

Supporting information

Enhanced Lithium-Ion Conductivity and Interfacial Stability of Li-ILs@Fe-BDC Composite Polymer Electrolytes for Solid-State Lithium Metal Batteries

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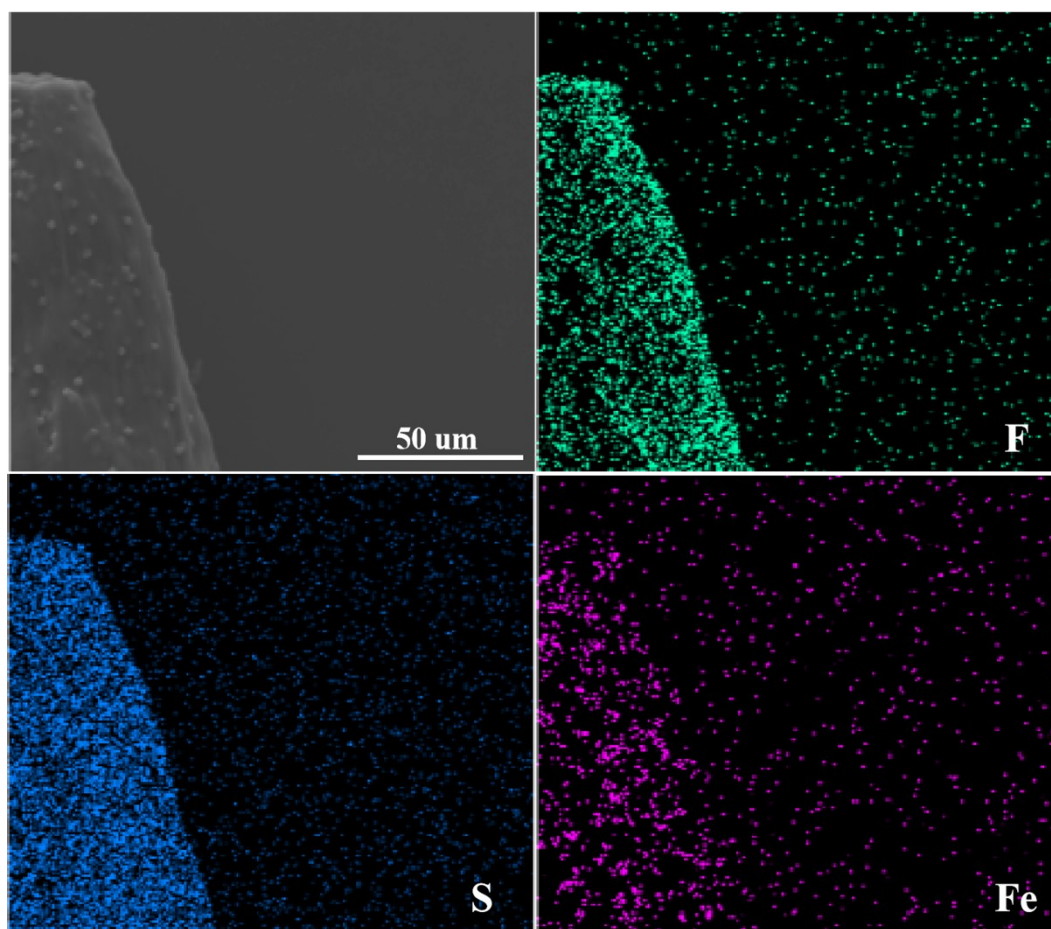


Figure.S 1. FESEM images and EDS mapping of CPE3 from surface.

