**ABSTRACT**

Layered LiCuxCo1−xO2±δ (0.0 ≤ x ≤ 0.3) has been synthesized using microwave method. This method possesses many advantages such as homogeneity of final product and shorter reaction time compared to other conventional methods. The structure and electrochemical properties of the synthesized materials are characterized through various methods such as XRD, SEM, FTIR, XPS and galvanostatic charge/discharge studies. The XRD patterns of LiCuxCo1−xO2±δ confirm the formation of single-phase layered material. SEM images show that the particles are agglomerated and the average particle size decreases with increasing amount of copper. Electrochemical cycling studies are carried out between 2.7 and 4.6 V using 1 M LiPF6 in 1:1 EC/DEC as electrolyte. The charge/discharge cycling studies of layered material with LiCu0.2Co0.8O1.9 exhibit an average discharge capacity of ∼150 mAh g−1 over the investigated 50 cycles..