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A self-cooling and retardant electrolyte for safer lithium ion battery

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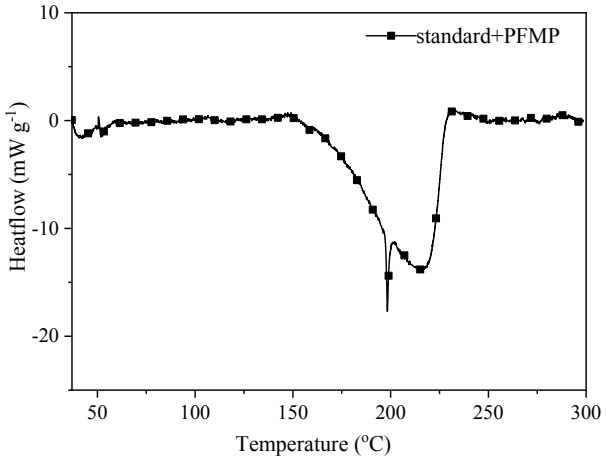

Fig. S1. Thermal stability of the mixture of standard electrolyte and PFMP.

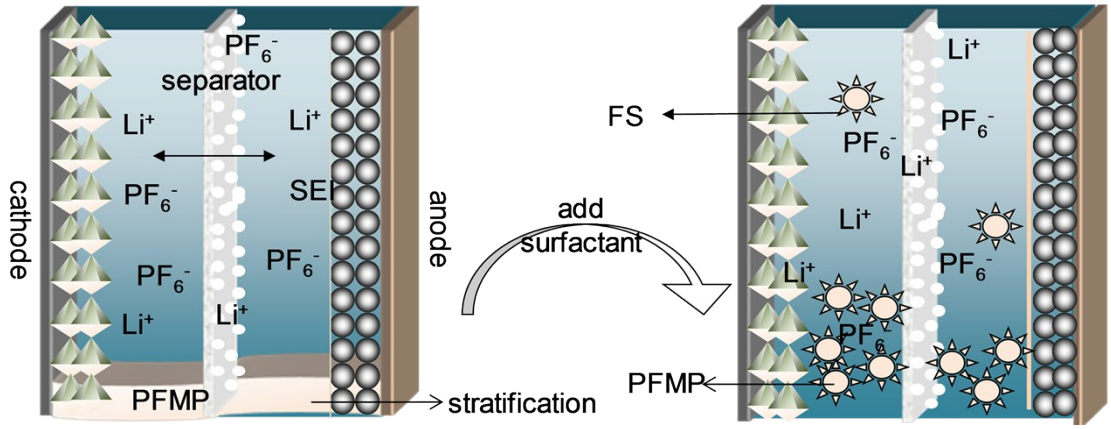

Fig. S2. Illustration of the electrolyte system with and without FS.

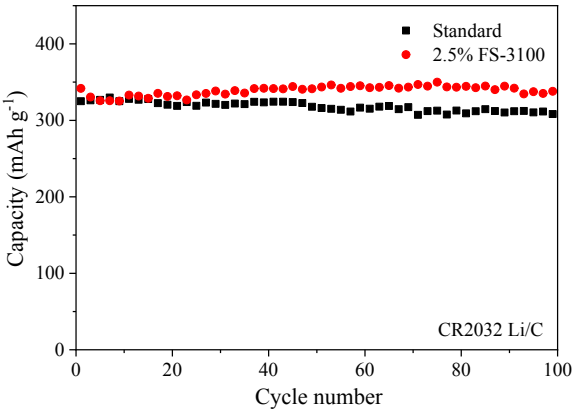

Fig. S3. Cycle performances of Li/C cells with and without FS in standard electrolyte.