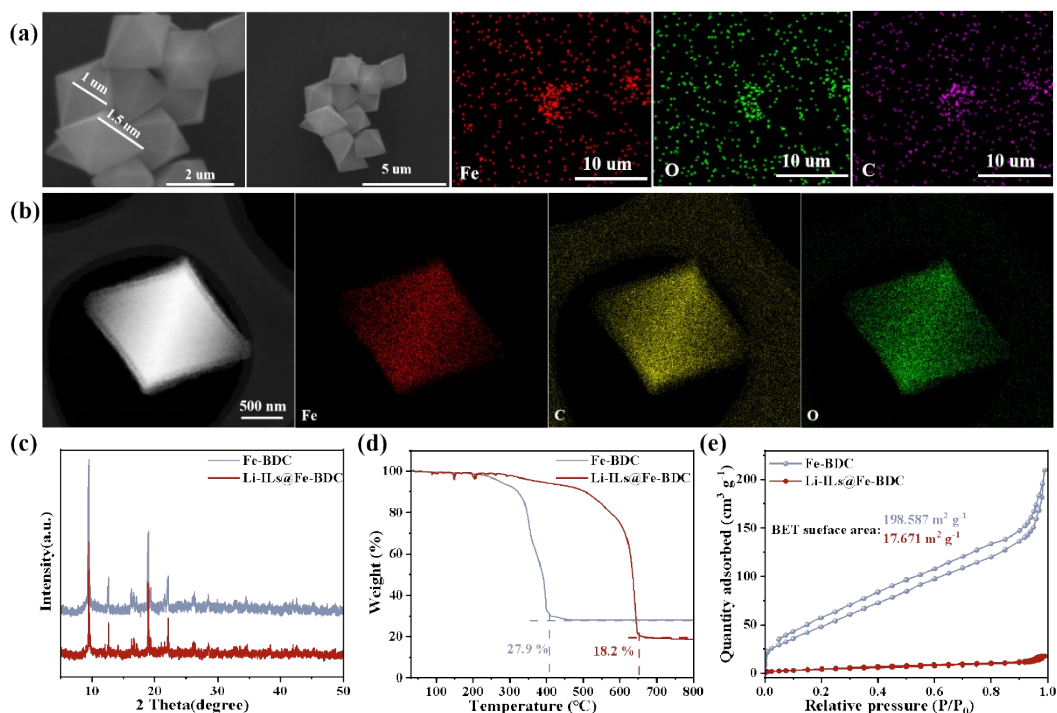


Figure.S 2. (a) FESEM image and EDS mapping of Fe-BDC; (b) TEM image and EDS mapping of Fe-BDC; (c) XRD spectra, (d) TG curves and (e) BET curves of Fe-BDC material and Li-ILs@Fe-BDC composite samples.

