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Ultrahigh Li-ion Conductive Single-ion Polymer Electrolyte Containing Fluorinated Polysulfonamide for Quasi-solid-state Li-ion Batteries

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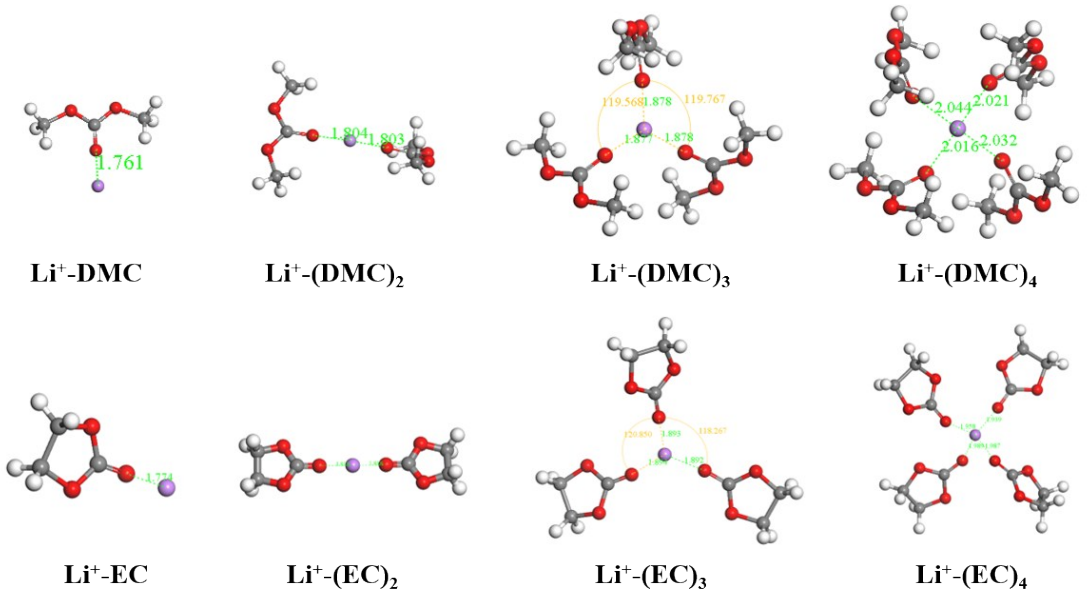

Fig. S1 Optimized geometries of the Li^+-DMC and Li^+-EC complex from GGA-PBE calculations. Purple spheres represent Li, red-O, white-H, grey-C.

