

Electronic supplementary information

Advanced Construction Strategy of All-solid-state Lithium Batteries with Excellent Interfacial Compatibility and Ultralong Cycle Life

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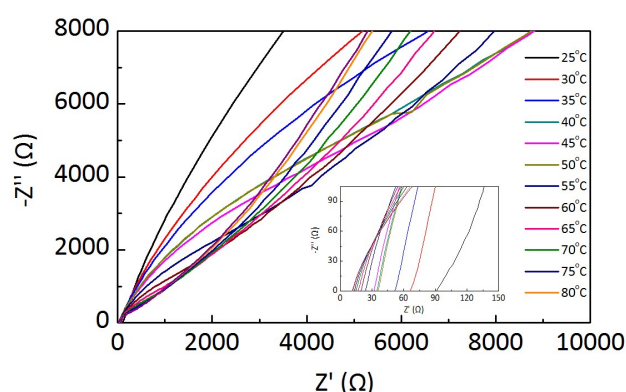


Fig. S1 EIS plots of CE at different temperatures.

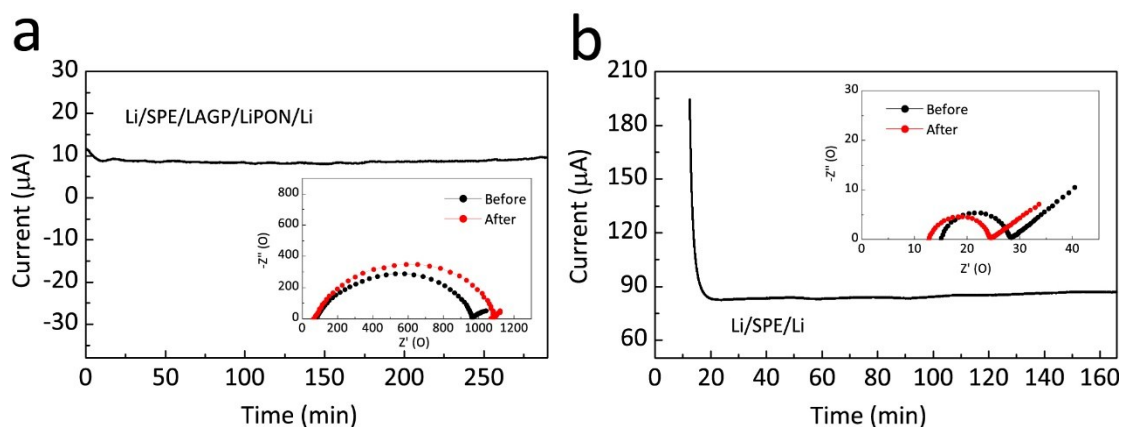


Fig. S2 DC polarization of a) Li/SPE/LAGP/LiPON/Li cell and b) Li/SPE/Li cell. The inset shows EIS spectra before and after perturbation.

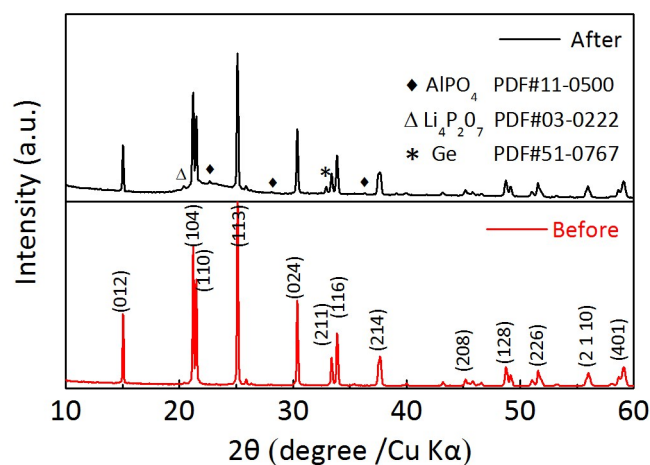


Fig. S3 XRD pattern of LAGP pellets before and after being contacted with lithium metal for 72h at 60°C.

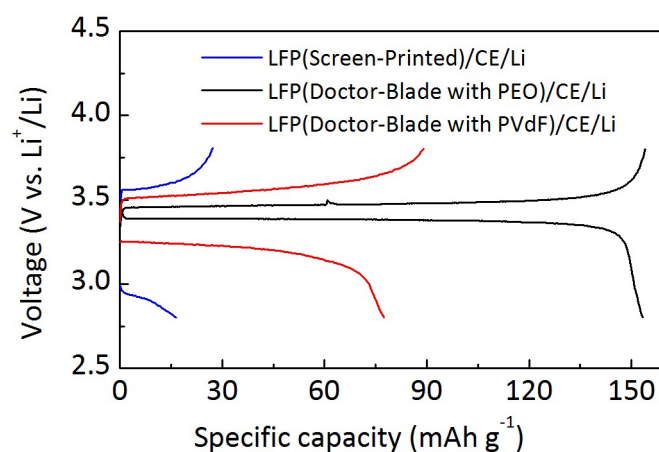


Fig. S4 The initial charge-discharge curve of LFP/Li ASSLB with different cathode preparation methods.

