**ABSTRACT**

Succinic acid assisted sol−gel synthesized layered LiNixCoyMn1−x−yO2 (0 ≤ x, y ≤ 0.5) materials have been studied as cathode materials for lithium rechargeable batteries. TG/DTA studies were performed on the gel precursor and suggest the formation of a layered phase around 400 °C. The gel precursor was calcined at 850 °C and characterized by means of X-ray diffraction and FT-IR analyses and reveals that all of the synthesized materials are found to be well-crystallized with an α-NaFeO2 layered structure. The effect of Co content on the surface morphology has been examined by scanning electron microscopy, and X-ray photoelectron spectroscopy studies indicate that the oxidation states of nickel, cobalt, and manganese are +2, +3, and +4, respectively. The electrochemical galvanostatic charge/discharge cycling behavior of the synthesized layered materials has been evaluated in the voltage range of 2.7–4.8 V at C/10 and C/5 rates. LiCo0.1Ni0.4Mn0.5O2 cathode material delivered the highest average discharge capacity of ~175 mAh/g at C/10 rate over the investigated 50 cycles