

Supplementary materials for

Crosslinked gel polymer electrolyte based on multiply-epoxy groups enable conductivity and electrochemical performance for Li-Ion Batteries

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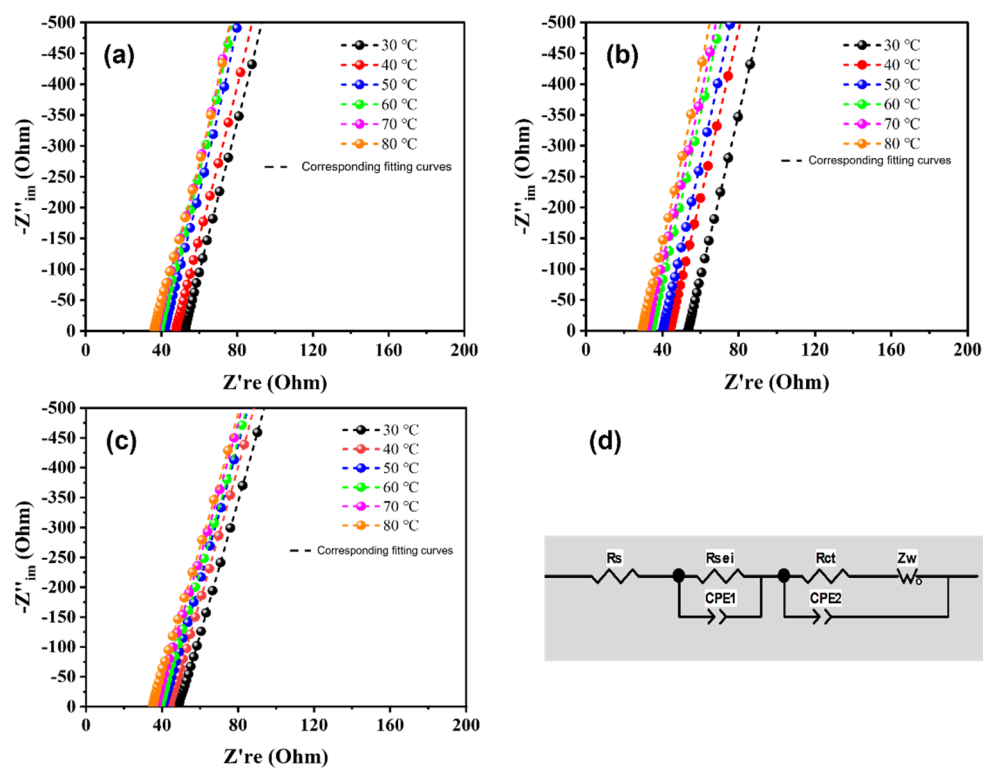


Figure S1. Nyquist plots of as-prepared C-GPE-1(a), C-GPE-2(b), and C-GPE-3(c), and corresponding an equivalent circuit(d).

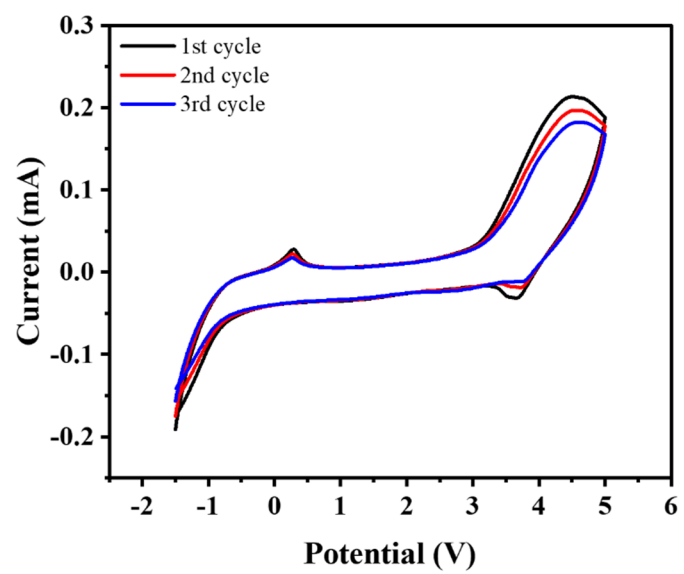


Figure S2. CV profiles of as-prepared C-GPE-4.

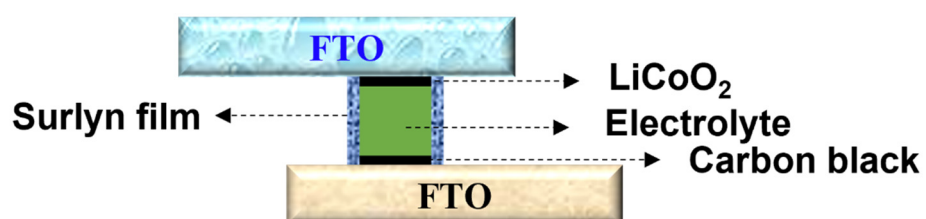


Figure S3. The schematic illustration of an asymmetric dummy cell.