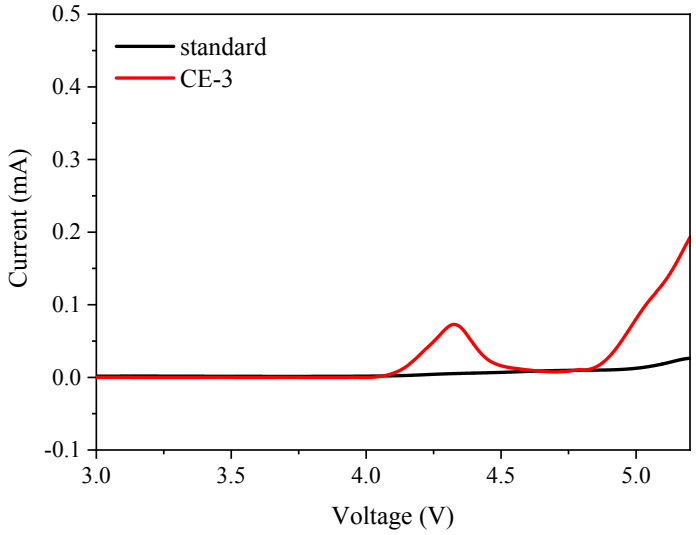

Fig. S4. LSV curves of standard and composite electrolyte (CE-3). The potential is scanned at a 1 mV s^{-1} rate.

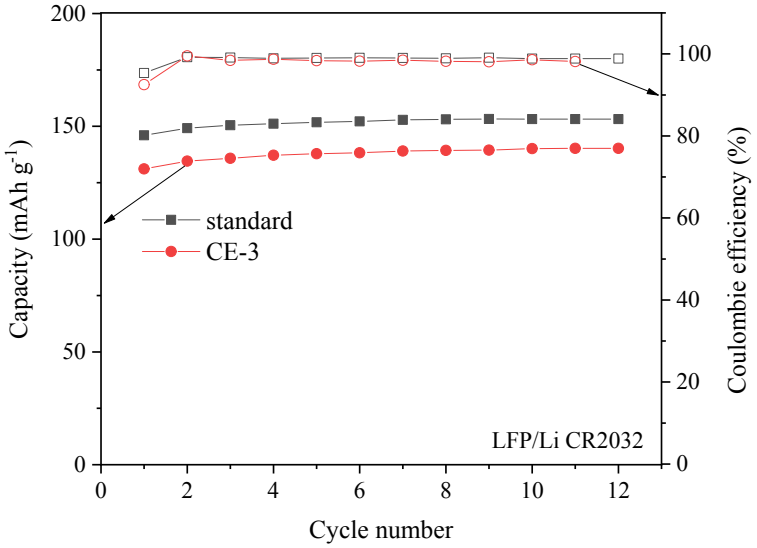

Fig. S5. Cycle test of LFP/Li cells with standard electrolyte and CE-3 composite electrolyte.