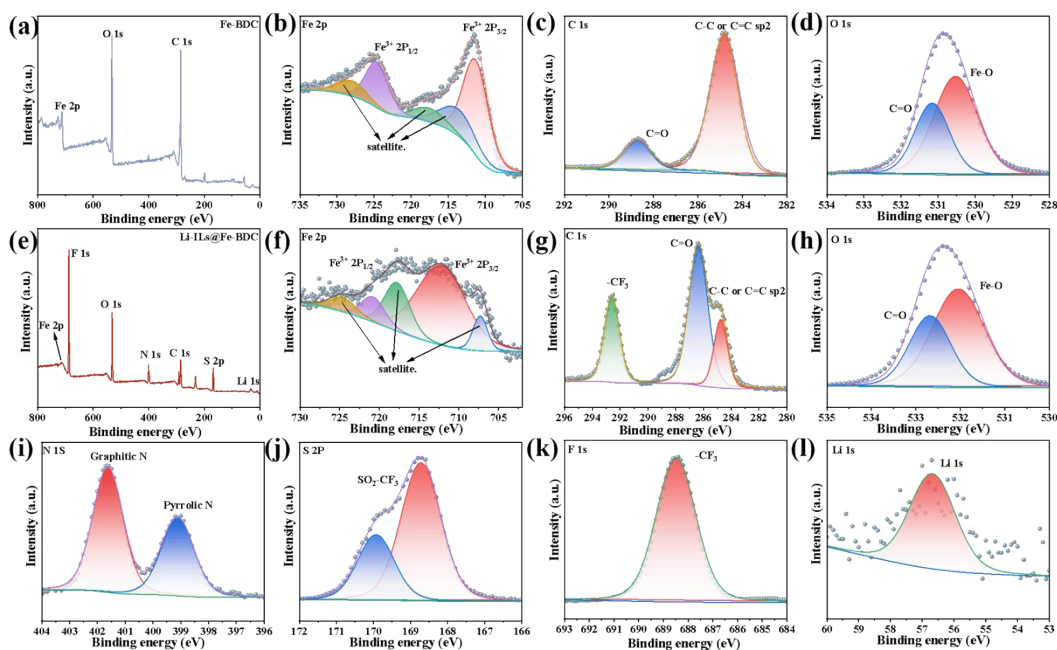


Figure.S 3. XPS spectra survey of (a) Fe-BDC and (e) Li-ILs@ Fe-BDC; (b) Fe 2p, (c) C 1s and (d) O 1s high-resolution spectra of Fe-BDC. (f) Fe 2p, (g) C 1s, (h) O 1s (i) N 1s, (j) S 2p, (k) F 1s and (l) Li 1s high-resolution spectra of Li-ILs@ Fe-BDC.

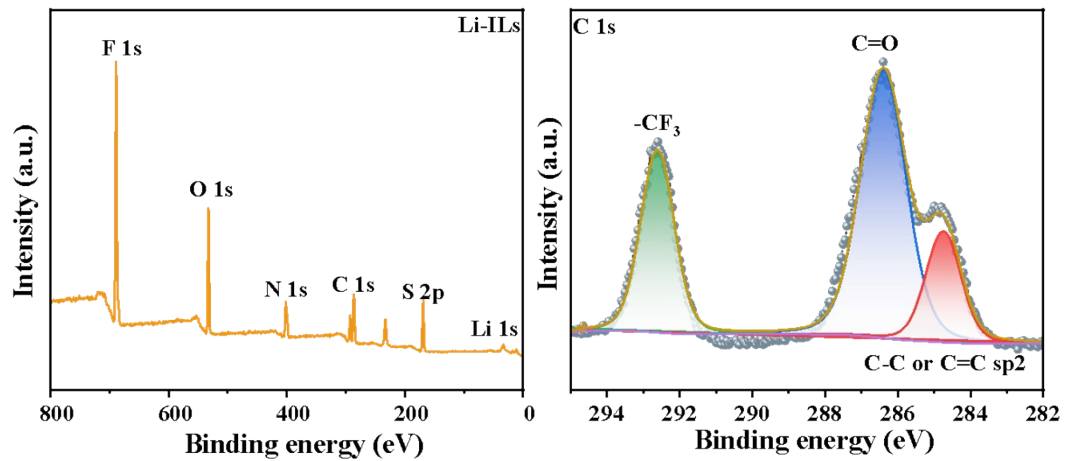


Figure.S 4. XPS spectra survey of Li-ILs and C 1s high-resolution spectra of Li-ILs.

