

Supporting information

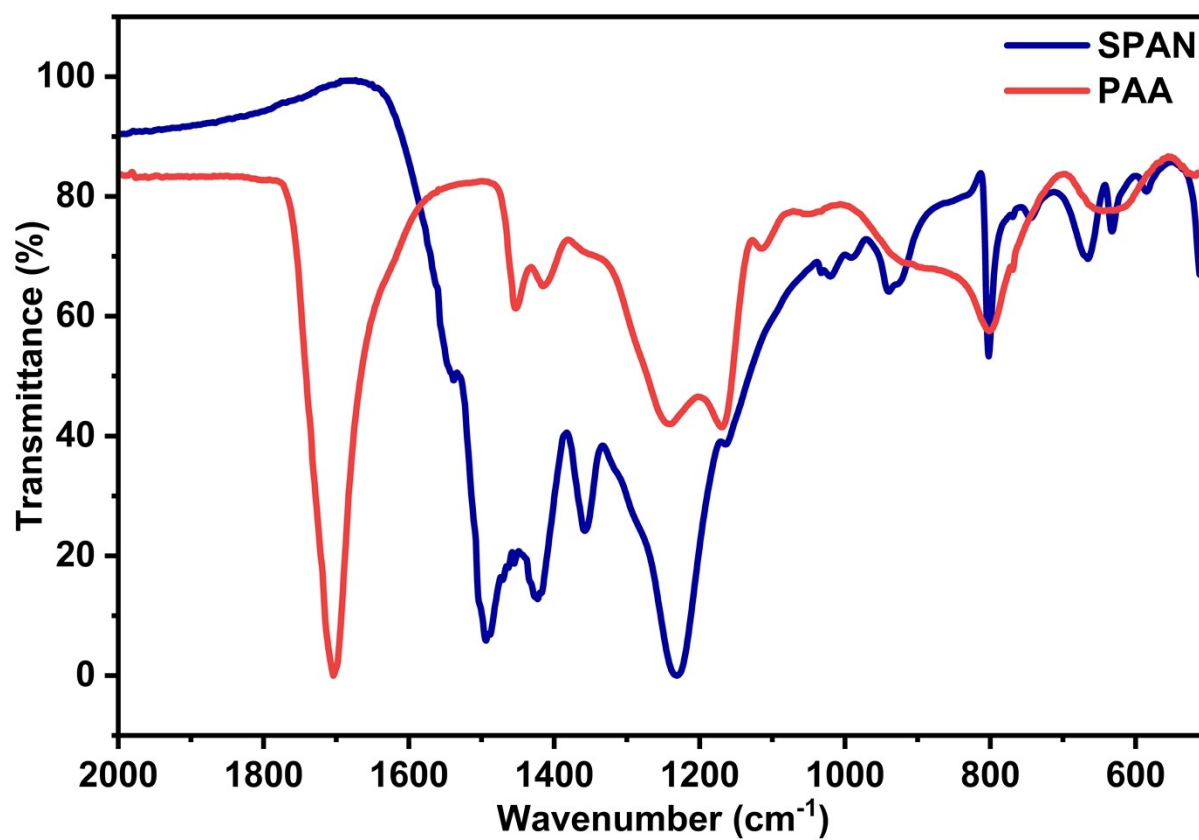


Figure S1 FT-IR spectra of the synthesized SPAN, and PAA

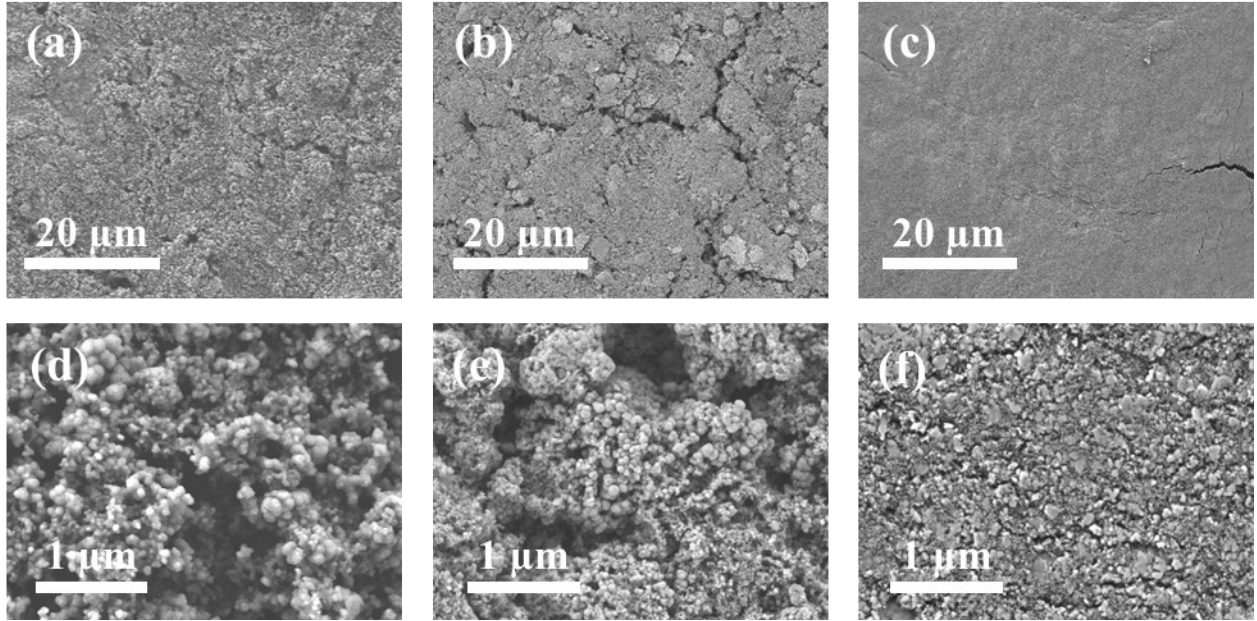


Figure S2 The SEM images of surface of SPAN electrode before cycling, with