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Supporting Information

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Supporting information

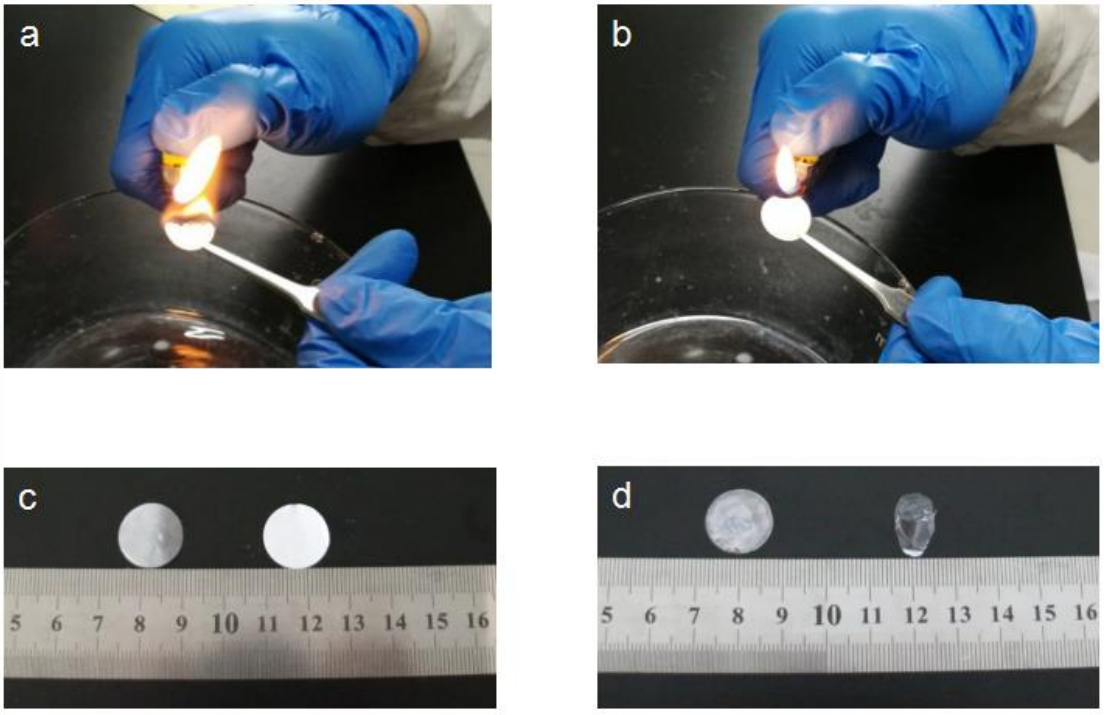

Figure S1. Combustion testing of a) Commercial PE separator, b) PGE membrane. Comparison photographs of the thermal shrinkage of the 3D cross-linking membrane (left) and a commercial separator (right) c)before and d) after exposure to 150 ℃ for 10 min.

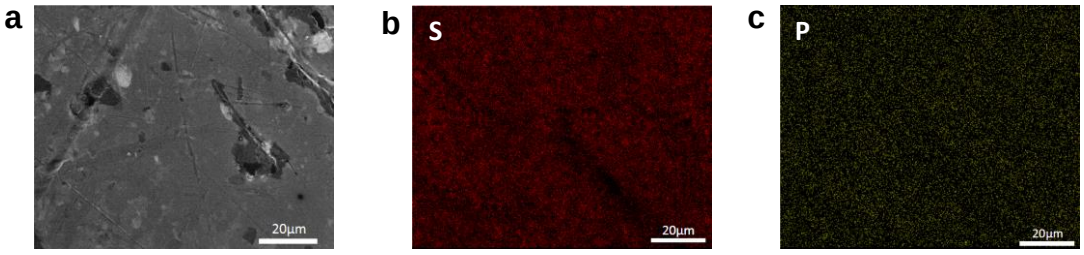

Figure S2. a) SEM of morphology of GPE; b) EDS map of P-K; c) S-K of surface section.