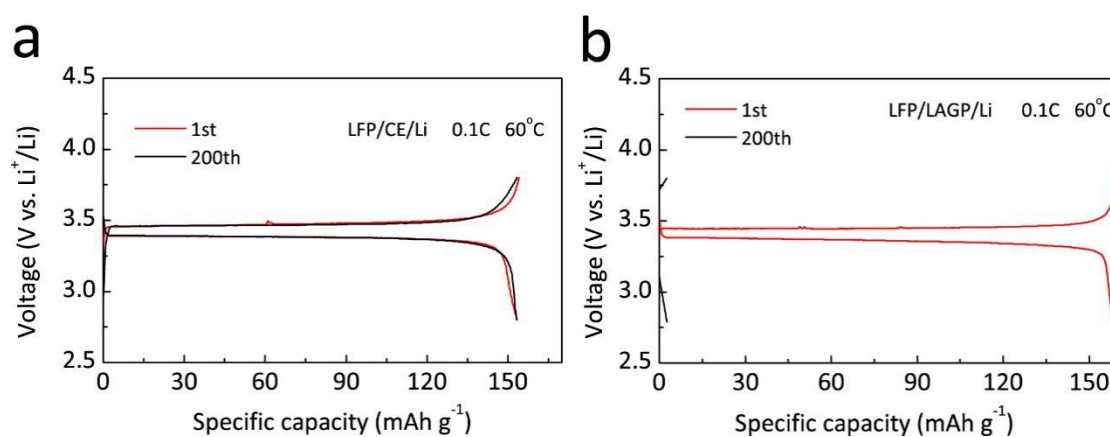


Fig. S5 The charge/discharge curves of cell a) LFP/CE/Li and b) LFP/LAGP/Li at 0.1 C