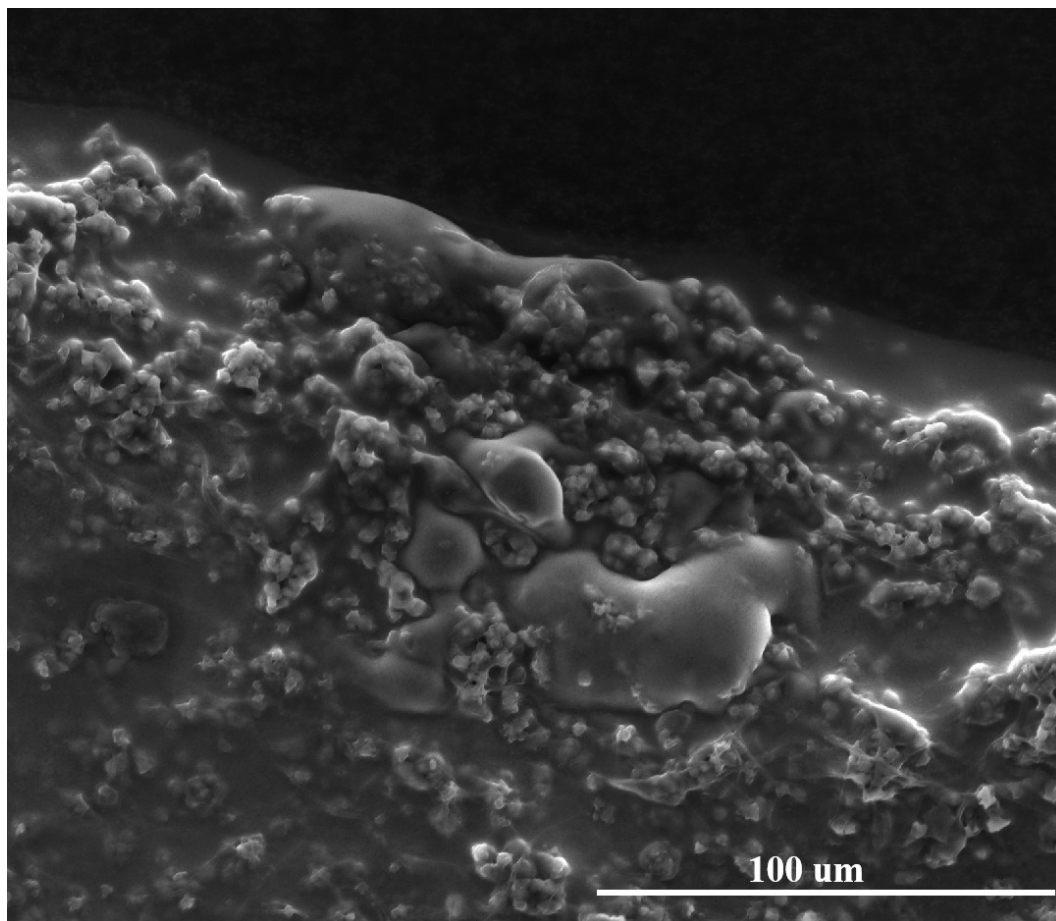


Figure.S 5. FESEM images of CPE4 from surface.

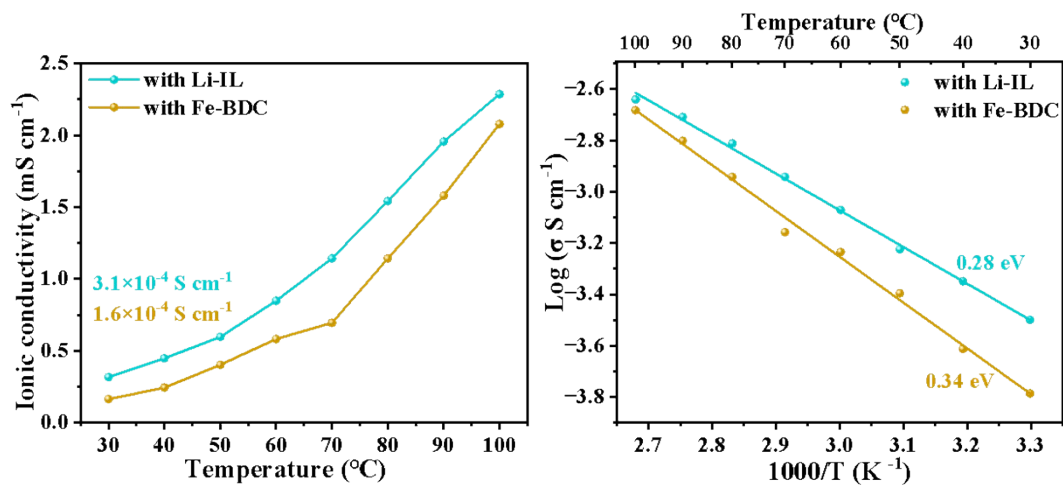


Figure.S 6. (a) Ionic conductivity (δ) of CPEs (with Li-IL and with Fe-BDC) under the different temperatures; (b) Relationship of $\log(\delta)$ vs. Temperatures and ion mobilization activation energies of CPEs.

