Supplementary Information for

In situ generation of soft-tough asymmetric composite electrolyte for dendrite-free lithium metal batteries

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Supplementary Figures

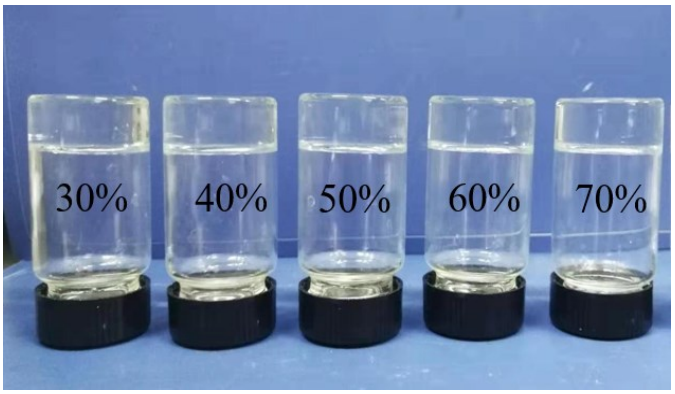

Fig. S1 Photo of TPGDA with varied amounts of LE after the polymerization process.

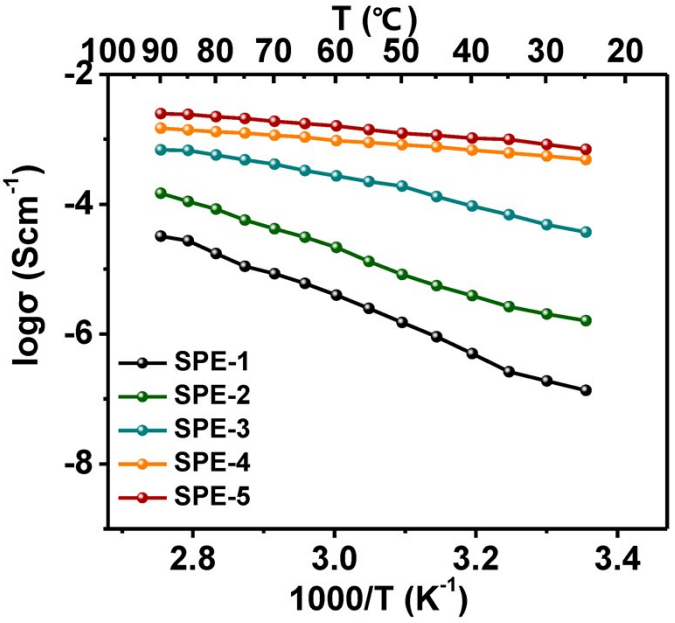

Fig. S2 The ionic conductivity of the SPE with different content of LE.

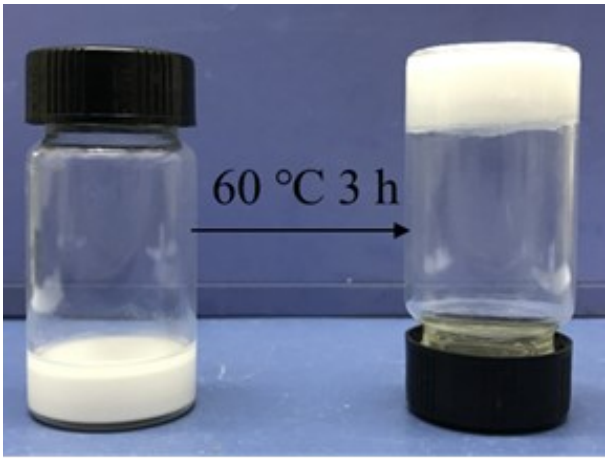

Fig. S3 The typical image of composite electrolyte precursor solution before and after heating at 60 °C for 3 h.

