

## Supporting Information

### **Cationic polymer binders inhibit shuttle effects through electrostatic confinement for lithium sulfur batteries**

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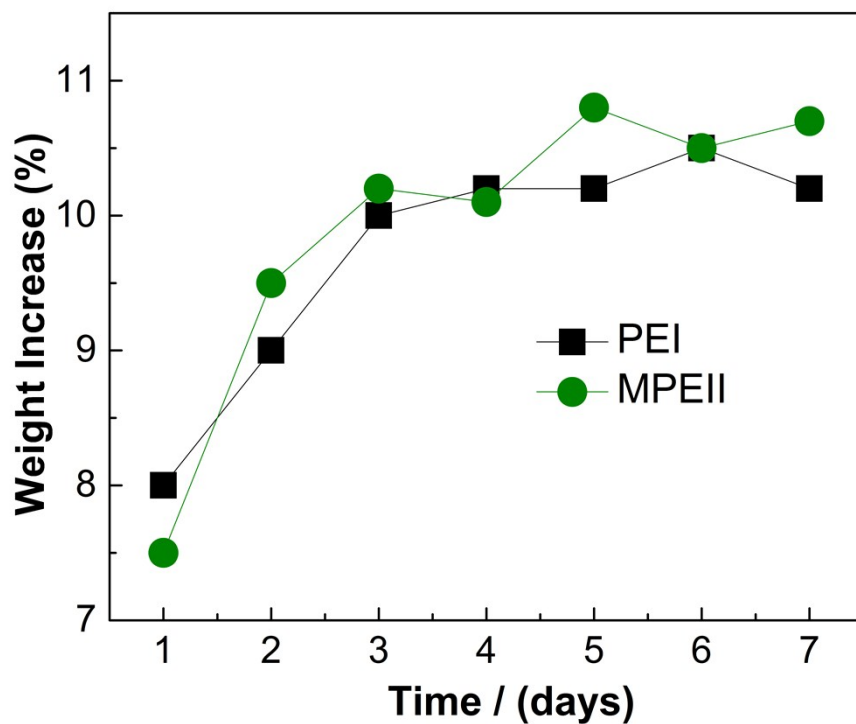


Figure S1 The swelling test of PEI and MPEII polymer in 1M lithium bis(trifluoromethanesulfonyl)imide (LiTFSI) dissolved in a mixture of 1,3-dioxolane and dimethoxyethane(1:1 in volume) with 2% LiNiO<sub>3</sub> added as an additive

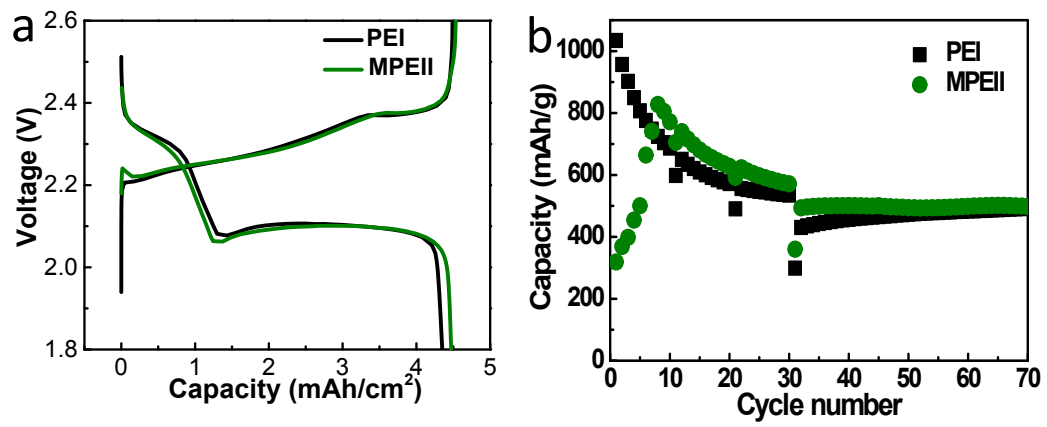


Figure S2 (a) Capacity voltage profiles and (b) Cycling performance of PEI and MPEII based sulfur electrodes at 0.05C.