the binder PAA (a and d), PVDF (b and e) and TAB 2 (c and f)

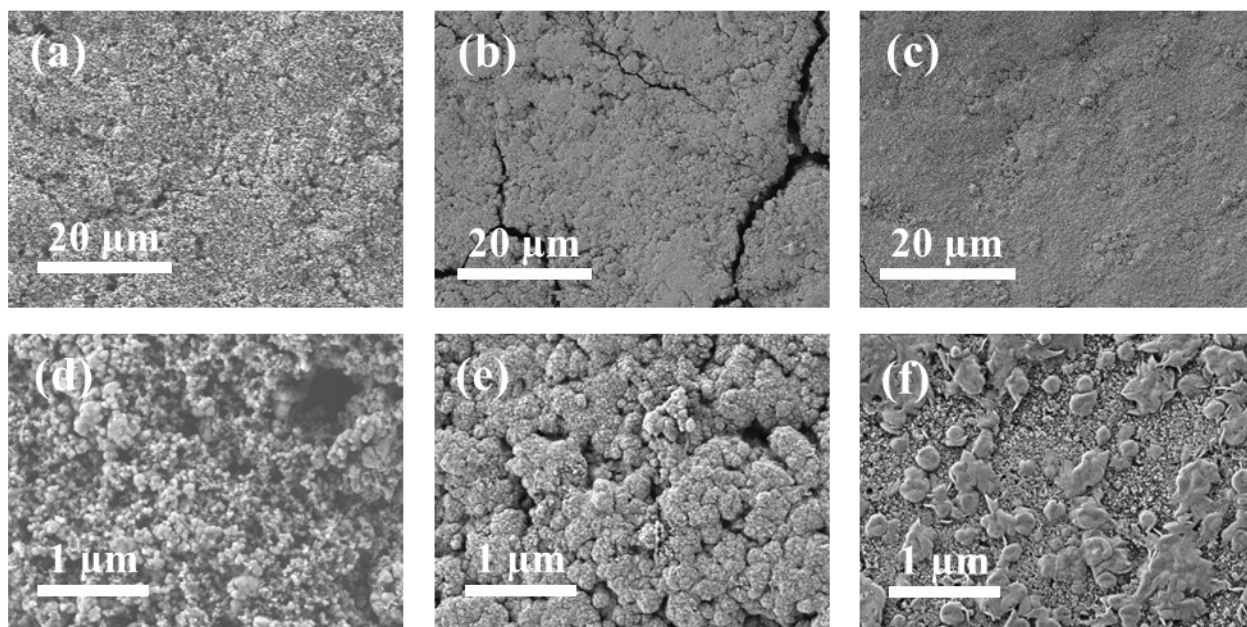


Figure S3 The SEM images of surface of SPAN electrode after cycling, with the binder PAA (a and d), PVdF (b and e), and TAB 2 (c and f)

