

## Supporting Information

# Bifunctional Surface Modification Coupled with Oxygen Defect Engineering Enables High Performance Li-rich Cathode

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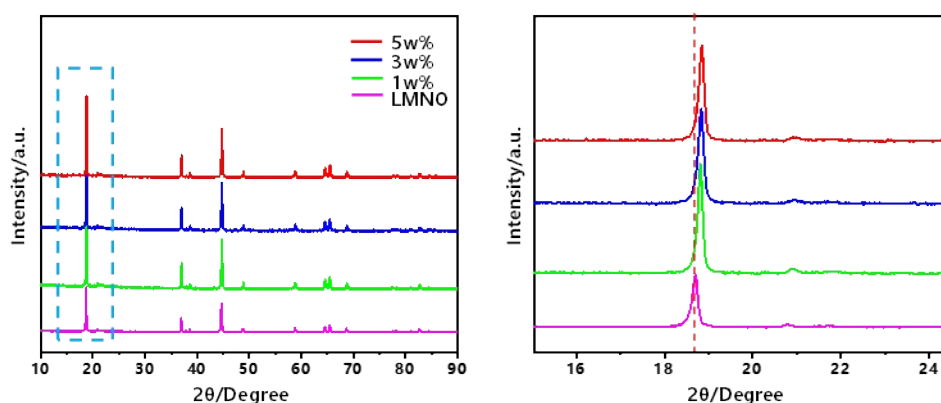


Fig. S1 XRD results of 1w%, 3w%, 5w% and LNCM samples

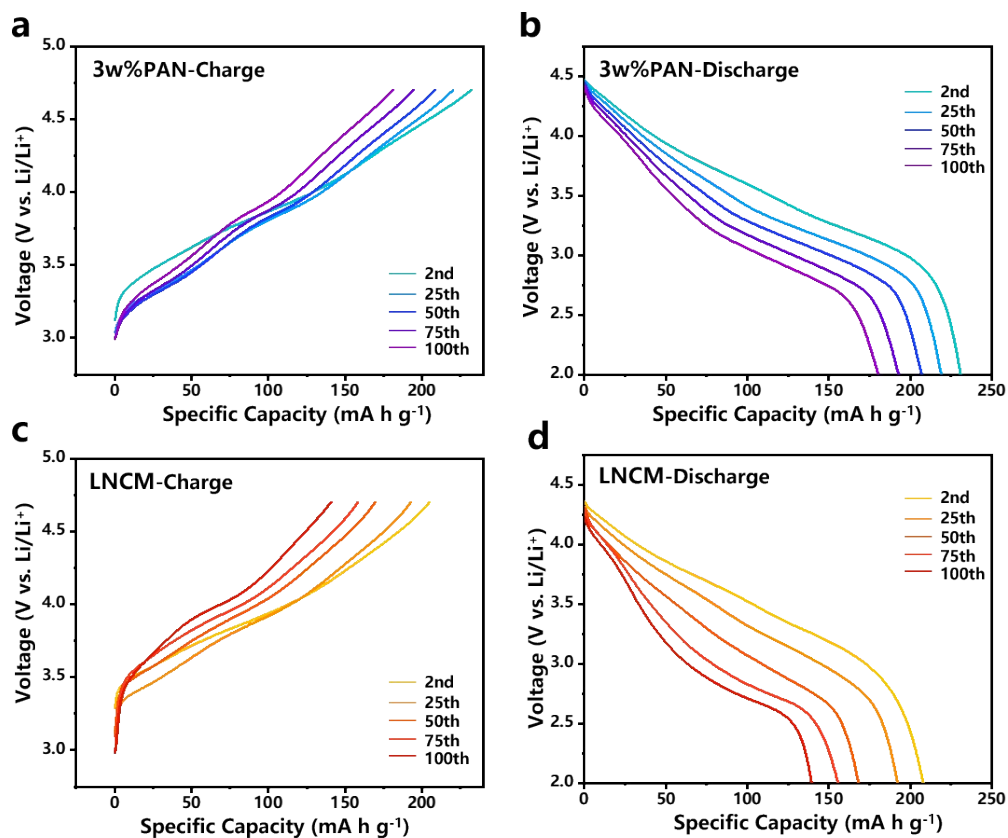


Fig. S2 Comparison of charge/discharge curves at 0.5C with different number of turns (a,b) 3w% PAN; (c-d) LNCM