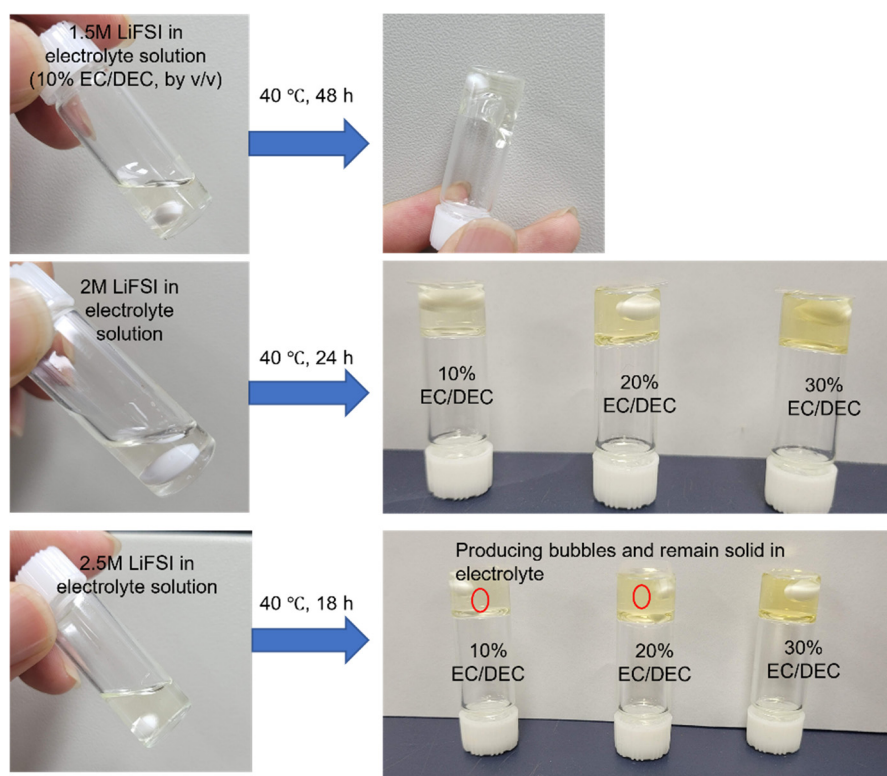


Figure S4. The digital photos of in-situ polymeric C-GPEs with varies concentrated LiFSI.

Table S1. Comparison of electrochemical properties of polymer electrolyte with epoxy group from reported works.

Electrolyte components	Ionic conductivity (S/cm at 30 °C/ RT ^a)		LSV (V, Li/Li ⁺)	Battery performances	Ref.
TMPEG, NPEG, LiTFSI	1.10×10 ⁻⁴		5.4	LFP, 144.8 mAh/g, 0.2C	[1]
PEE, LiTFSI, LiDFOB	2.36×10 ⁻³		4.5	NMC622, 160 mAh/g, 0.5C	[2]
NGDE, LiFSI	1.57×10 ⁻³		4.0	LFP, 131 mAh/g, 0.2C	[3]
PEGDGE, LiTFSI, LiBF ₄	1.10×10 ⁻⁴		5.5	LFP, 160.2 mAh/g, 0.05C	[4]
GMA, OE, LiClO ₄	HPGO-70	2.26×10 ⁻⁶	4.0-4.5	Li, 99 mAh/g, 0.1C	[5]
	PGO-70	2.58×10 ⁻⁷			
PGTE, LiDFOB	4.16×10 ⁻⁴ at 60 °C		5.0	LFP, 135.2 mAh/g, 0.2C	[6]
C-GPE-2, LiFSI	0.23×10 ⁻³		5.19	LFP, 161.3 mAh/g, 0.1C	This work

Note: 1) ^a Room temperature (RT)

2) LiFePO₄ (LFP), Trimethylolpropane triglycidyl ether (TMPEG), Poly (ethylene glycol) diamine (NPEG), Lithium bis(trifluoromethane)sulfonilimide (LiTFSI), Pentaerythritol glycidyl ether (PEE), LiNi_{0.6}Mn_{0.2}Co_{0.2}O₂ (NMC622), Lithium difluoro(oxalate)borate (LiDFOB), Neopentyl glycol diglycidyl ether (NGDE), Poly(ethylene glycol) diglycidyl ether (PEGDGE), Lithium tetrafluoroborate (LiBF₄), Glycidyl methacrylate (GMA), Oligo (ethylene oxide) methyl ether methacrylate (OE), Lithium perchlorate (LiClO₄), Polymerized glycerin triglycidyl ether (PGTE)

