

Supporting Information

Enabling Stable and High-Rate Cycling of Ni-Rich Layered Oxide Cathode for Lithium-Ion Batteries by Modification with an Artificial Li⁺-Conducting Cathode-Electrolyte Interphase

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Table S1. The vibration modes and assignment of the FT-IR absorption bands.

Wave number (cm ⁻¹)	Mode of vibration	Assignment
1805	$\nu_{C=O}$	polycarbonate
1605	$\nu_{C=O}$	ROCOOLi
1431	ν_{C-O}	ROCOOLi
1384	β_{C-H}	-CH ₃
1261	ν_{C-O}	polycarbonate
1169	$\nu_{s. C-O-C}$	polycarbonate
1135	ν_{C-C}	C-C
1075	$\nu_{as. C-O-C}$	polycarbonate
986	β_{C-H}	C-H
866	δ_{Li-O}	ROLi/Li ₂ CO ₃
767	γ_{C-H}	{CH ₂ } _n
724	γ_{C-H}	{CH ₂ } _n

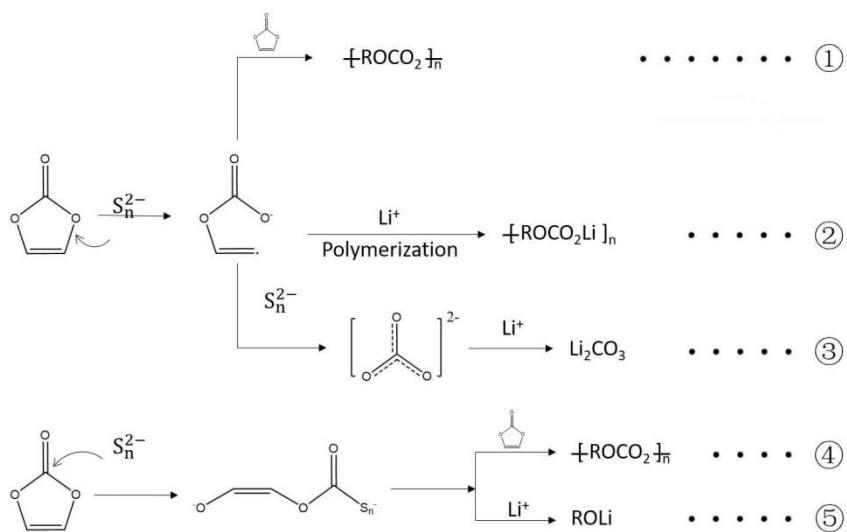


Fig. S1. Possible reaction routes of polysulfides with VC molecules.

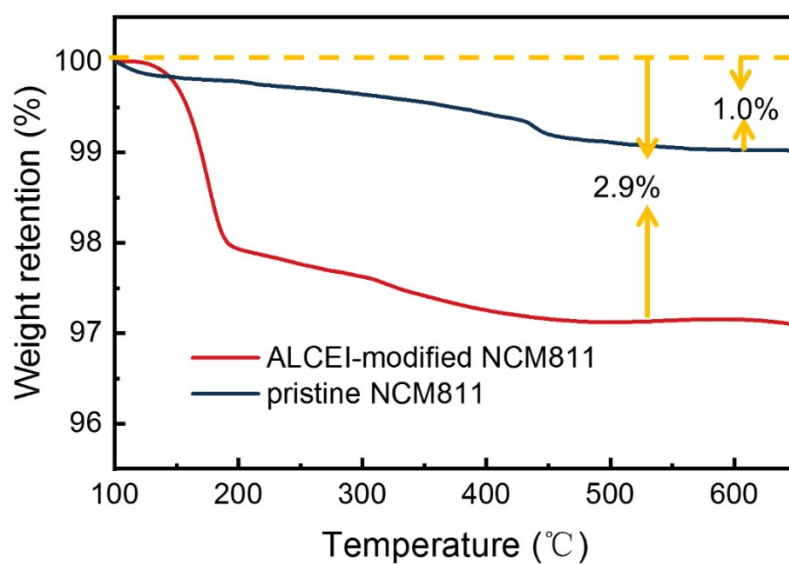


Fig. S2. TG curves of pristine and ALCEI-modified NCM811 in air.

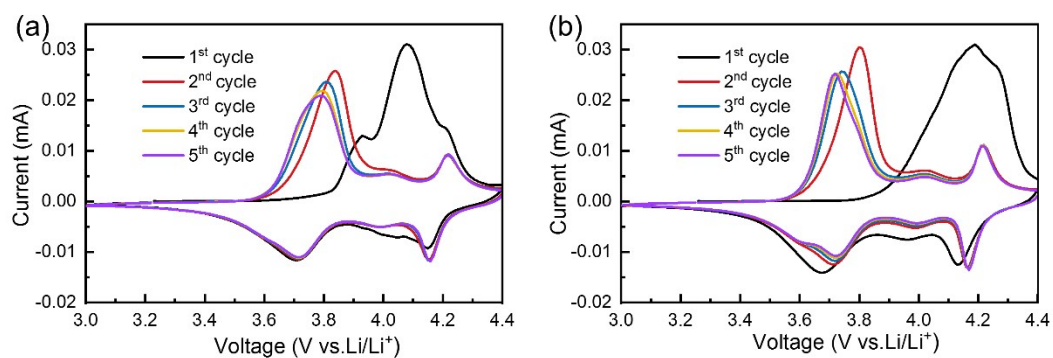


Fig. S3. CV curves of (a) pristine and (b) ALCEI-modified NCM811 cathodes with a scan rate of 0.2 mV s^{-1} in a potential interval of 3.0-4.4 V (vs Li/Li^+).

