Short Communication

Study on Preparation and Performance of $\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}\text{O}_2$ as cathode materials for lithium ion batteries

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Lithium ion battery has the advantages of high working voltage, good cycling performance and environmental friendliness. It is widely used in various battery energy storage devices. High nickel ternary positive electrode materials with $\alpha\text{-NaFeO}_2$ type layered crystal structure have become the focus of research in recent years due to their high energy density and good cycling performance. In this paper, $\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}\text{O}_2$ high-nickel ternary material was prepared by hydrothermal method, and the properties of the material were determined by phase analysis and electrochemical analysis. and the influence of sintering temperature on the morphology and structure and electrochemical performance of the ternary-type material was investigated. The results show that the optimal process conditions for the precursor mixed lithium sintering are divided into two steps: the first step is calcined at 500°C for 6h, and the second step is calcined at 800°C for 8h. Under these conditions, the $\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}\text{O}_2$ has the best morphology and the highest crystallinity, and has a specific capacity of $198.5\text{ mAh}\cdot\text{g}^{-1}$ at the rate of 0.2 C. After 100 charge and discharge cycles at 0.2 C, the capacity retention rate is still 96.7%.

Keywords: hydrothermal method; lithium ion battery; precursor; $\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}\text{O}_2$; cathode material.

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