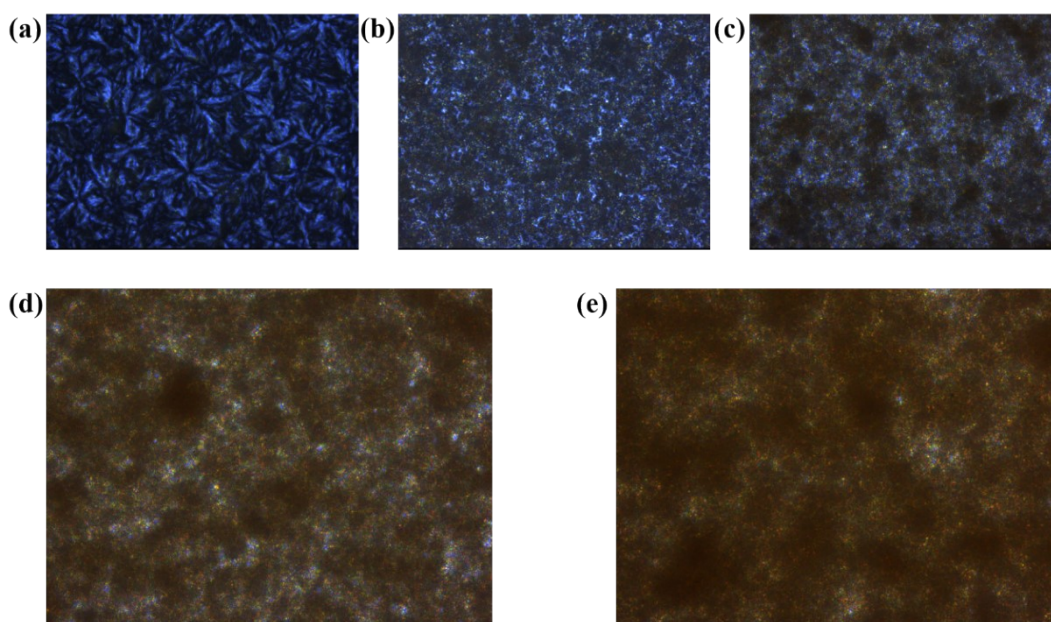


Figure.S 7. POM images of (a) CPE0, (b) CPE1, (c) CPE2, (d) CPE3, (e) CPE4.

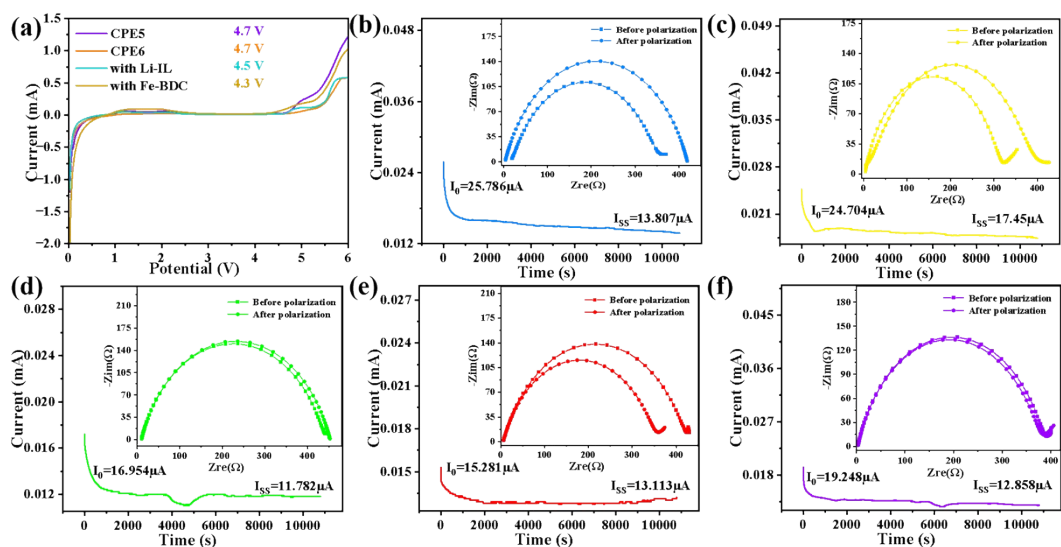


Figure.S 8. (a) Electrochemical stability window of CPE5, CPE6, CPEs with Li-IL and with Fe-BDC; Chronoamperometry profiles and AC impedance spectra before and afterpolarization (inset) for symmetric (b) Li/CPE0/Li cells, (c) Li/CPE1/Li cells, (d) Li/CPE2/Li cells, (e) Li/CPE3/Li cells, (f) Li/CPE4/Li cells.