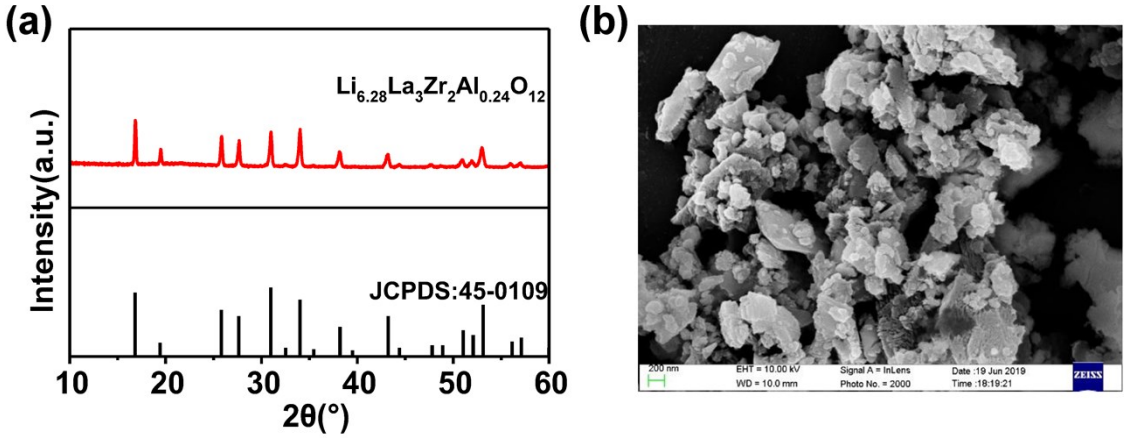

Fig. S4 (a) XRD pattern and (b) SEM image of the LLZAO powders.

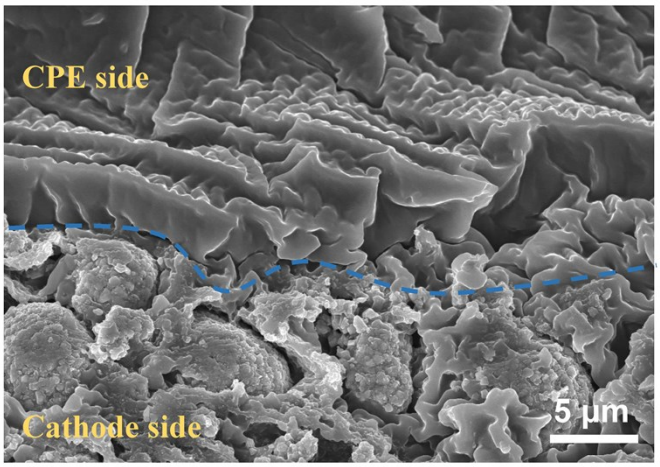

Fig. S5 SEM cross-section image of the CPE and NCM cathode layer interface.

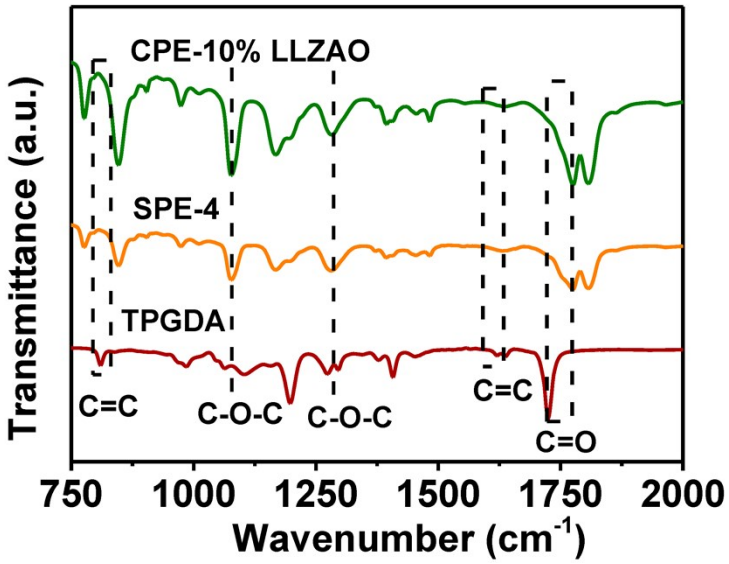

Fig. S6 FTIR adsorption spectra of TPGDA, SPE-4, and CPE-10%LLZAO.

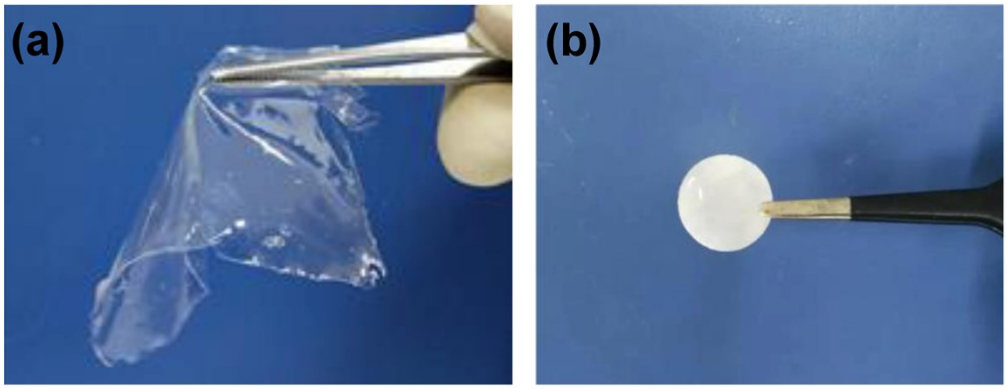

Fig. S7 The digital images of (a) TPGDA polymer electrolyte (b) CPE-10%LLZAO electrolyte.

