than graphite, and Sn-deposited cG (Sn/cG) showed better electrochemical performance than Sn/G in terms of capacity, coulombic efficiency and cyclability.

Keywords: Rechargeable lithium-ion batteries, Sn nanoparticles, Carbon-coated graphite

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