**ABSTRACT**

Layered mixed oxides LiNixCoyMn1−x−yO2 (0 ≤ x, y ≤ 0.5) synthesized by a sol–gel method using tartaric acid as a chelating agent, and their structural and electrochemical properties are investigated by thermal analysis, XRD, SEM, FT-IR and XPS studies. The higher composition of Co leads to cation disorder and shrinks the cell volume. Electrochemical behaviour of the synthesized materials is evaluated by Galvanostatic charge/discharge studies using 2016 type coin cells. The cycling studies are carried out in the voltage limits of 2.7 to 4.6, 4.8 and 4.9 V at current rates of C/10 and C/5 respectively. The composition LiNi0.4Co0.1Mn0.5O2 exhibits an average discharge capacity of 192 mA h g−1 at the current density of 0.612 mA cm−2 (C/5) in the voltage range of 2.7–4.9 V as compared to the discharge capacity of 155 and 175 mA h g−1 in the potential range of 2.7–4.6 and 2.7–4.8 V over the 50 investigated cycles. The effect of higher charge voltage at 4.9 V on the electrochemical performance of LiNixCoyMn1−x−yO2oxide materials has not previously been reported