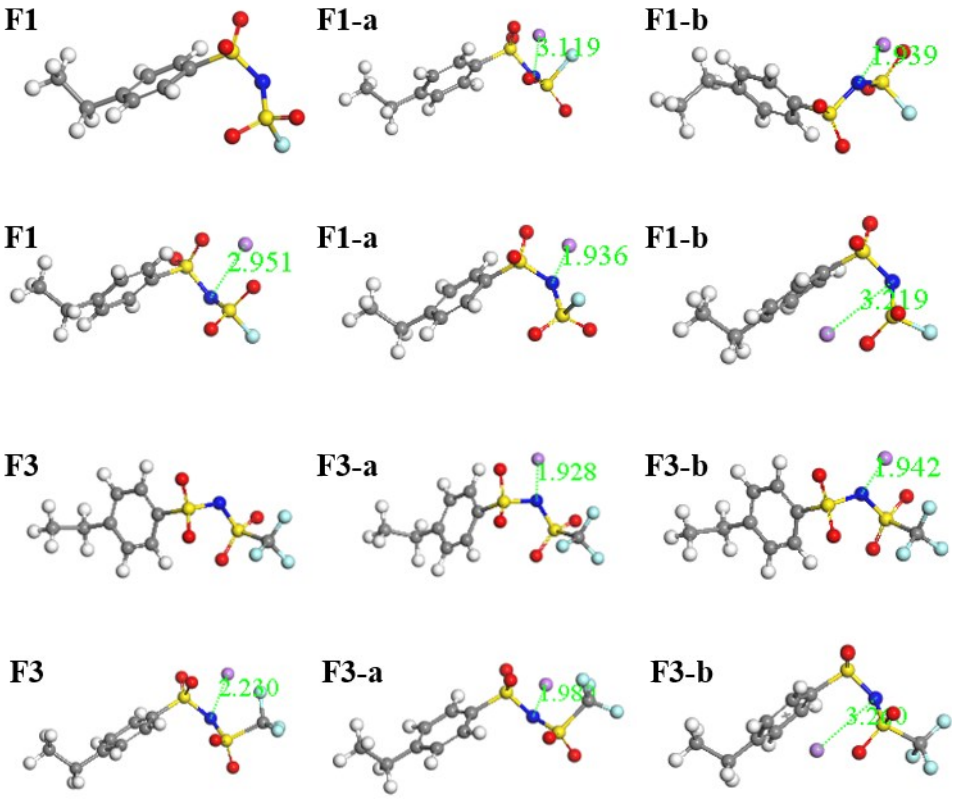

Fig. S2 Interaction types between Li^+ and the anions of LiSFSI (F1) and LiSTFSI (F3). Blue spheres represent N, yellow-S, cyan-F, red-O, white-H, grey-C.

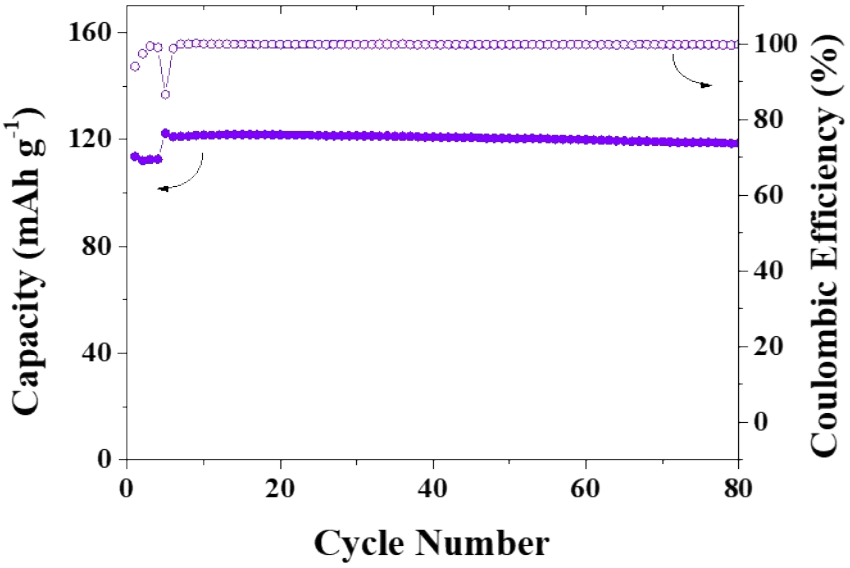

Fig. S3 Cycle performance of Li|LFPP-4/2/1@PVDF SIPE|LFP batteries at 1.0 C.

