Supporting Information

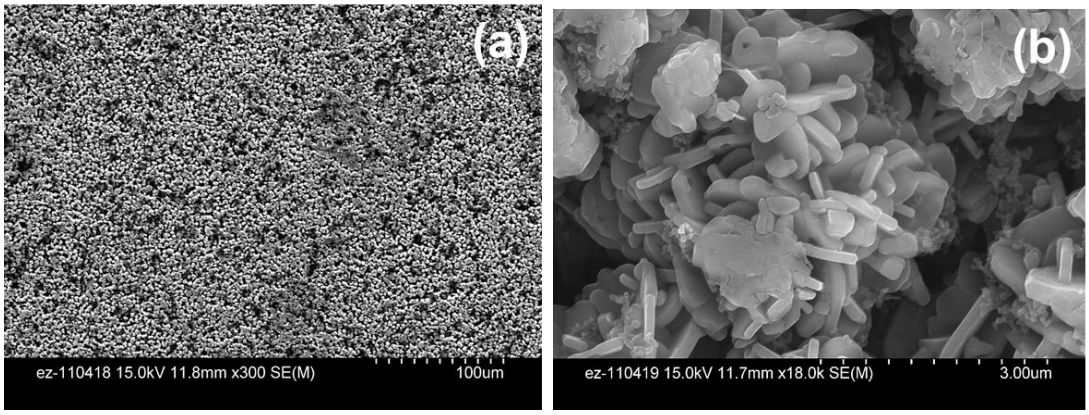

Figure S1: The SEM image of the pristine electrode $Li_{1.2}Co_{0.1}Mn_{0.55}Ni_{0.15}O_2$ electrode at low magnification (a) and high magnification (b).
The platelet morphology of the particle can be observed similar to lithium stoichiometric NMC material

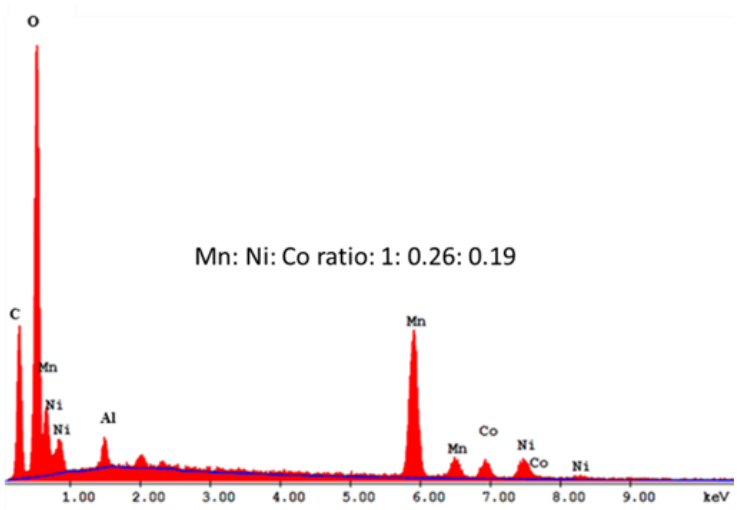

Figure S2: EDS spectrum collected from the pristine electrode. The Mn:Ni:Co ratio is 1:0.26:0.19 which is in agreement with the TM composition of electrode $Li_{1.2}Co_{0.1}Mn_{0.55}Ni_{0.15}O_2$.

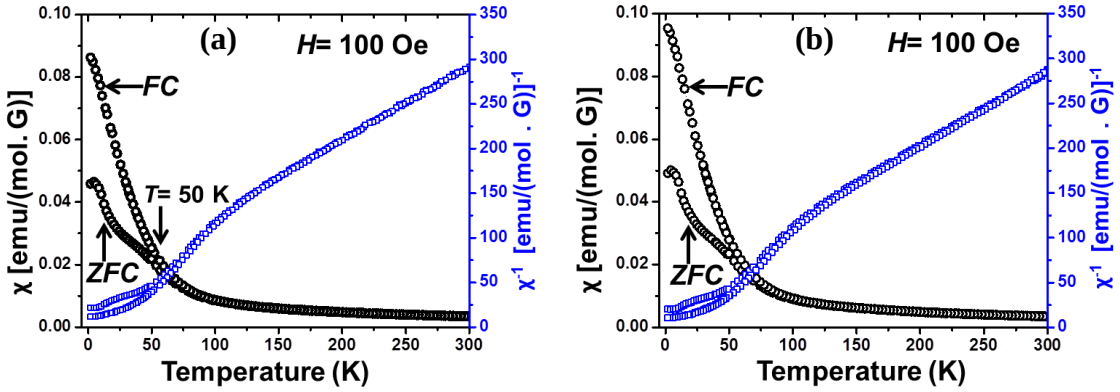

Figure S3: Magnetic susceptibility *vs*. temperature curves for electrode (a) and powder samples (b) show no difference in the trend.