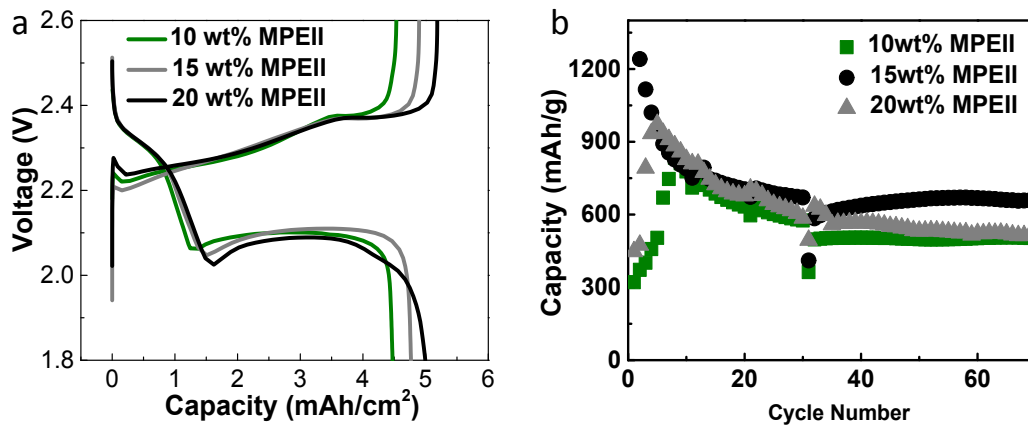


Figure S3 (a) Capacity voltage profiles and (b) Cycling performance of MPEII based sulfur electrodes at 0.05C.

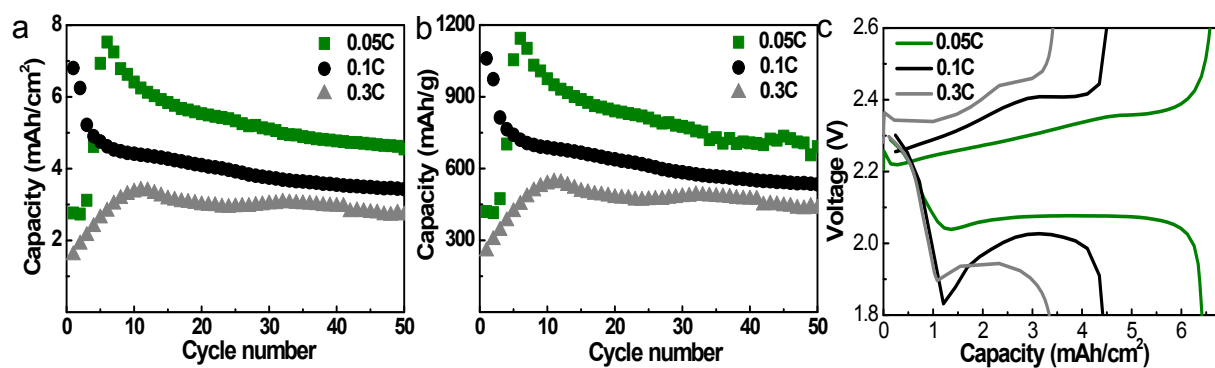


Figure S4 (a,b) Rate performance and (c) Charge/discharge profiles at the 10th cycle of S cathode using MPEII binder.

