Effect of Drying Time on Electrochemical Properties of $\text{Li}_{1.2}\text{Mn}_{0.54}\text{Ni}_{0.13}\text{Co}_{0.13}\text{O}_2$ Cathode Material

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Li-rich layered cathode materials were synthesized by the sol-gel method with acetate and citric acid. The effect of drying time on the structure, morphology and electrochemical properties of the prepared material were carefully studied with X-ray diffraction (XRD), scanning electron microscopy (SEM), cyclic voltammetry (CV), electrochemical impedance spectroscopy (EIS) and electrochemical characterization. The results show that the $\text{Li}_{1.2}\text{Mn}_{0.54}\text{Ni}_{0.13}\text{Co}_{0.13}\text{O}_2$ sample had a uniform particle size distribution and outstanding electrochemical performance at 24 h drying time. It delivered the largest initial discharge capacity of 262.5 mAh/g and coulombic efficiency of 77.66% at 0.1 C. Furthermore, it showed a high discharge capacity of 200.1 mAh/g and 158.9 mAh/g at 0.5 C and 2 C and a capacity retention of 80.46% and 84.14% after 100 cycles, respectively.

Keywords: Li-rich; Lithium-ion batteries; drying time; capacity retention

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