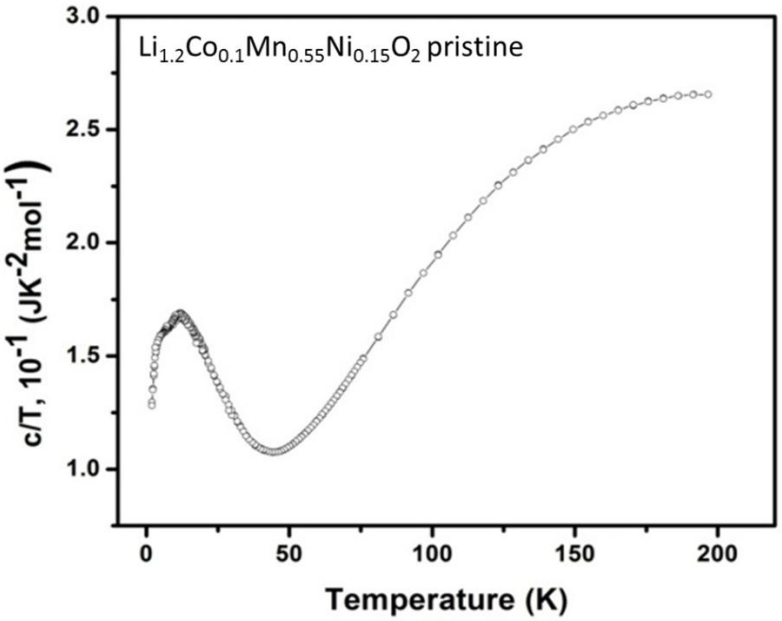

Figure S4: Heat capacity data of pristine $Li_{1.2}Co_{0.1}Mn_{0.55}Ni_{0.15}O_2$ shows λ-like feature indicating the magnetic transition occurs at T =50 K

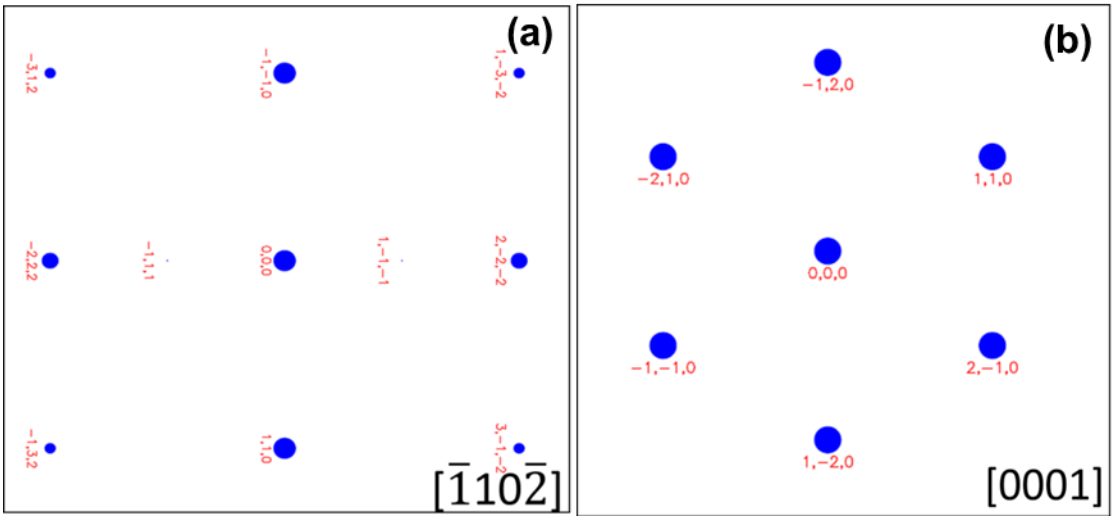

Figure S5: Simulated SAED pattern along [$\bar{1}10\bar{1}$] (a) and [0001] (b) zone axis of trigonal (O3) $R\bar{3}m$ unit cell.

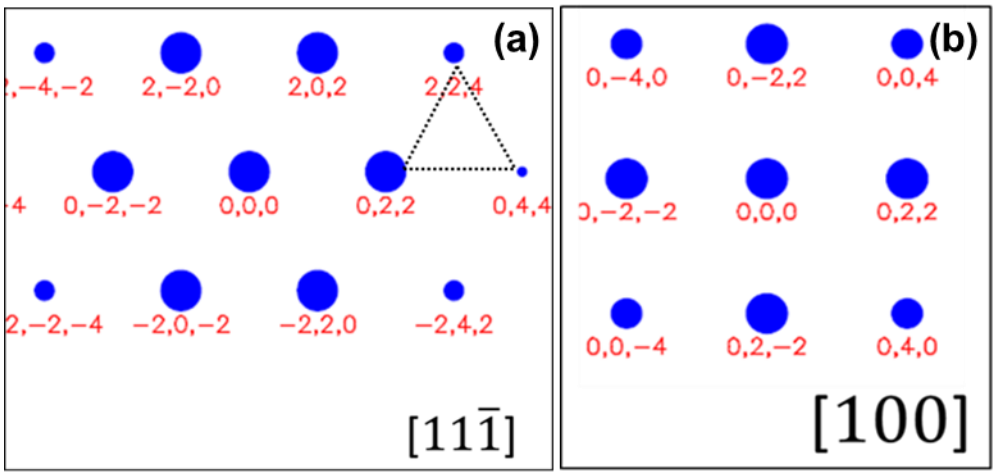

Figure S6: Simulated SAED pattern along [$11\bar{1}$] (a) and [100] (b) zone axis of spinel $Fd\bar{3}m$ unit cell.

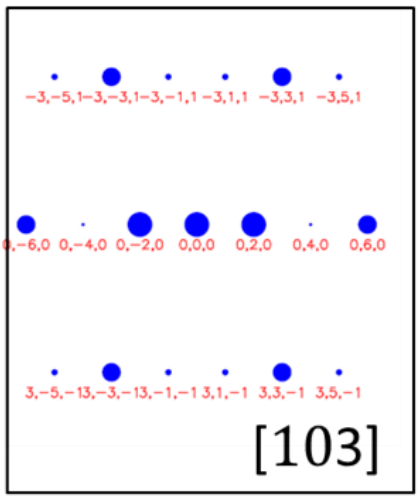

Figure S7: Simulated SAED pattern along [103] zone axis of monoclinic *C2/m* unit cell.