Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Supplementary information

Synthesis and enhanced electrochemical performance of 5 V, Li_2CoPO_4F cathodes under high current cycling

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Electrochemical performance of Li_2CoPO_4F cathodes with different electrolyte solutions

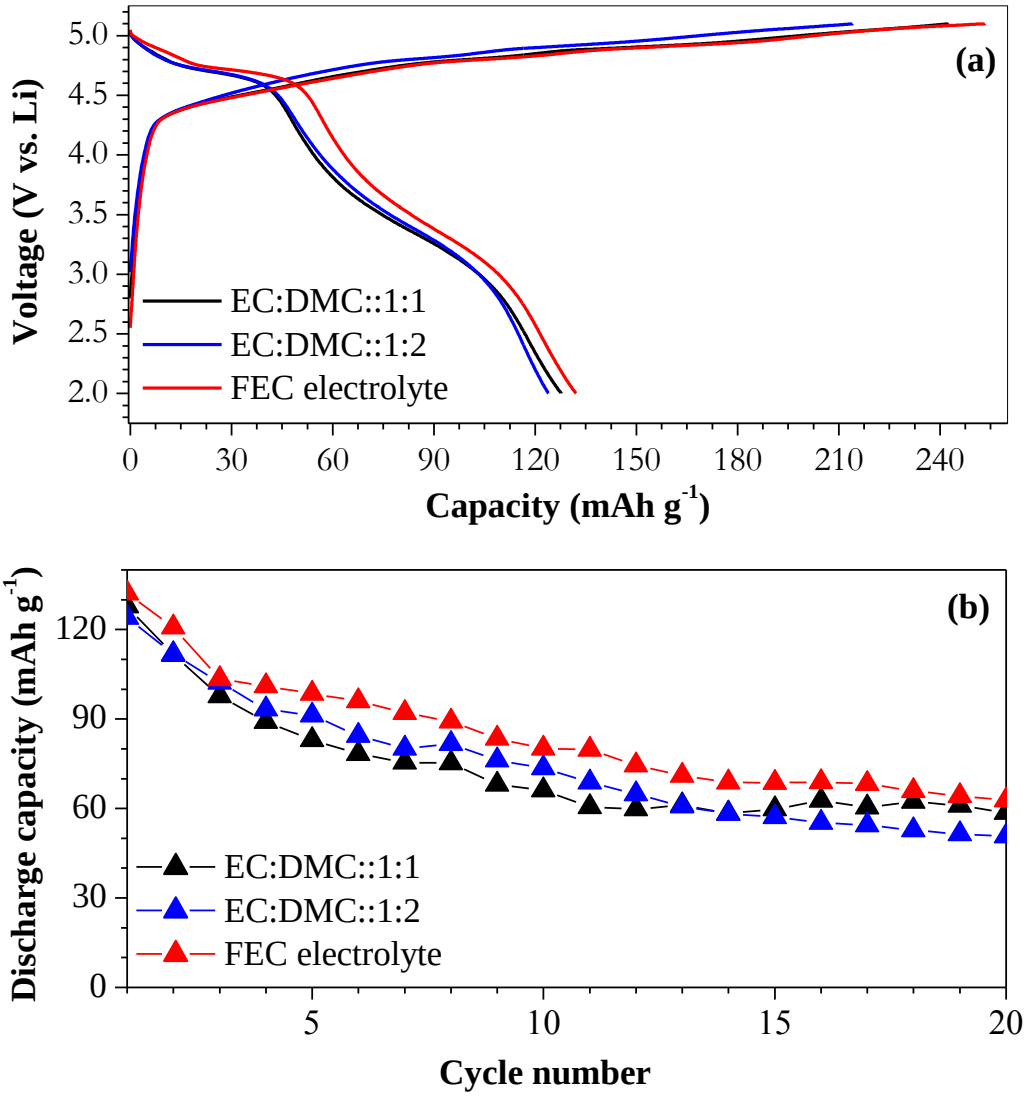

Figure S1: Initial charge-discharge curves (a) and cycle life studies (b) of Li_2CoPO_4F cathode active material synthesized at 700 °C

The electrochemical profiles of Li_2CoPO_4F (synthesized at 700 °C for 1.5 h) was evaluated with commercially available $LiPF_6$ based electrolyte solutions. More clearly, different ratios of solvents ethylene carbonate (EC) and dimethyl carbonate (DMC) likely 1:1 and 1:2 by volume were used and compared with fluoro-ethylene carbonate (FEC) additive. Hereafter, those electrolytes were named for convenience as DMC1 (1:1 ratio) and DMC2 (1:1 ratio), respectively. The half-cells

were assembled according to the procedure described in the experimental section for FEC additive. Galvanostatic cycling studies were conducted between 2 -5.1 V *vs.* Li at constant current rate of C/12 and given in figure S1. Li/Li_2CoPO_4F cell exhibited the similar kind of discharge curves, irrespective of the electrolyte. Test cell delivered the discharge capacity of 127, 123 and 132 mAh g^{-1} for DMC1, DMC2 and FEC additive, respectively. After 20 cycles, capacity retention of 41, 46 and 49% is noted for DMC1, DMC2 and FEC additive based electrolytes, respectively.