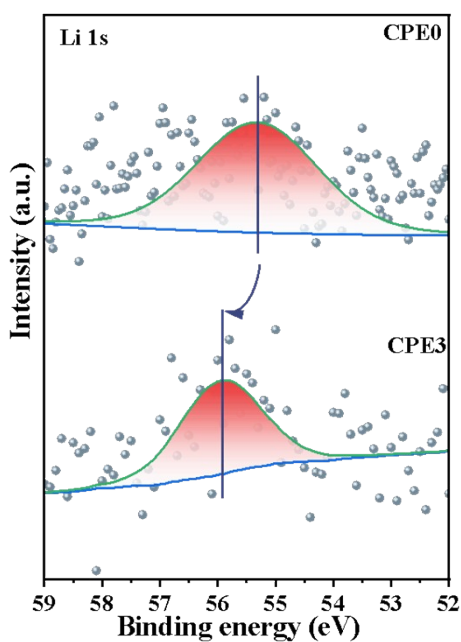


Figure.S 9. Li 1s high-resolution spectra of CPE0 and CPE3.

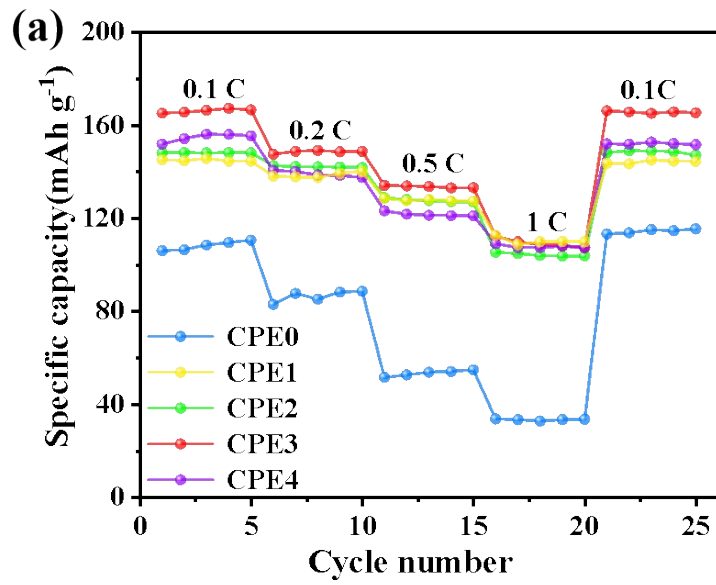


Figure.S 10. Rate performance of LFP/CPEs/Li cells.

