Short Communication

Preparation of $\text{Li}_4\text{Mn}_5\text{O}_{12}$ - Li_2MnO_3 1D Nanocomposite as Cathode for Lithium Ion Batteries

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The $\text{Li}_4\text{Mn}_5\text{O}_{12}$ - Li_2MnO_3 1D nanocomposite with 200~400nm diameter and 3~5 μm length have been synthesized by MnOOH nanorods and $\text{LiOH}\cdot\text{H}_2\text{O}$ via a solid state reaction process. The electrochemical properties and the mechanism were studied by the galvanostatic charging/discharging test and cyclic voltammograms (CV) test. The initial discharge capacity values were 111 $\text{mAh}\cdot\text{g}^{-1}$ at 0.5C rate and 88 $\text{mAh}\cdot\text{g}^{-1}$ at 1C rate observed in the range of 3.3–2.3V. Benefit from the one-dimension structure, high crystallinity and the existence of Li_2MnO_3 layer, the $\text{Li}_4\text{Mn}_5\text{O}_{12}$ - Li_2MnO_3 electrode exhibits excellent rate capability and cycling stability, with 92% and 99% capacity retention after 100 cycles at 0.5C and 1C rate, respectively.

Keywords: $\text{Li}_4\text{Mn}_5\text{O}_{12}$, Cathode materials, Electrochemical performance, Lithium-ion battery, 1D nanostructures

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