**ABSTRACT**

Layered LiMg0.1Co0.9O2 has been synthesized using microwave assisted solution technique. The precursorhas been subjected to thermo-gravimetric/differential thermal analysis (TG/DTA) and calcined at 850◦C.The precursor and the calcined powders were characterized by X-ray diffraction (XRD) to confirm theformation of single-phase layered material. Fourier transform infrared (FTIR) studies were carried out to understand the nature of the metal–ligand bond and the observations were consistent with the XRDspectrum. Scanning (SEM) and transmission electron microscope (TEM) images have been obtained tounderstand the surface morphology and the grain orientation of the synthesized material. Coin cells of2016 type have been assembled using the synthesized layered material as the cathode active material,lithium foil as the counter and reference electrodes and 1M LiPF6 in 1:1 EC/DEC as the electrolyte. Coincellswere assembled and crimp sealed inside an argon filled glove box. The charge/discharge characteristicsof the coin cellswere evaluated galvanostatically in the potential range 2.7–4.3 V. Results indicate thatLiMg0.1Co0.9O2 delivers an average discharge capacity of∼135mAhg−1 over the investigated 20 cycles andis a potential candidate for use as cathode material in lithium rechargeable cells