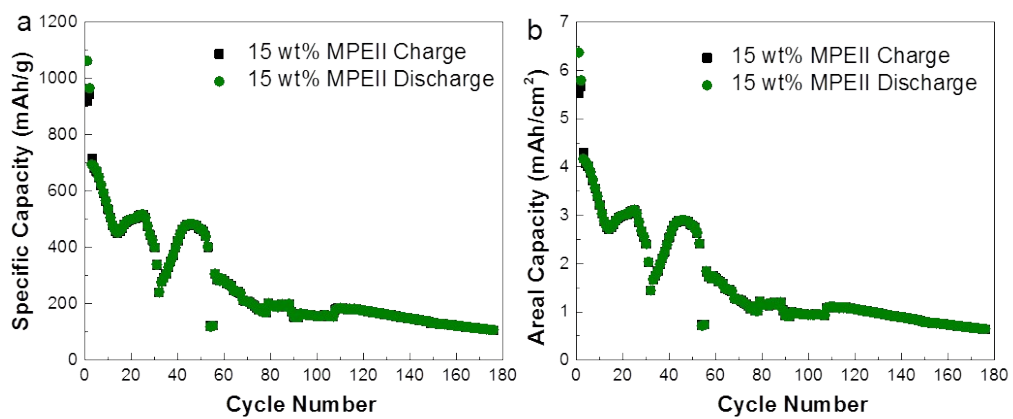


Figure S5 Cycling performance of cathodes with 15 wt% MPEII binder at 1C rate.

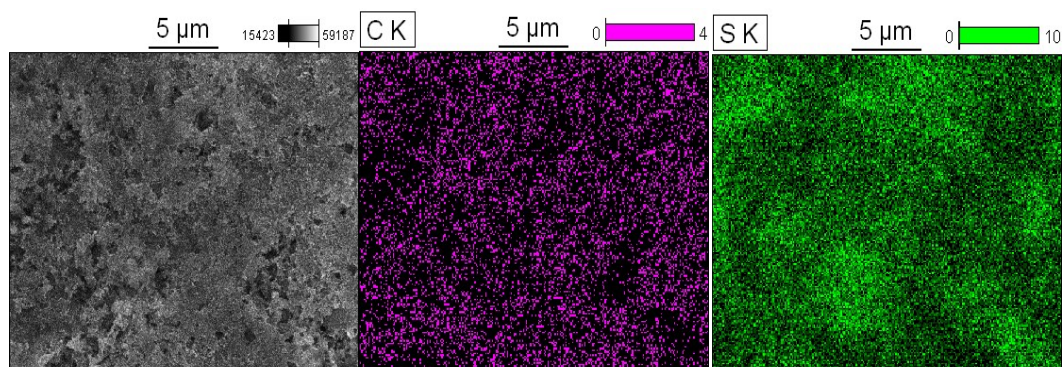


Figure S6 Energy dispersive Spectra (EDS) mapping of PEI based sulfur electrode.

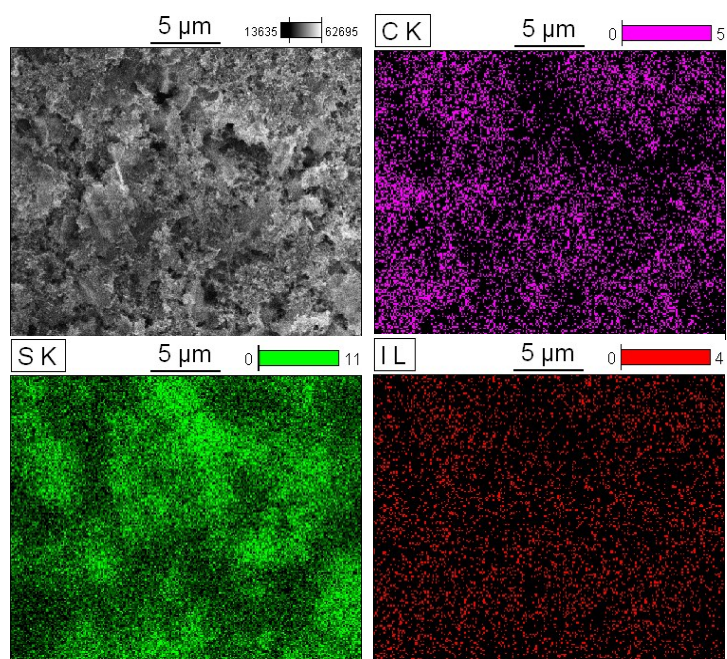


Figure S7 Energy dispersive Spectra (EDS) mapping of MPEII based sulfur electrode.