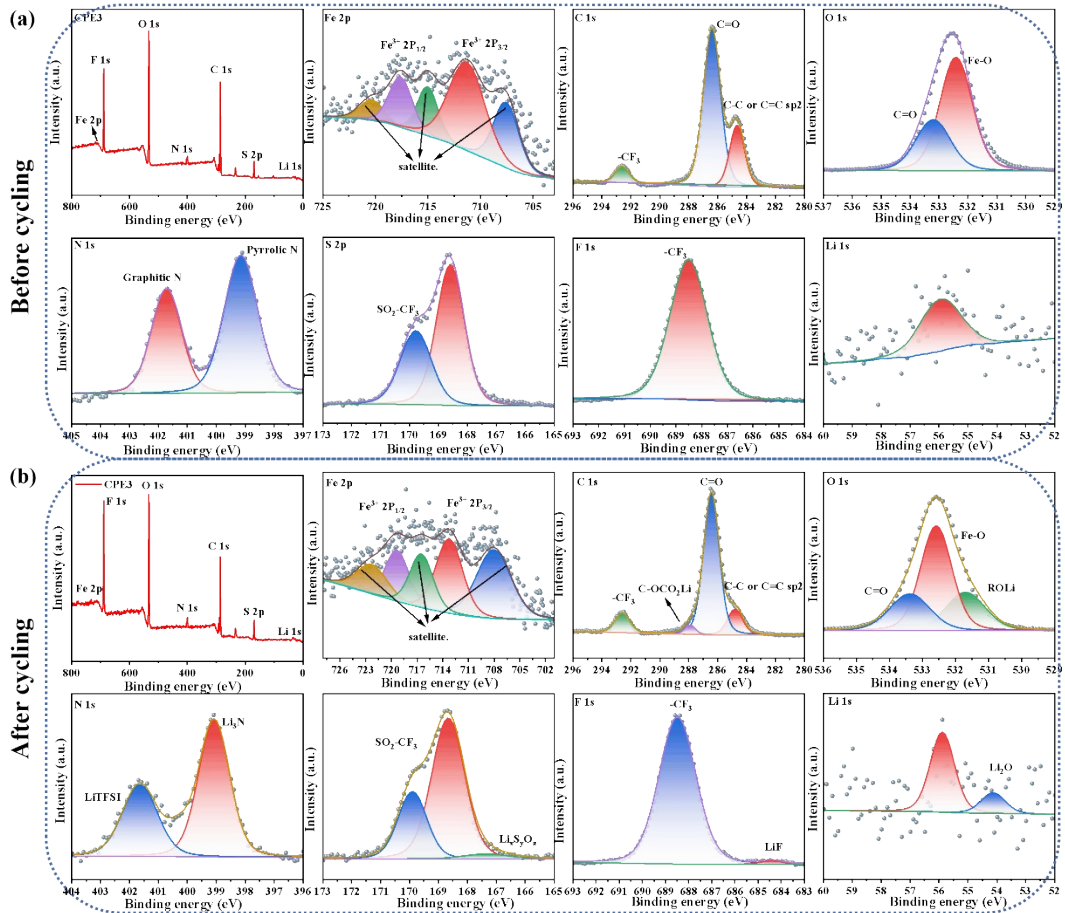


Figure.S 11. XPS spectra survey of CPE3 before and after cycling by LFP/CPE3/Li batteries.

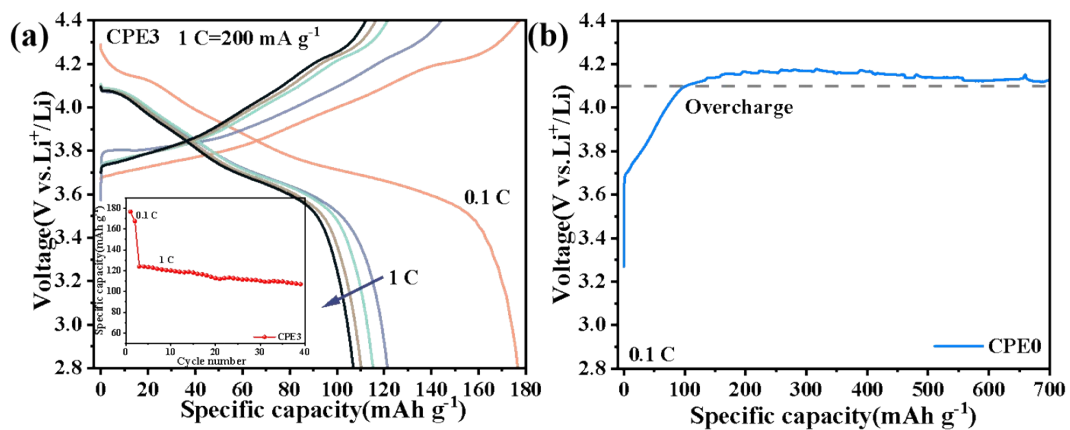


Figure.S 12. Charge and discharge voltage profiles of (a) NCM811/CPE3/Li cells (inset: the cycling performance of NCM811/CPE3/Li cells at 1 C) and (b) NCM811/CPE0/Li cells.