Table S2. The composition of the as-prepared crosslinked-gel polymer electrolyte in this work

Crosslinked-Gel Polymer electrolytes (C-GPEs) names	ESO (mL)	LiFSI (g)	EC/DEC (mL)
C-GPE-1	2	0.748	0.2
C-GPE-2			0.4
C-GPE-3			0.6

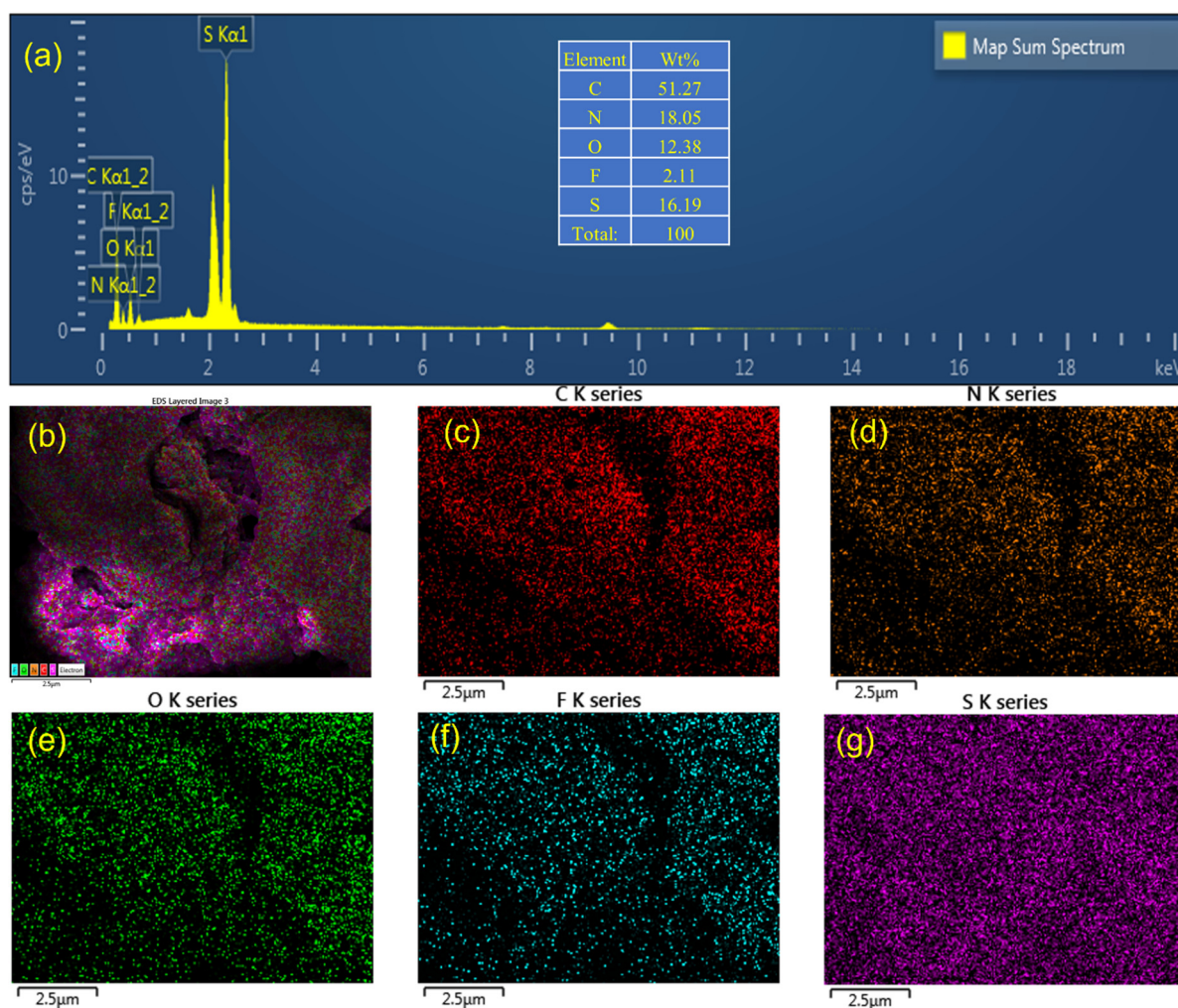


Figure S5: (a-b) Selected area of graphite anode of C-GPE-2 electrolyte based LIB (inset shows the wt% of elemental C, N, O, F, and S), and (b-g) EDS elemental mapping of C, N, O, F, and S, respectively. The graphite anode was recovered after 300 CD cycles.

Reference

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