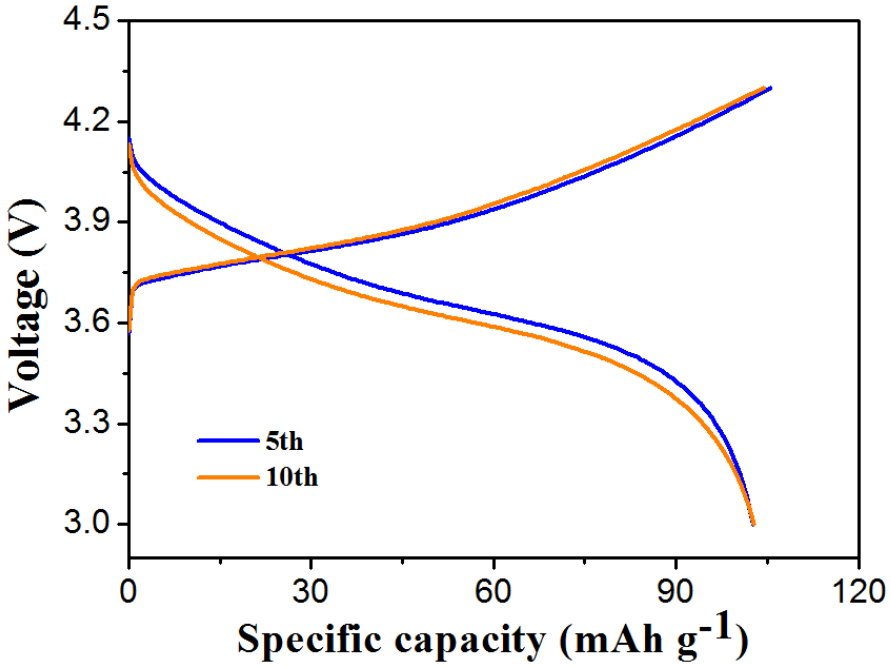

Figure S3. Charging-Discharging curves of the fifth and tenth cycle of Li|NCM at 0.5C at 25 ^{o}C. The charging-discharging range is 3.0V-4.3V.

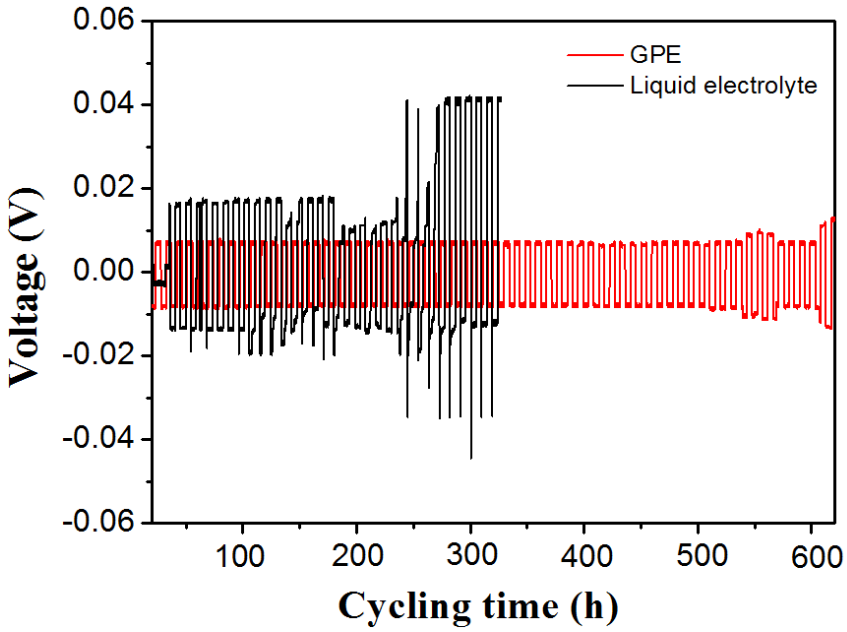

Figure S4. Polarization test by using Li|GPE|Li symmetric cells and liquid electrolyte

	Ionic conductivity (mS/cm)
PEGDA:ETPTA=1:1	0.04
PEGDA:ETPTA=3:2	0.25
PEGDA:ETPTA=4:1	0.56
ETPTA	0.18

Figure S5. Ionic conductivity of different polymer constitution.

	$LiPF_6$	LiTFSI	Dual Li salts
Ionic conductivity (mS/cm)	0.12	0.16	0.56

Figure S6. Ionic onductivity of different Li salt constitution.

