

**Tris(2,2,2-trifluoroethyl) phosphite (TTFP) as a flame retardant
co-solvent to improve safety and electrochemical performances
of lithium-ion batteries**

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Table S1 The data of initial charging/discharging capacity and Coulombic efficiency for batteries containing different percentages of TTFP at 4.2 V

Samples	The initial charging capacity/mAh g ⁻¹	The initial discharging capacity/mAh g ⁻¹	The initial coulombic efficiency (ICE)/%
STD	189.3	182.3	96.3
5 TTFP	210.5	191.6	91.0
10 TTFP	254.4	205.5	80.8
20 TTFP	244.1	194.5	79.7

Table S2 Capacity retention data of TTFP batteries with different contents at 4.2 V

Samples	The 1 st discharging capacity/mAh g ⁻¹	The 100 th discharging capacity/mAh g ⁻¹	Capacity Retention (CE)/%
STD	184	130	69
5 TTFP	188.4	130.5	70.9
10 TTFP	219.6	162.3	73.9
20 TTFP	205.6	155.4	75.6

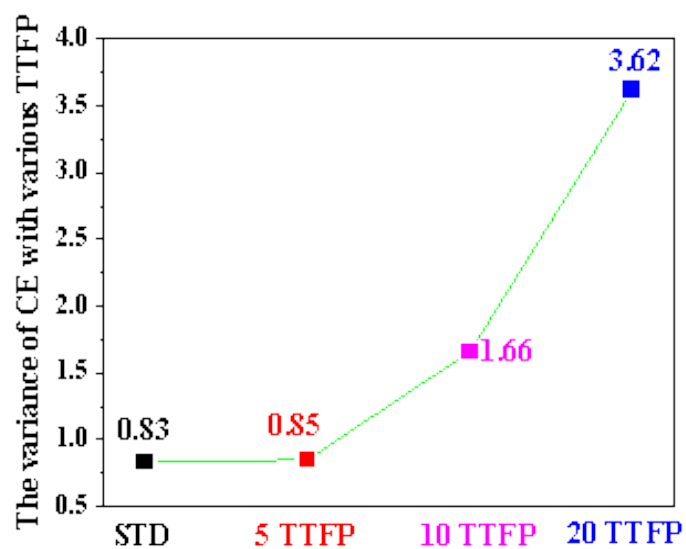


Figure S1 The variance of CE containing different percentages of TTFP at 4.2 V.

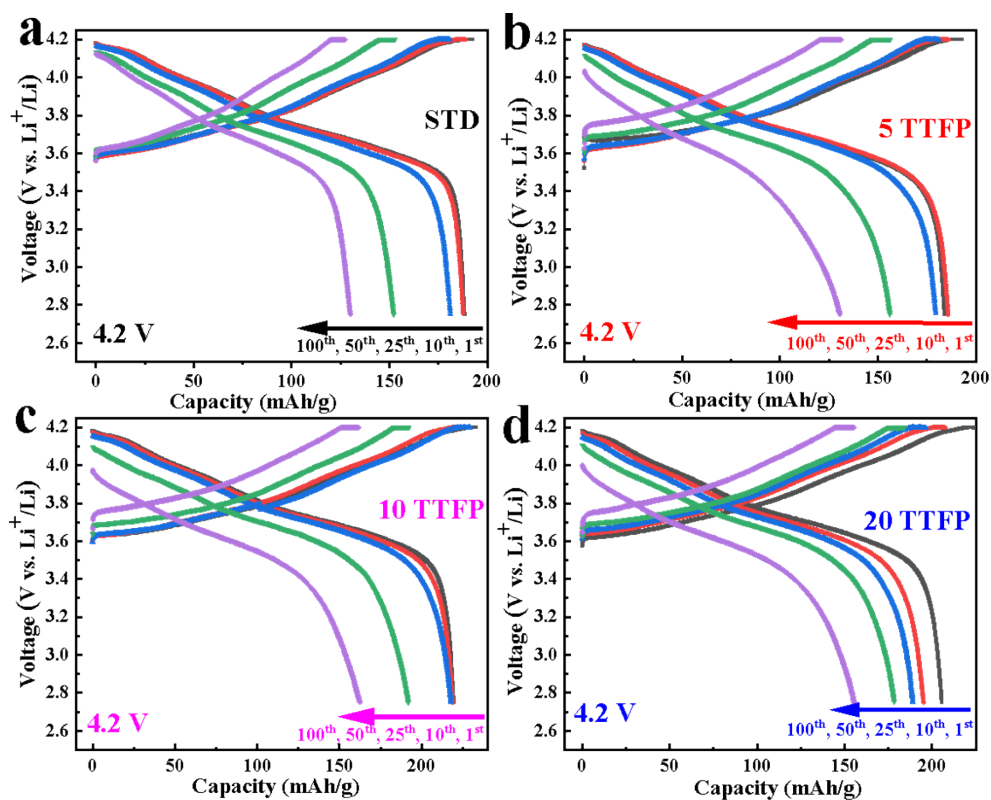


Figure S2 Multiple selected charge/discharge curves of cells containing different percentages of TTFP at 4.2 V:

