Electrochemical Behaviors of SiO_x Nanoparticles as an Anode Material for Lithium-ion Battery

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Nano-sized SiOx nanoparticles were investigated as high capacity anode materials for lithium-ion batteries. High resolution transmission electron microscopy with x-ray diffraction analysis revealed that Si nanocrystals with the size of about 5 nm were well dispersed in amorphous SiO_x matrix after heat treatment at 1200 ℃ under inert atmosphere. The electrochemical performances of these materials showed a reversible capacity of 950 mAh/g with stable capacity retention during 50 cycles.

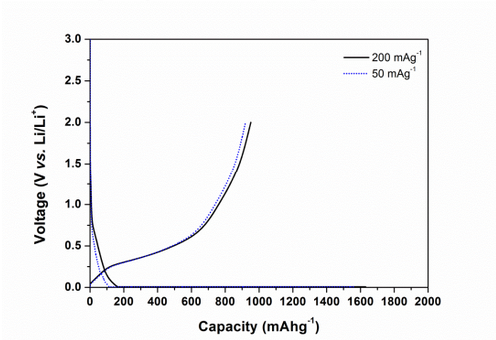

Fig.1. Charge and discharge curves of electrodes of the carbon-coated SiO_x nanoparticles in the first cycle.