Table S1 1w%, 3w%, 5w% and LNCM first cycle Coulomb efficiency

samples	1w%PAN	3w%PAN	5w%PAN	LNCM
first cycle efficiency	82.4%	83.1%	81.6%	80.9%

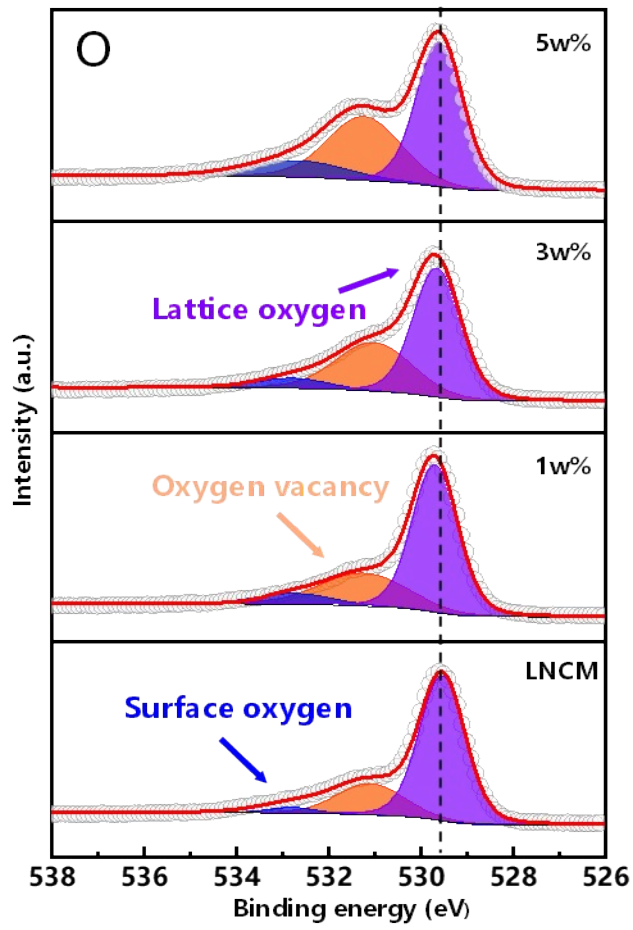
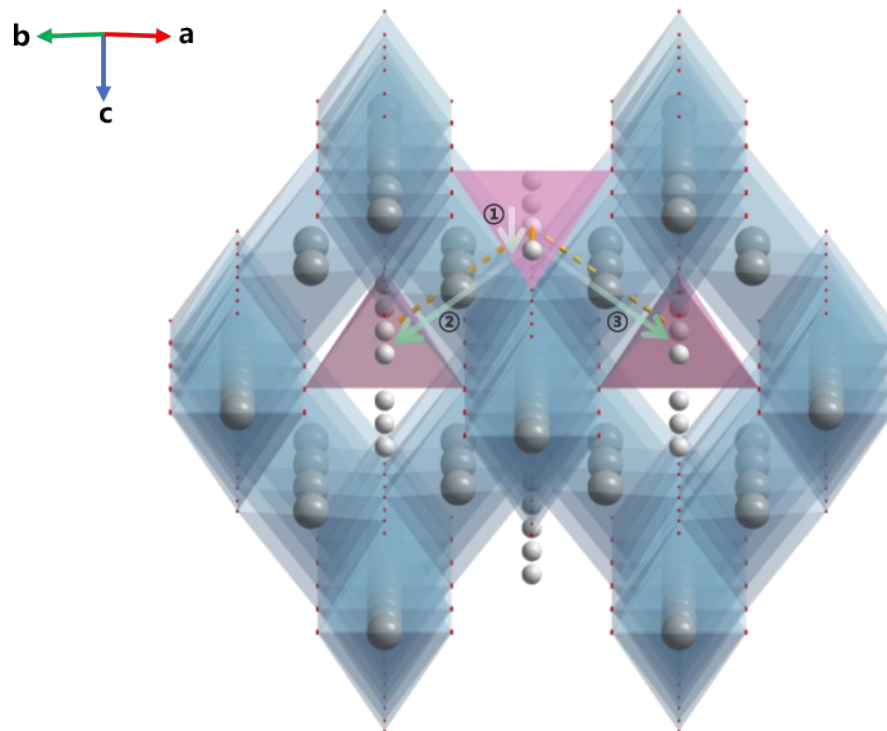
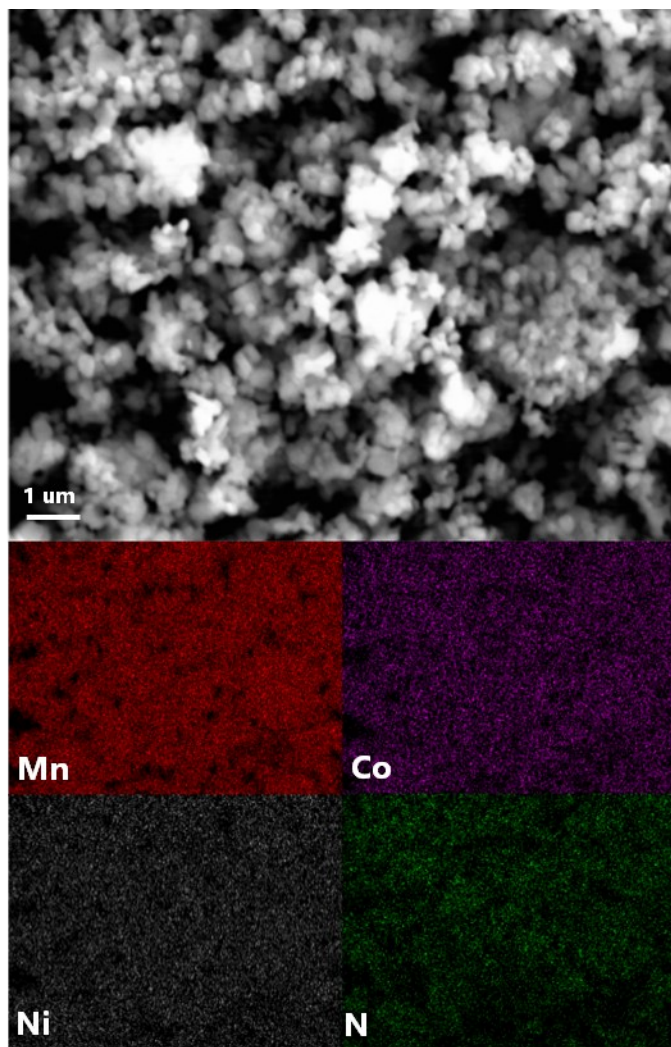