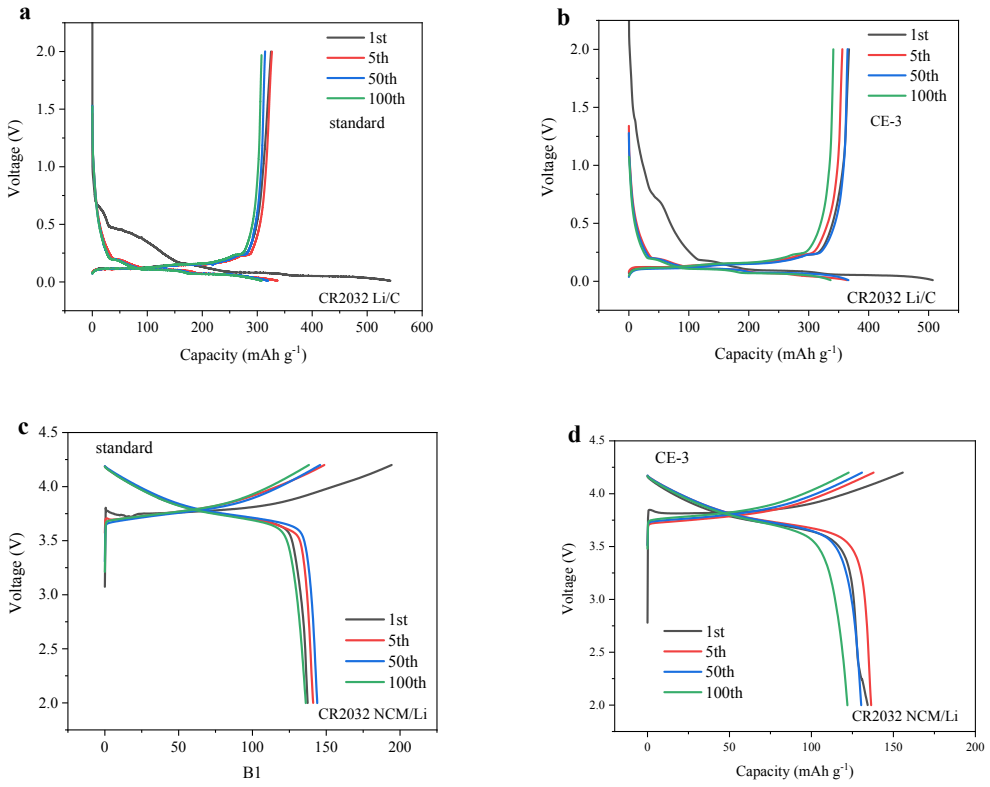

Fig. S6. Charge and discharge curves of (a, b) Li/C and (c, d) NCM/Li cells with standard electrolyte and CE-3 composite electrolyte.

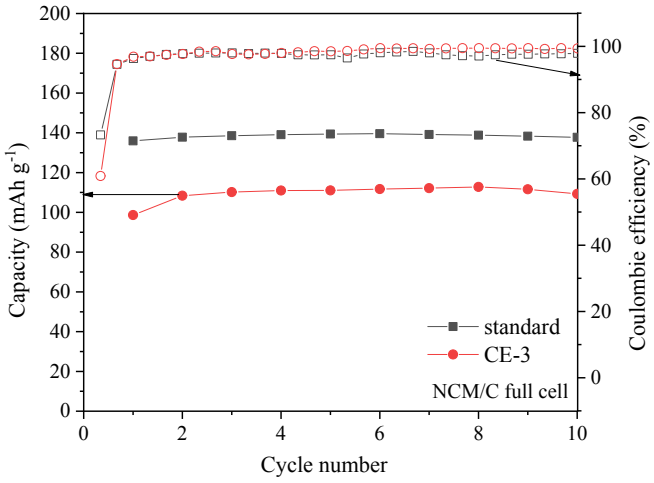

Fig. S7. Cycle performance of full cell (NCM/C) with standard and composite electrolyte (CE-3).

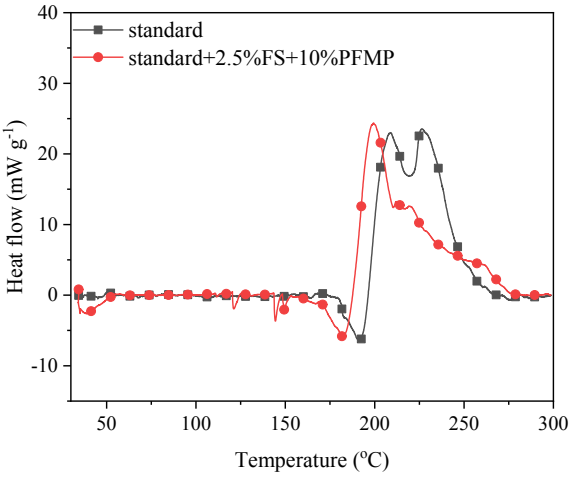

Fig. S8. Thermal stability of standard electrolyte with 2.5% FS and 10% PFMP.

Table S1 The relative atomic percentages of C1s, Li1s, P2p, N1s, F1s and O1s of the graphite anode surface cycled in standard and composite electrolyte (CE-3).

Atom (%)	C1s	Li1s	P2p	N1s	F1s	O1s
standard	25.97	26.22	0.6	0.21	21.23	25.77
CE-3	26.34	25.6	0.75	0.27	27.13	19.91

Table S2. Thermodynamics of standard electrolyte and composite electrolyte by C80 test.

Electrolyte	Exothermic Peak (°C)	Heat Absorption (J g^{-1})	Total Heat Generation (J g^{-1})
standard	208.99	20.55	-251.70
CE-2	242.32	55.79	-160.90
CE-3	243.88	72.90	-29.57