A Facile and Eco-Friendly Approach to Synthesis of Spinel LiMn_2O_4 with High Electrochemical Performance

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LiMn_2O_4 cathode material have been prepared by sodium carbonate co-precipitation route and high temperature solid phase methods. The structural, morphological and electrochemical performance of LiMn_2O_4 were studied by X-ray diffraction, scanning electron microscope, galvanostatic testing, cyclic voltammetry and electrochemical impedance. The experimental results exhibited that LiMn_2O_4 prepared by sodium carbonate co-precipitation had a better performance. Its initial discharge capacities were 114.5, 82.1, 72.3 and 56.4 $\text{mAh}\cdot\text{g}^{-1}$ at the rates of 0.2, 2.0, 5.0 and 10 C, respectively. After 200 cycles, discharge capacity was 85.0 $\text{mAh}\cdot\text{g}^{-1}$ at a rate of 2.0 C with the capacity retention of 90.2%. It is concluded that sodium carbonate co-precipitation route is a promising method for synthesis of LiMn_2O_4 .

Keywords: LiMn_2O_4 ; Cathode material; co-precipitation; Electrochemical performance

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