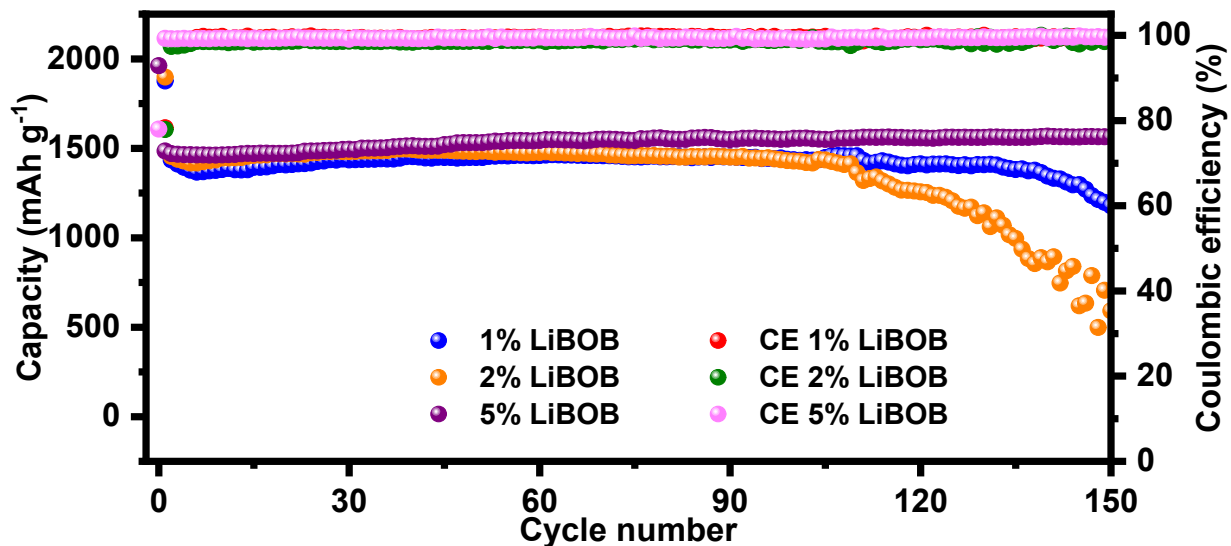


Figure S4 Comparison of electrochemical performance of Li|SPAN half-cell with electrolyte of 1M LiPF₆ in EC-DEC containing different concentrations of LiBOB additive (wt/v %)

