

Structural and electrochemical characterization of $\text{Li}[\text{Ni}_x\text{Mn}_{1-x}]\text{O}_2$ ($x = 0.6, 0.7, 0.8$ and 1.0) as
Co-free cathode materials for lithium-ion batteries

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Cobalt-free layered cathode materials, $\text{Li}[\text{Ni}_x\text{Mn}_{1-x}]\text{O}_2$ ($x = 0.6, 0.7, 0.8$ and 1.0), were synthesized via co-precipitation method using 4 L CSTR (continuous stirred-tank reactor). The resultant materials were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM) and electrochemical charge-discharge method. With increasing Ni content, the reversible capacity increased with values of 150 mAh g^{-1} for $x = 0.6$, 163 mAh g^{-1} for $x = 0.7$, 183 mAh g^{-1} for $x = 0.8$ and 211 mAh g^{-1} for $x = 1.0$, while cyclability decreased resulting from a decrease of Mn content. The material with $x = 0.7$, $\text{LiNi}_{0.7}\text{Mn}_{0.3}\text{O}_2$, exhibited the best performance showing high reversible capacity and great cyclability.