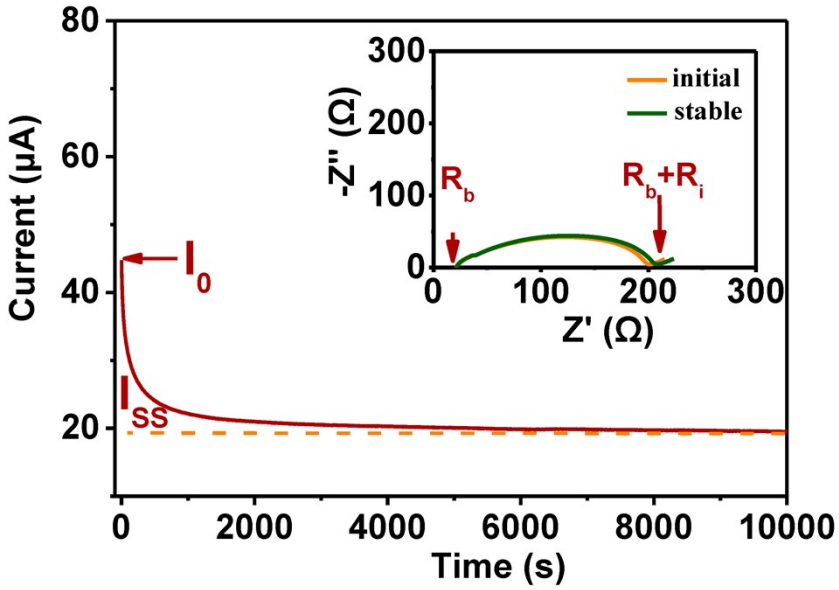

Fig. S8 Current variation with time of a symmetrical Li/SPE-4/Li cell.

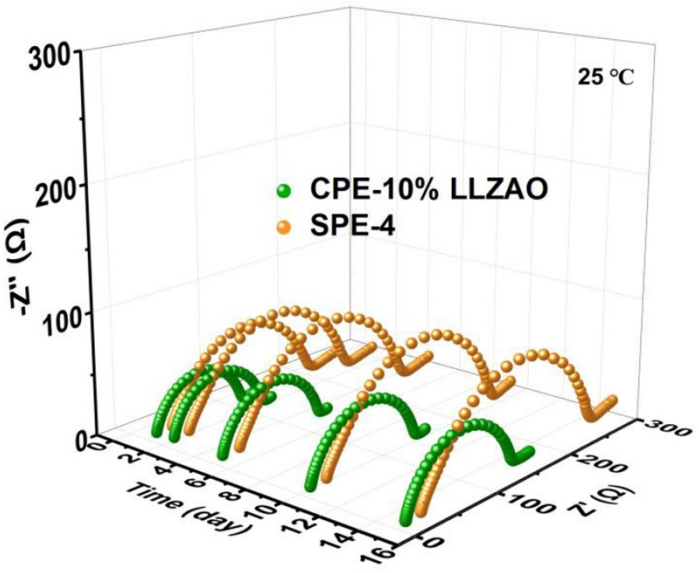

Fig. S9 Impedance response with time evolution of the Li/CPE-10%LLZAO/Li and Li/SPE-4/Li.