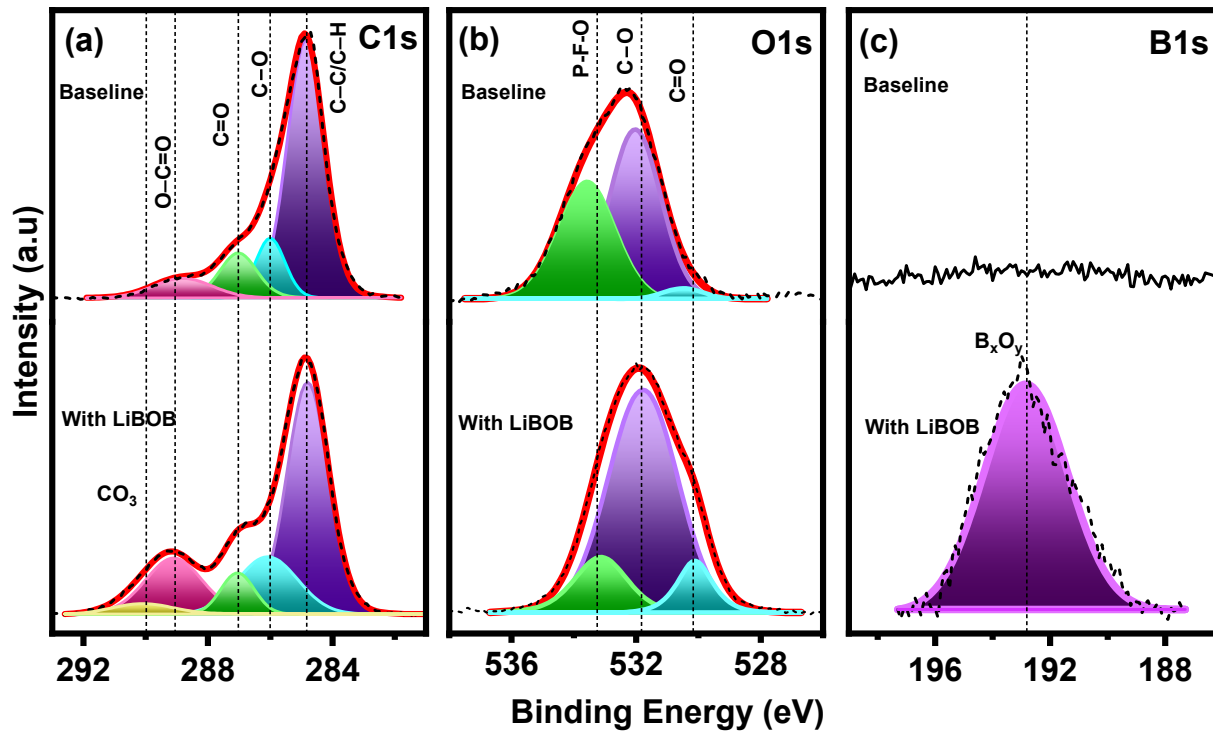


Figure S5 The C, O and B XPS spectra of SPAN electrodes after three cycles in electrolyte without (baseline) and with 5% LiBOB.

