Effect of Ni and Cu Substitution on the Crystal Structure, Morphology and Electrochemical Performance of Spinel LiMn_2O_4

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Ni and Cu bi-metal doping of spinel LiMn_2O_4 materials are investigated by characterizing the as prepared materials by XRD, FTIR, SEM, TEM, CV, Charge/discharge measurements and electrochemical impedance spectroscopy (EIS). Although, Ni and Cu doping decreased the initial discharge capacity, the optimized composition such as $\text{LiNi}_{0.01}\text{Cu}_{0.01}\text{Mn}_{1.98}\text{O}_4$ demonstrates good capacity retention after prolonged charge/ discharge cycling and high rate capability. The observed enhanced electrochemical performance of Ni-Cu bi-metal doped samples may be attributed to the suppression of the structural changes along with improved lithium-ion kinetics during charge/ discharge process.

Keywords: Electrochemical performance; Metalsdoped Li-Ion Batteries;

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