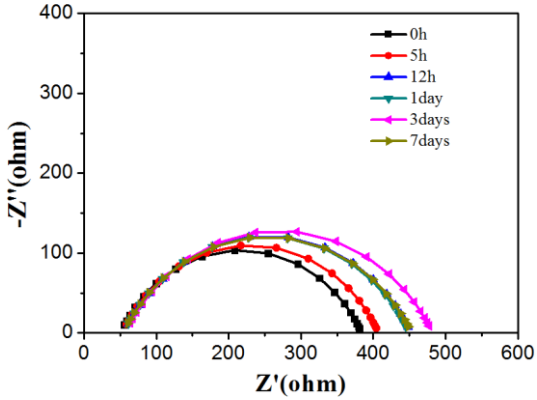

Figure S7. Impedance response with time evolution of the Li|GPE|Li.

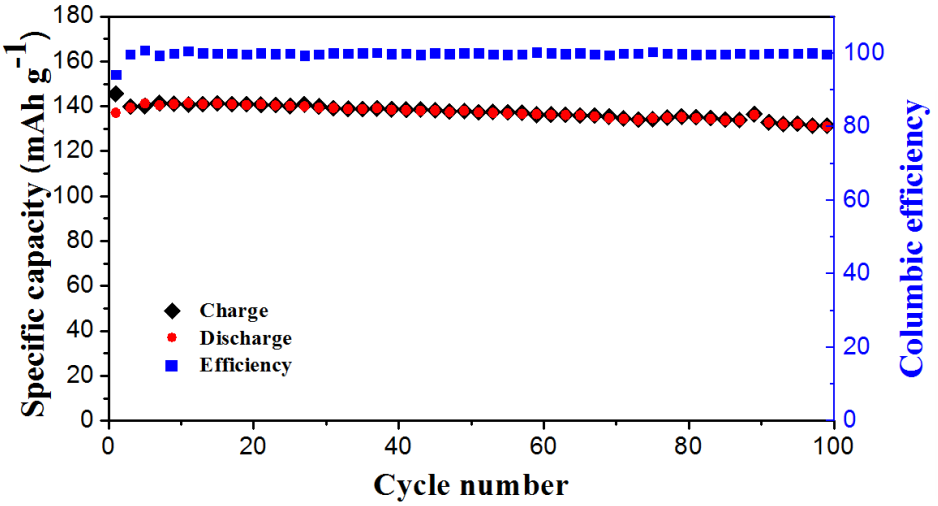

Figure S8. Battery performance of PEGDA based GPEs at the rate of 0.2 C at 20 ℃.

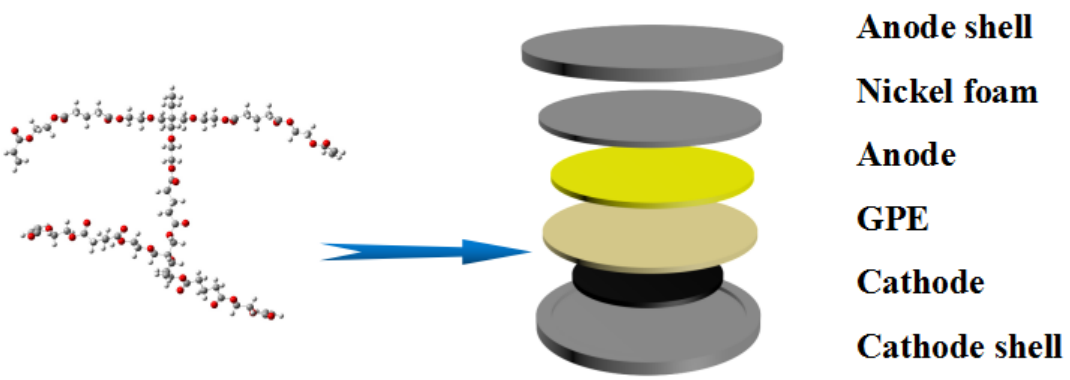

Figure S9. Structural illustration of GPE battery.

	Thermal safety (°C)	Ion Conductivity(mS/cm)	Li^+ transference
PVA-CN solid electrolyte[1]	160	0.3 at room temperature	0.57
PPC polymer electrolyte[2]	-	0.3 at 20°C	-
PINs[3]	250	0.532 at 20°C	-
PVDF/PEO SPE[4]	158	0.303 at room temperature	-
PVDF/HEC/PVDF[5]	290	0.88 at room temperature	0.57
TPU/PEO SPE[6]	314	0.53 at 60°C	0.31
PEGDA-ETPTA GPE	280	0.56 at room temperature	0.72

Figure S10. Physical and electrochemical properties of our produced GPE and other GPEs.

References

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