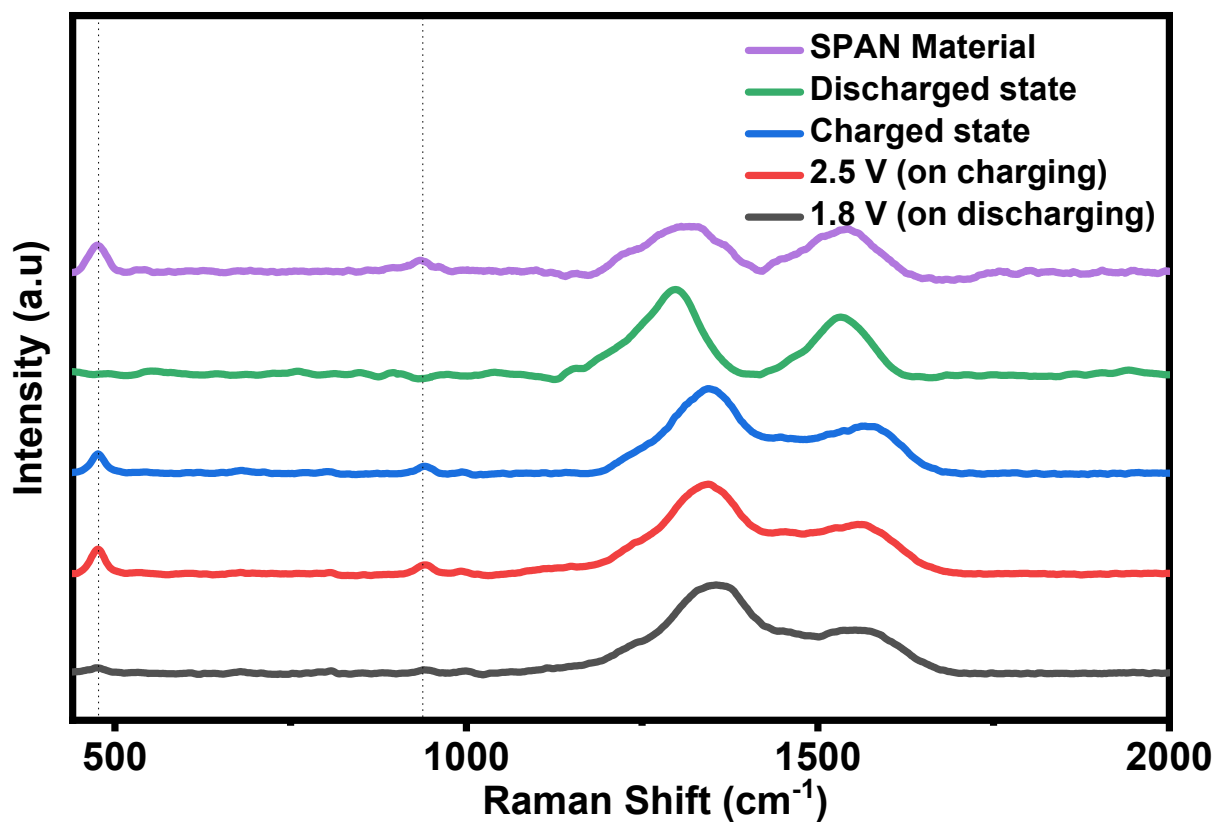


Figure S6 Raman spectra in the range of 440-2000 cm^{-1} of SPAN electrode at pristine and various states of discharge–charge.

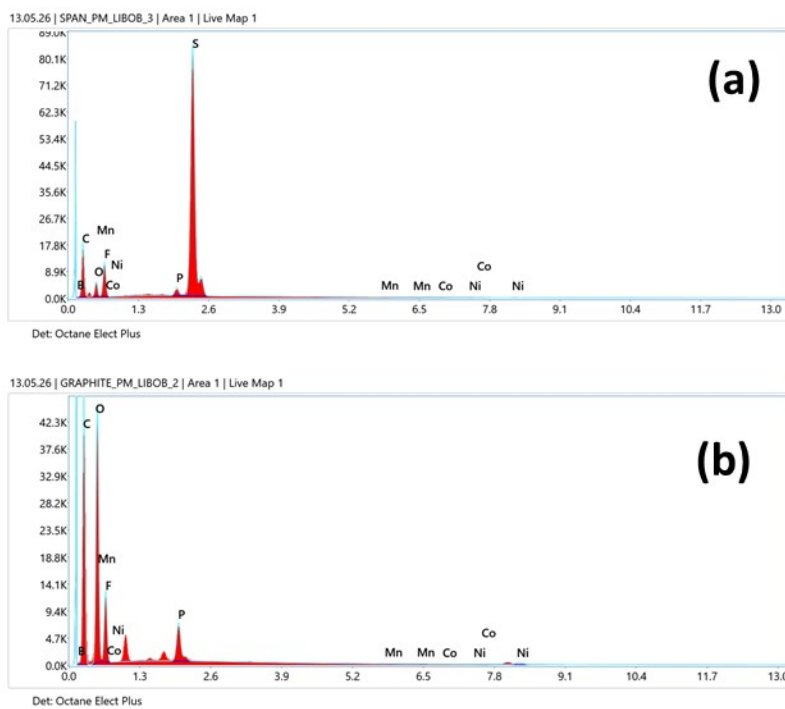


Figure S7 EDAX spectrum of (a) SPAN electrode, and (b) Graphite electrode

Table S1 Quantitative result of EDAX analysis of SPAN electrode from SPAN-PAA||NMC111 cell

Element	Weight %	MDL	Atomic %	Net Int.
B K	5.5	1.87	7.0	2.6
C K	66.1	0.23	76.0	312.0
O K	6.4	0.11	5.5	93.0
F K	6.6	0.04	4.8	229.7
P K	0.4	0.01	0.2	73.5
S K	14.9	0.01	6.4	2428.7
Mn K	0.0	0.04	0.0	2.0
Co K	0.0	0.04	0.0	1.8
Ni K	0.0	0.05	0.0	1.3

Table S2 Quantitive result of EDAX analysis of Graphite electrode from Graphite||NMC111 cell

Element	Weight %	MDL	Atomic %	Net Int.
B K	5.6	0.34	6.9	7.0
C K	57.2	0.04	63.4	813.2
O K	30.1	0.04	25.0	863.3
F K	6.3	0.03	4.4	247.6
P K	0.8	0.01	0.3	183.8
Mn K	0.0	0.02	0.0	1.0
Co K	0.0	0.00	0.0	0.6
Ni K	0.0	0.03	0.0	0.8