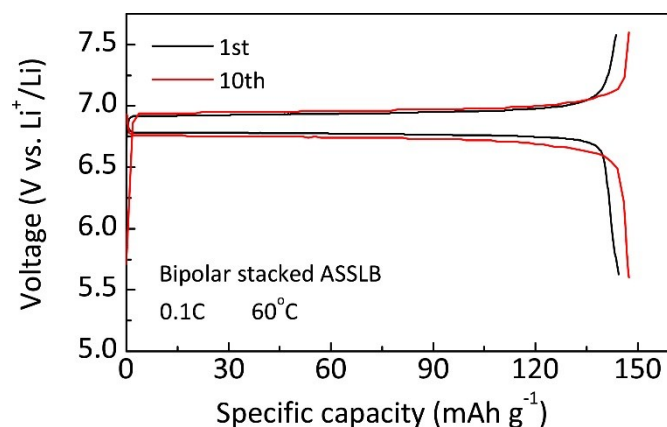


Fig. S6 The charge-discharge curve of bipolar stacked ASSLB

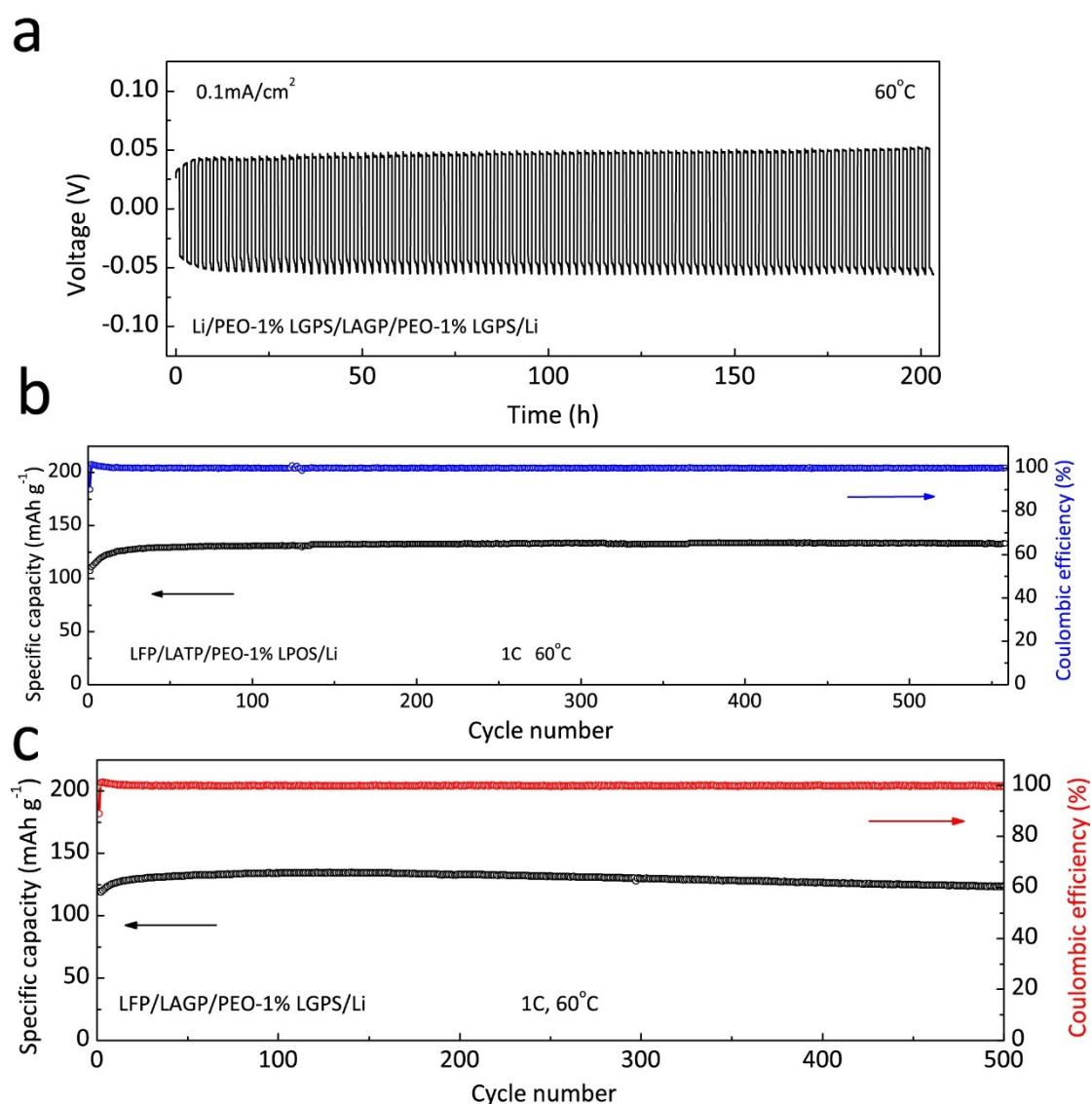


Fig. S7 a) Voltage profiles vs. cycling time at 0.1 mA cm^{-2} of Li/PEO-1%LGPS/LAGP/PEO-1%LGPS/Li symmetric cell. The capacity retention of c) LFP/LATP/PEO-1%LPOS/Li cell c) LFP/LAGP/PEO-1%LGPS/Li cell at 1 C.

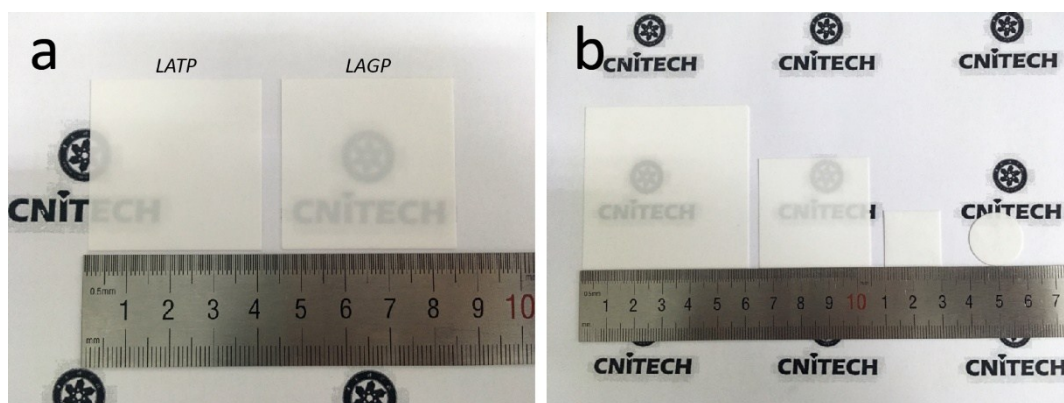


Fig. S8 a) LATP and LAGP pellets. b) LAGP pellets with various shapes

Table S1. Thermal properties of PEO-*x*%LPOS polymer electrolyte (*x*=0, 1, 5, 10%wt).

Electrolytes	T_g (°C)	T_{m1} (°C)	T_{m2} (°C)	$T_{5\%weight\ loss}$ (°C)
PEO-0% LPOS	-34.64	41.20	57.98	369.61
PEO-1% LPOS	-36.77	36.92	55.02	357.76
PEO-5% LPOS	-35.62	38.24	55.68	351.91
PEO-10% LPOS	-35.63	38.24	55.52	341.35

Table S2. Electronic conductivity and ionic conductivity of the LFP cathode with PVdF and PEO

	LFP cathode with PVdF		LFP cathode with PEO	
	$\sigma_{Electronic}$ (S cm ⁻¹)	σ_{Ionic} (S cm ⁻¹)	$\sigma_{Electronic}$ (S cm ⁻¹)	σ_{Ionic} (S cm ⁻¹)
25°C	1.89×10^{-3}	1.18×10^{-4}	1.62×10^{-3}	1.21×10^{-4}
60°C	2.82×10^{-3}	1.39×10^{-4}	2.29×10^{-3}	7.06×10^{-4}