Short Communication

Synthesis and Electrochemical Properties of Spinel-type $\text{Li}_4\text{Mn}_{5-x}\text{Ti}_x\text{O}_{12}$ Materials

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Cathode materials and anode materials are the focus of current research in lithium ions battery. In this study, $\text{Li}_4\text{Mn}_{5-x}\text{Ti}_x\text{O}_{12}$ ($x=0-5$) powders were prepared by a solid-state method, which calcined from 600°C to 800°C for 10 h. The chemical and physical properties of as-prepared powders had been characterized by XRD and SEM, and shown that the crystal phases of the powders crystallized to the spinel-type structure (Fd-3m). The discharge capacity and cycling performance of Ti-doped $\text{Li}_4\text{Mn}_{4.9}\text{Ti}_{0.1}\text{O}_{12}$ cathode material and of Mn-doped $\text{Li}_4\text{Ti}_{4.95}\text{Mn}_{0.05}\text{O}_{12}$ anode material had improved, from the electrochemical measurement. The reason may be due to the metal ions substitution help to stabilize the crystal structure during electrochemical insertion/extraction of Li^+ . We also discovered that $\text{Li}_4\text{Mn}_{2.5}\text{Ti}_{2.5}\text{O}_{12}$ material was not suitable as anode materials, but still suitable as cathode materials for lithium battery, although its discharge capacity very low.

Keywords: Li-ion batteries, $\text{Li}_4\text{Mn}_{5-x}\text{Ti}_x\text{O}_{12}$, anode material, cathode material, electrochemical propertie.

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