Preparation of Mn₃O₄ Nanoparticles via Precipitation in Presence of CTAB Molecules and Its Application as Anode Material for Lithium Ion Batteries

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The Mn₃O₄ nanomaterials were widely investigated due to their potential application as anodes for lithium-ion batteries. Uniform Mn₃O₄ nanoparticles with a suitable diameter of 40 nm were designed and prepared by the water bath method to solve the low conductivity and the pulverization during cycling. The Mn₃O₄ nanoparticles electrodes exhibited an initial discharge capacity of 1288 mAh/g with an initial coulombic efficiency of 65% at 100 mA/g. At 200 mA/g, the reversible capacity increased to 1345 mAh/g after 190 cycles. The specific capacity increased to 547 mAh/g and 691 mAh/g when back to 200 mA/g and 100 mA/g, indicating the exceptional rate capability. The outstanding electrochemical performance of the Mn₃O₄ nanoparticles results from the suitable size of the nanoparticles and the increased conductivity during cycles. The Mn₃O₄ nanoparticles prepared with the water bath method have the potential application as anodes for lithium-ion batteries.

Keywords: Mn₃O₄ nanoparticles, Suitable size, Anodes, Lithium-ion batteries, Increased reversible capacity, Water bath.

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