(a) STD; (b) 5 TTFP; (c) 10 TTFP; (d) 20 TTFP

Table S3 the first charge/discharge and Coulombic efficiency data for cells containing different percentages of

TTFP at 4.5 V

Sample	Initial charging capacity /mAh g ⁻¹	Initial discharging capacity /mAh g ⁻¹	Initial Coulombic Efficiency (ICE)/%
STD	232.5	181.2	77.9
10 TTFP	240.1	229.4	95.5

Table S4 Capacity retention data of batteries with and without TTF at 4.5 V

Samples	The 1 st discharging capacity/mAh g ⁻¹	The 100 th discharging capacity/mAh g ⁻¹	Capacity Retention (CE) /%
STD	194.8	118.7	60.93
10 TTFP	229.4	150.0	65.39

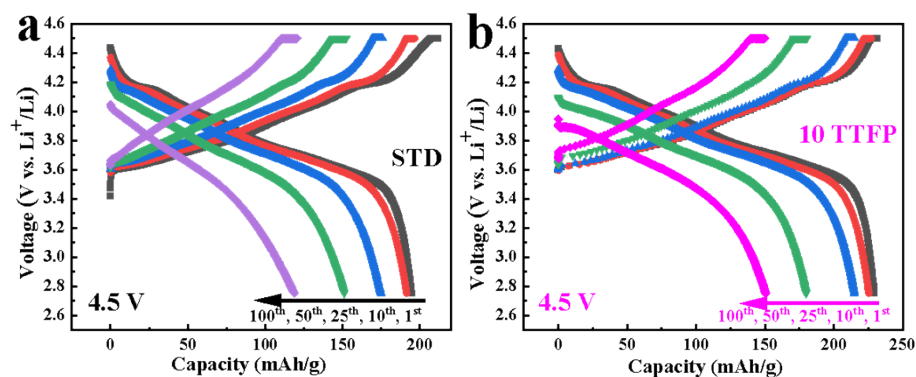


Figure S3 Multiple selected charge/discharge curves of cells containing different percentages of TTFP at 4.5 V:

(a) STD; (b) 10 TTFP

Table S5 Data on the 3rd cyclic voltammetry curves redox potential with and without TTPB

Sample	ψ_1/V	ψ_2/V	ψ_{12}/mV	ψ_3/V	ψ_4/V	ψ_{34}/mV
STD	3.59	3.88	290	4.27	4.07	200
10 TTFB	3.79	3.65	140	4.23	4.11	120

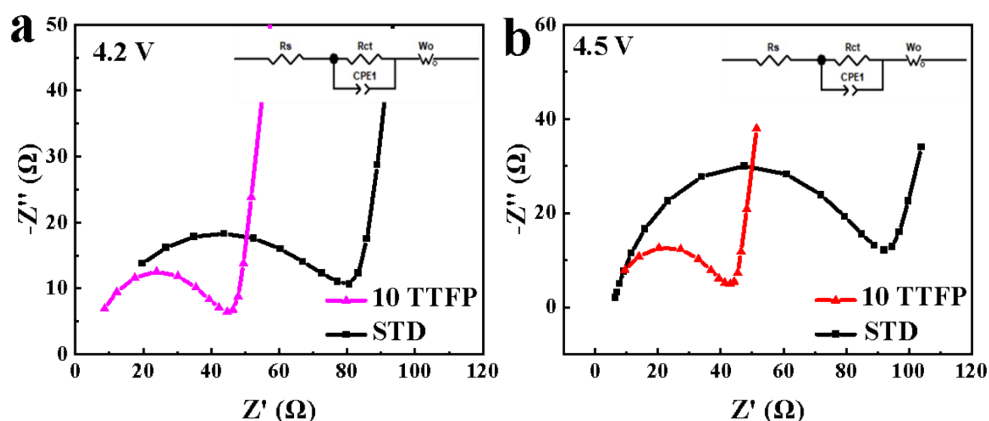


Figure S4 Post-cycling AC impedance spectra of cells with and without TTFP at different voltages:

(a) 4.2 V; (b) 4.5 V



The video of
combustion test

The video S1



The video of
combustion test

The video S2