

عنوان مقاله:

Fabrication of NCM-graphene nanocomposite as the cathode material for use in Li-ion batteries

محل انتشار:

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خلاصه مقاله:

In this research, a nanocomposite comprising $\text{LiNi}_{0.33}\text{Co}_{0.33}\text{Mn}_{0.33}\text{O}_2$ (NCM) and reduced graphene oxide (RGO) was fabricated to be used as an improved cathode in a lithium-ion battery. The NCM cathode nanoparticles were synthesized by the solution combustion method using nitrate precursors. After combustion synthesis, the NCM material was heat-treated at $850\text{ }^\circ\text{C}$ for 15 h. The RGO was prepared using microwave-assisted reduction of graphene oxide (GO) suspension. The successful conversion of GO to RGO was investigated using the XRD and UV-vis techniques. The NCM/RGO nanocomposite was fabricated by a combined ultrasonic dispersion/ magnetic mixing method. The structures and morphologies of the NCM material and its graphene-based composite were investigated by the XRD, SEM and TEM analyses. Furthermore, evaluation of the electrochemical performance of the battery fabricated from NCM/RGO nanocomposite cathode showed an improved discharge capacity, rate capability, and cycling behavior of the Li-ion battery.

کلمات کلیدی:

Graphene, Nanocomposite, Cathode, Solution Combustion, Li-Ion Battery

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