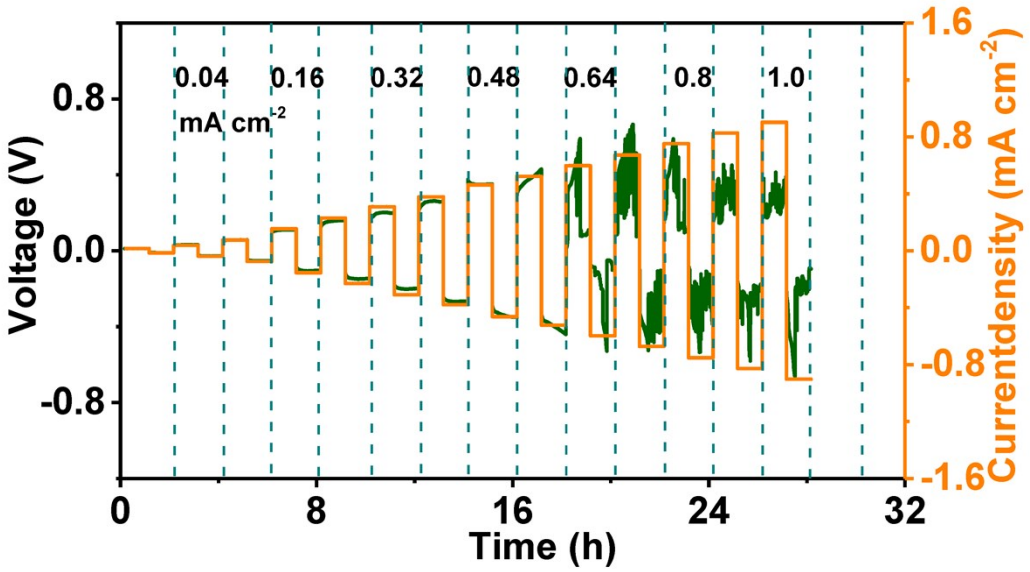

Fig. S10 Direct current cycling of Li/CPE-10%LLZAO/Li symmetrical cell, stepping the current density from 0.02 to 1.0 mA cm^{-2}.

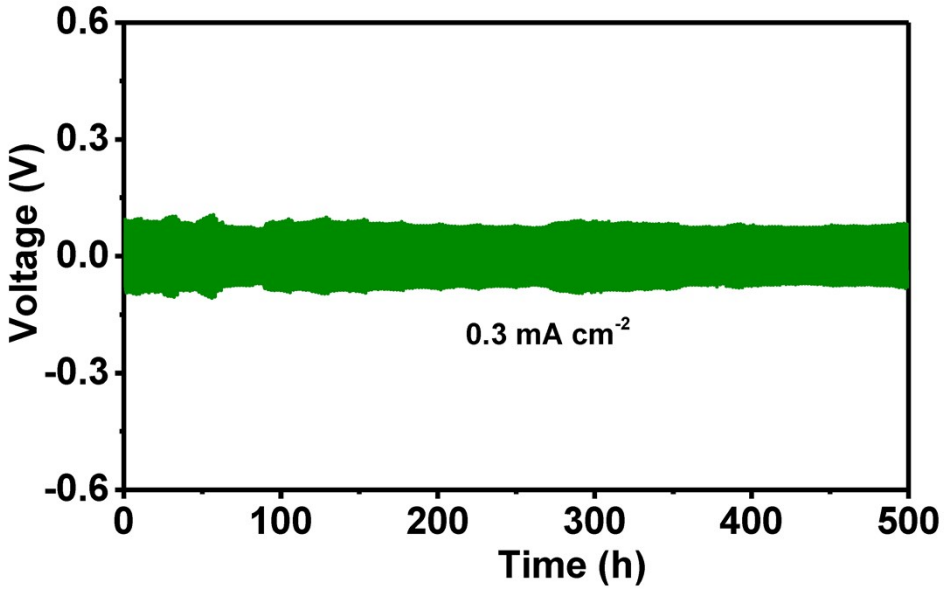

Fig. S11 Galvanostatic cycling data of Li/CPE-10%LLZAO/Li symmetrical cells at a current density of 0.3 mA cm^{-2}.

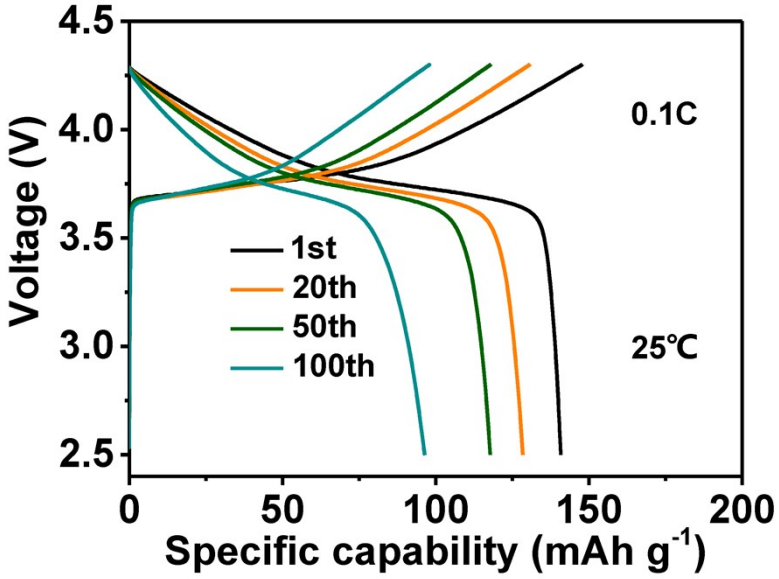

Fig. S12 charge and discharge voltage profiles of SPE-4 based NCM/Li at different cycles with 0.1C.