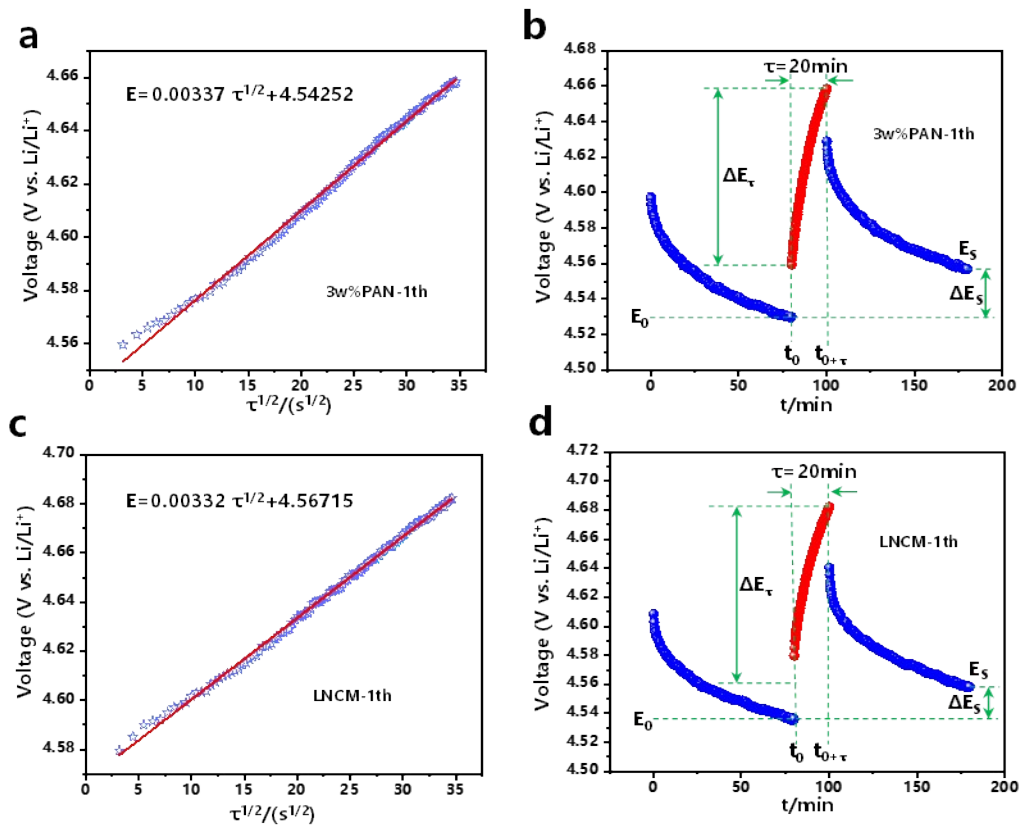
Fig. S3 XPS analysis results of oxygen element in 1w%, 3w%, 5w% and LNCM