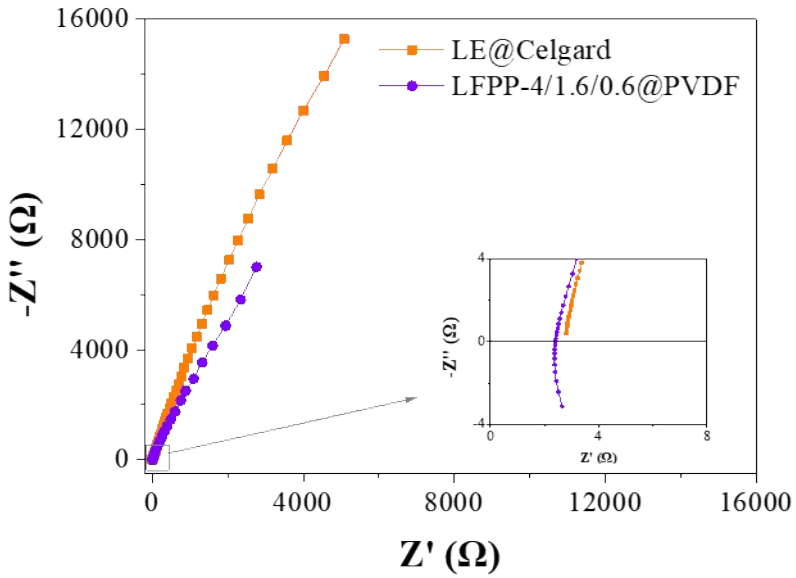

Fig. S4 EIS curves of SS|LE@Celgard|SS and SS|LFPP-4/1.6/0.6|SS cells at 30 °C.

Table S1 Calculation result of ionic conductivity of LFPP-4/2/1@PVDF SIPE and PP with liquid electrolyte

	Thickness (μm)	R (Ω)	σ(mS cm^{-1})
LFPP-4/1.6/0.6@PVDF SIPE	252	2.17	5.81
LE@Celgard	25	2.8	0.47

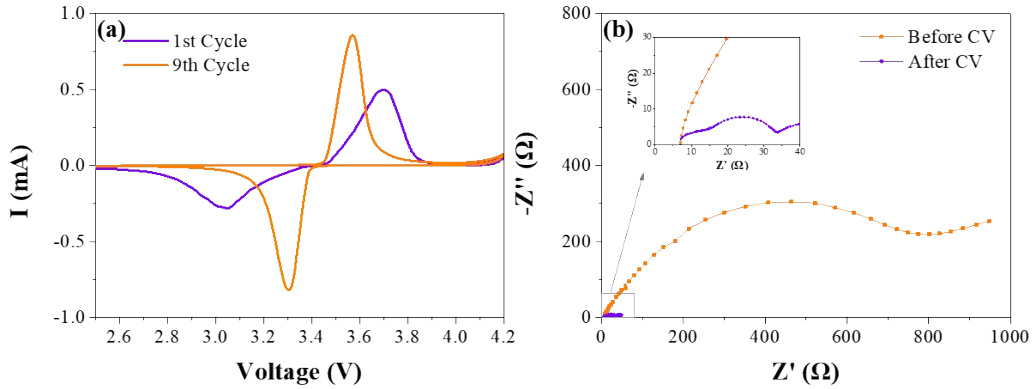

Fig. S5 The initial and 9th cycles of cyclic voltammetry curves (left) and EIS curves of the Li|LFPP-4/2/1@PVDF SIPE|LFP battery.

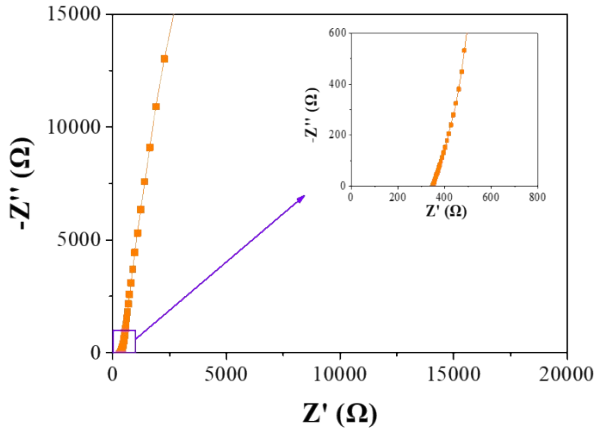

Fig. S6 The EIS curve of the LFPP-4/1.6/0.6 SIPE in an electrolytic tank with platinum plate electrodes as working electrode and opposite electrode.

Table S2 Calculation result of ionic conductivity of LFPP-4/2/1@PVDF SIPE with platinum plate electrodes as working electrode and opposite electrode.

	L (mm)	S (cm^2)	R (Ω)	σ ($mS\ cm^{-1}$)
LFPP-4/1.6/0.6@PVDF SIPE	12.0	0.4	348	8.62