Supporting Information

Highly fluorinated co-solvent enabling ether electrolyte for high-voltage lithium ion batteries with graphite anode

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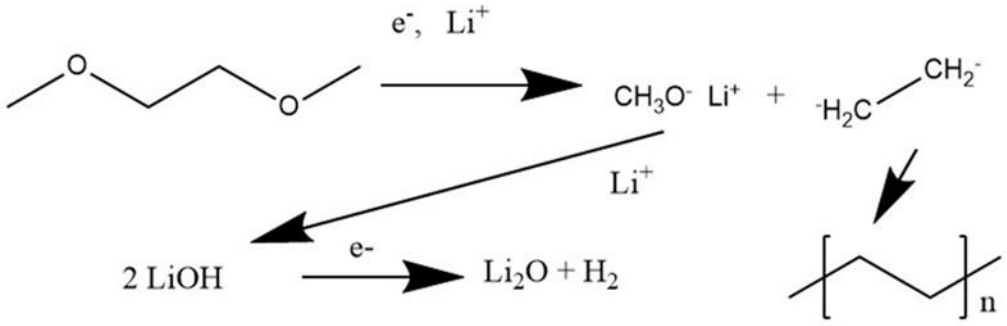

Scheme S1. Proposed mechanism of H_2 formation.

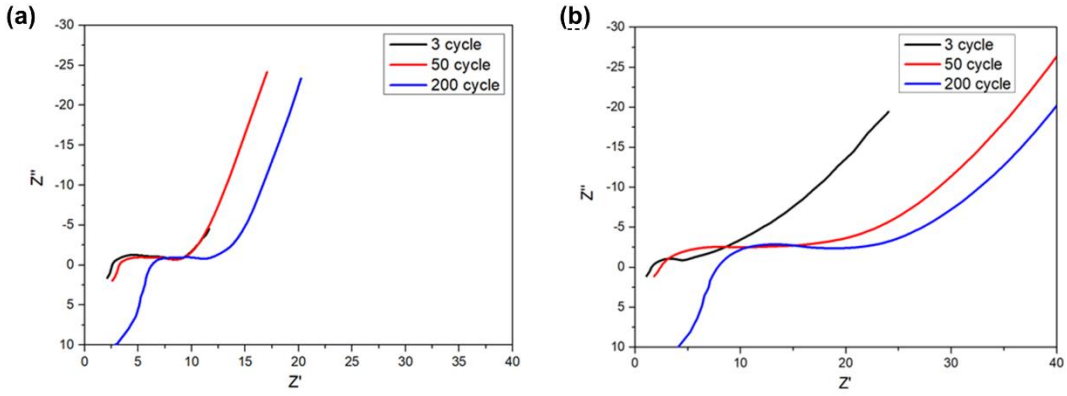

Figure S1. Nyquist plots of Li||graphite cells after different cycle numbers with (a) fluorinated ether and (b) conventional ether electrolytes.

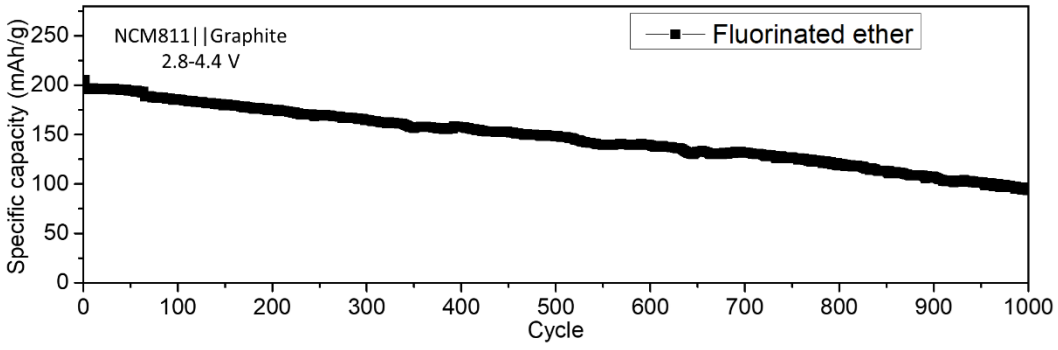

Figure S2. Cycling performance of NCM811||graphite full cell with fluorinated ether electrolyte for 1,000 cycles.

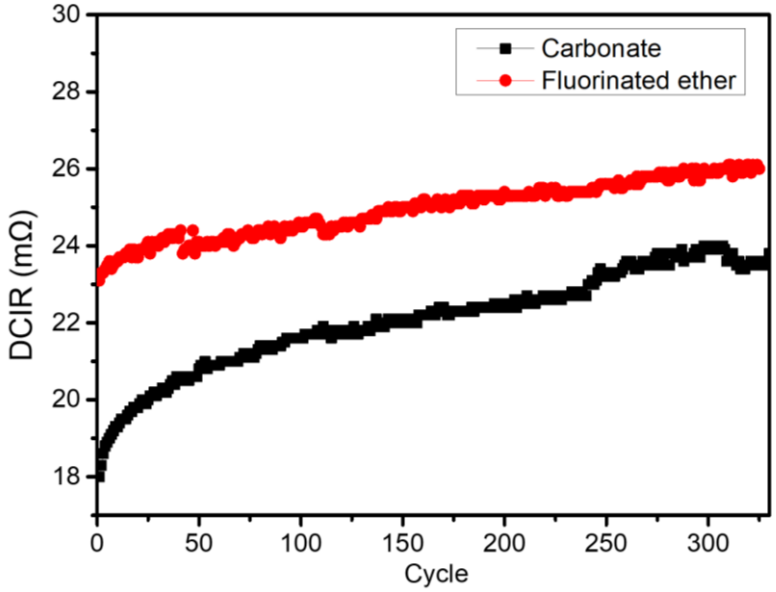

Figure S3. Discharge direct current internal resistance (DCIR) of NCM811||graphite pouch cells with different electrolytes at 45ºC.