**Fig. S4 3w%-PAN sample face sweep test results**



**Fig. S5 3w%-PAN sample face sweep test results**



**Fig. S6 (a,c) Linear relationship between E and  $t^{1/2}$  of 3w% PAN and LNCM; (b,d) Single GITT titration curves of 3w% PAN and LNCM**

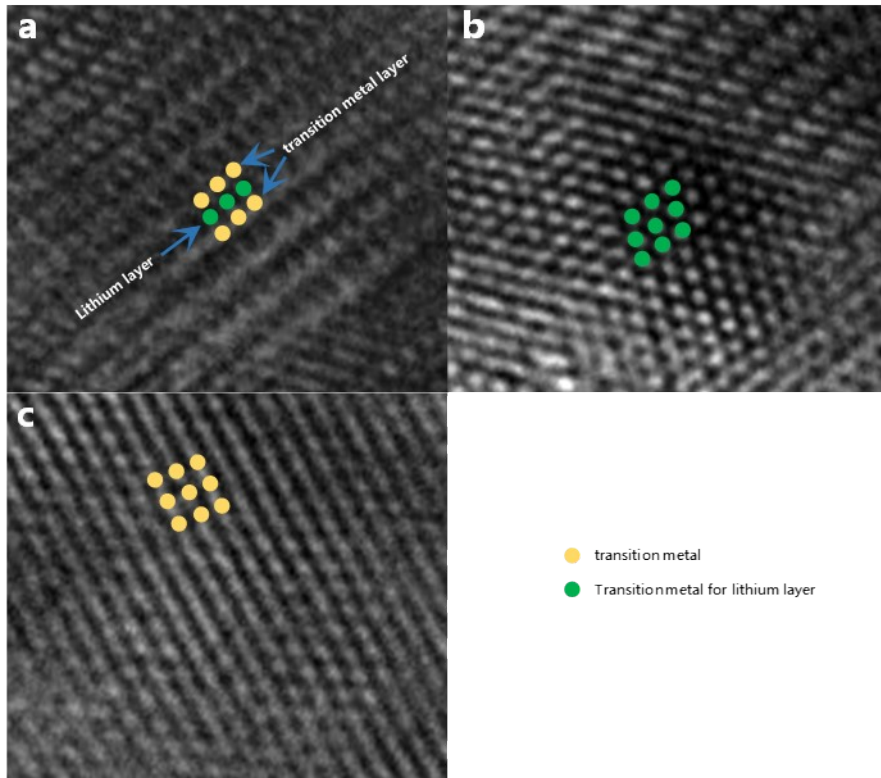


Fig. S7 Atomic arrangement (a) spinel phase; (b) salt rock phase; (c) layered structure

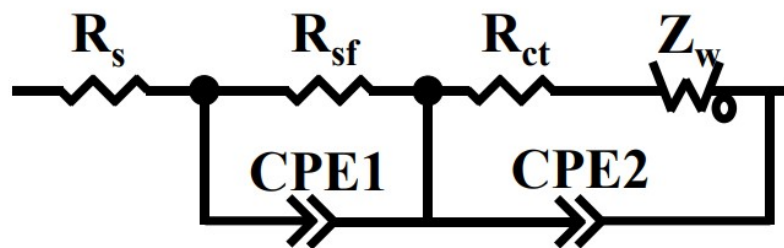


Fig. S8 AC Impedance Equivalent Circuit