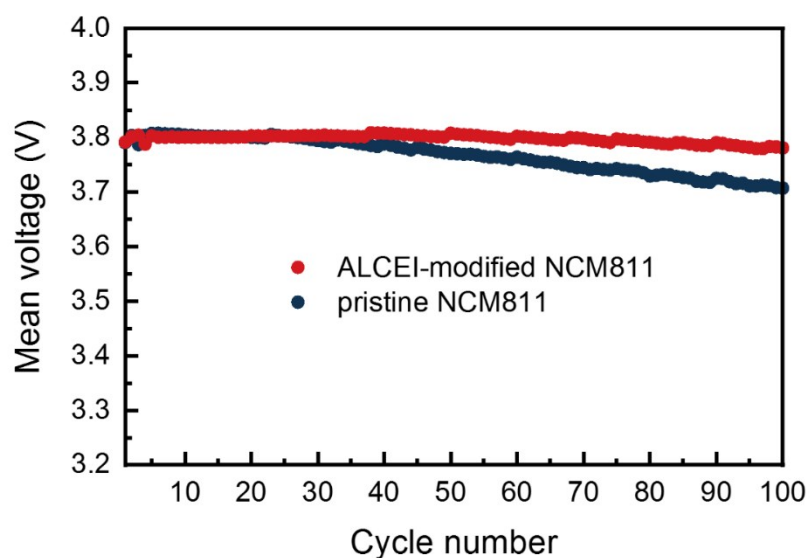


Fig. S4. Variations of mean discharge voltage for both the pristine and ALCEI-modified NCM811 cathodes with cycling numbers.

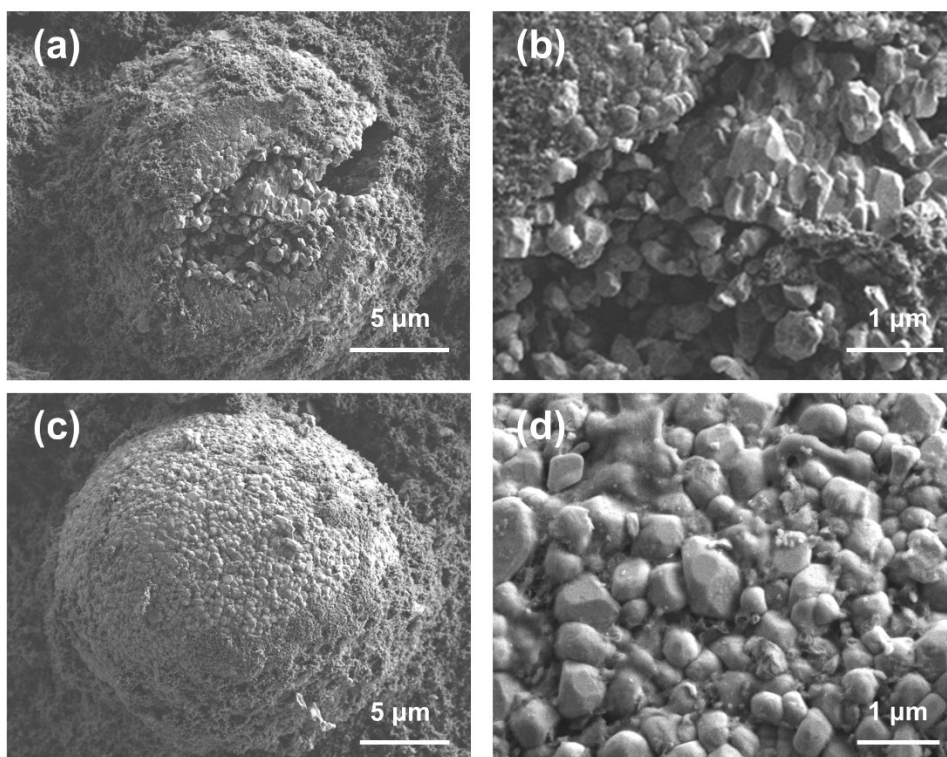


Fig. S5. SEM images of the cathodes after 40 cycles: (a, b) pristine and (c, d) ALCEI-modified NCM811.

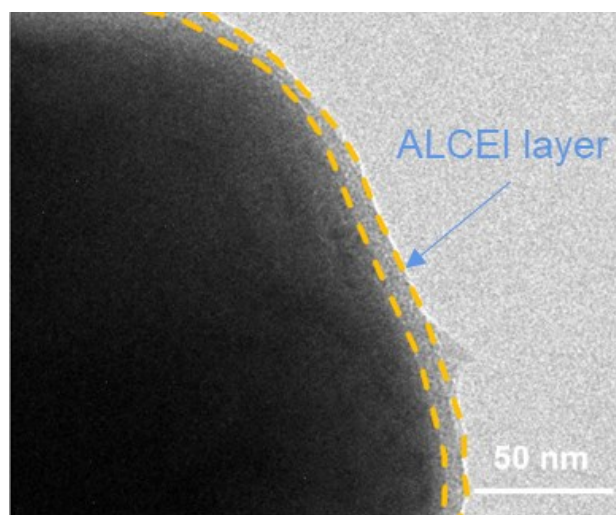


Fig. S6. TEM image of the ALCEI-modified cathode after 40 cycles