Short Communication

Effects of Sintering Time on the Performance of $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ Synthesized by High Temperature Ball Milling Method

Ming Tian¹, Xuetian Li¹, Zhongbao Shao^{2,*}, Fengman Shen¹

¹ School of Metallurgy, Northeastern University, Shenyang 110819, PR China

² College of Science, Northeastern University, Shenyang 110819, PR China

*E-mail: shaozhongbao@mail.neu.edu.cn

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Composite material $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ cathode material for lithium-ion battery was obtained with lithium carbonate, nickel (II) oxide, cobalt (II, III) oxide and manganese dioxide as raw materials by high temperature ball milling method. To synthesis the $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ with excellent electrical properties, influence of ball-milling time was analyzed in this paper. Results showed that the best electrochemical performance of $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ was obtained from the test, $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ particles acquired ball-milling temperature at 750°C for 15h, and got performance uniformity of the material. Its initial discharge specific capacity reached 166.6 mAh/g at 0.1 C. The capacity of $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$ sample was 157.5 mAh/g, with a capacity retention rate of 94.5% over 50 cycles.

Keywords: Composite materials; $\text{LiNi}_{1/3}\text{Co}_{1/3}\text{Mn}_{1/3}\text{O}_2$; High temperature ball milling method; Electrical properties; Ball-milling time

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