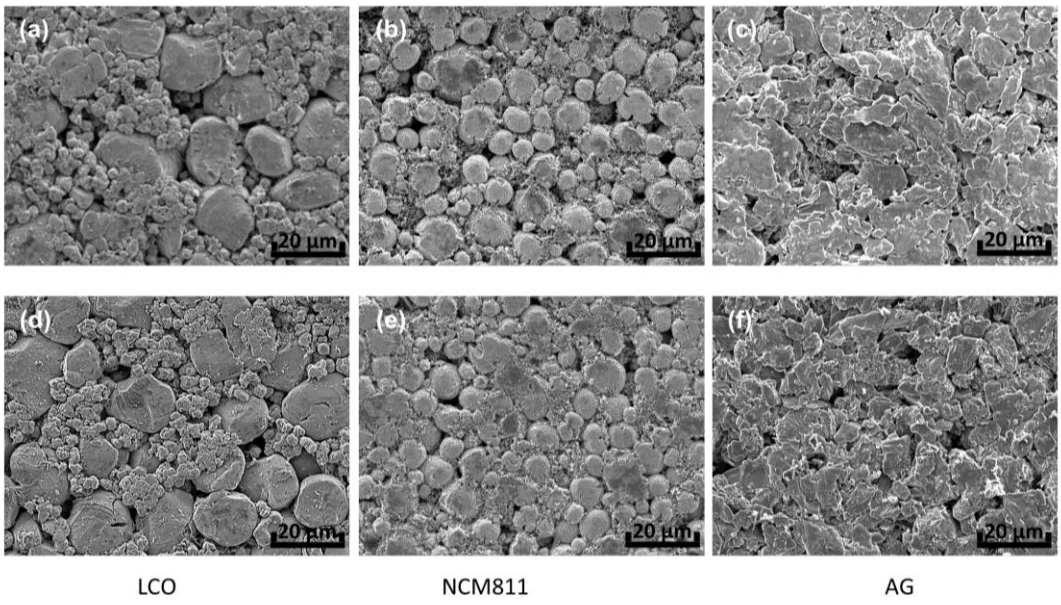

Figure S4. SEM images of cycled electrodes after 100 cycles: (a) LCO, (b) NCM811

and (c) graphite using fluorinated ether electrolyte; (d) LCO, (e) NCM811 and (f) graphite using carbonate electrolyte.

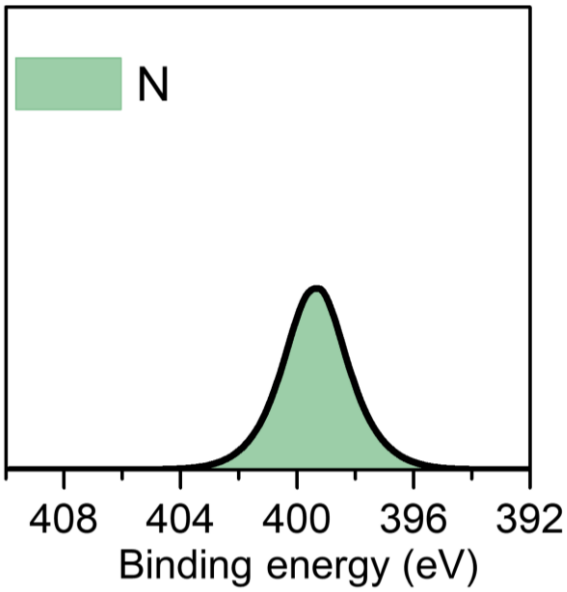

Figure S5. N 1s XPS spectrum of graphite electrode after 100 cycles with fluorinated ether electrolyte.

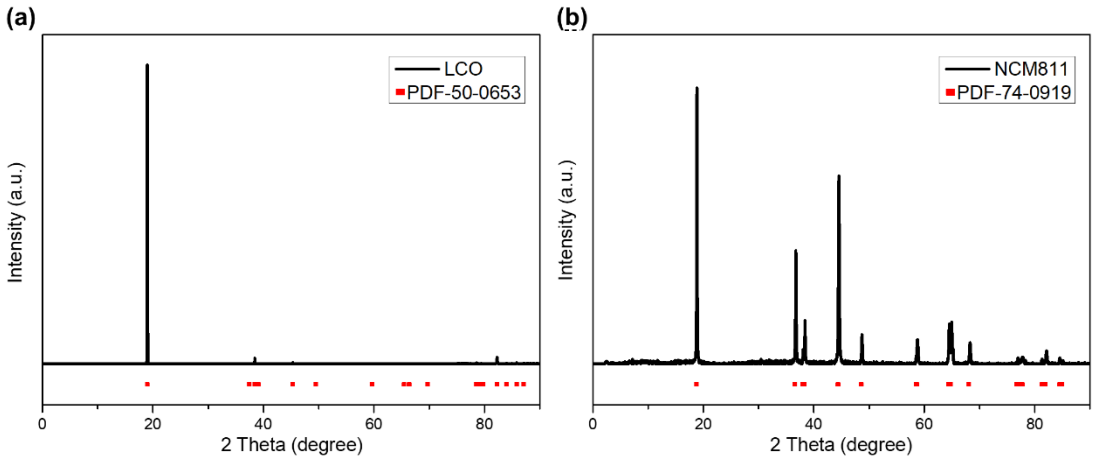

Figure S6. X-ray diffraction (XRD) patterns of (a) $LiCoO_2$ (LCO) and (b) $LiNi_{0.8}Co_{0.1}Mn_{0.1}O_2$ (NCM811).