Supporting Information

SiO_2-Alginate-Based Gel Polymer Electrolytes for Zinc-Ions Batteries

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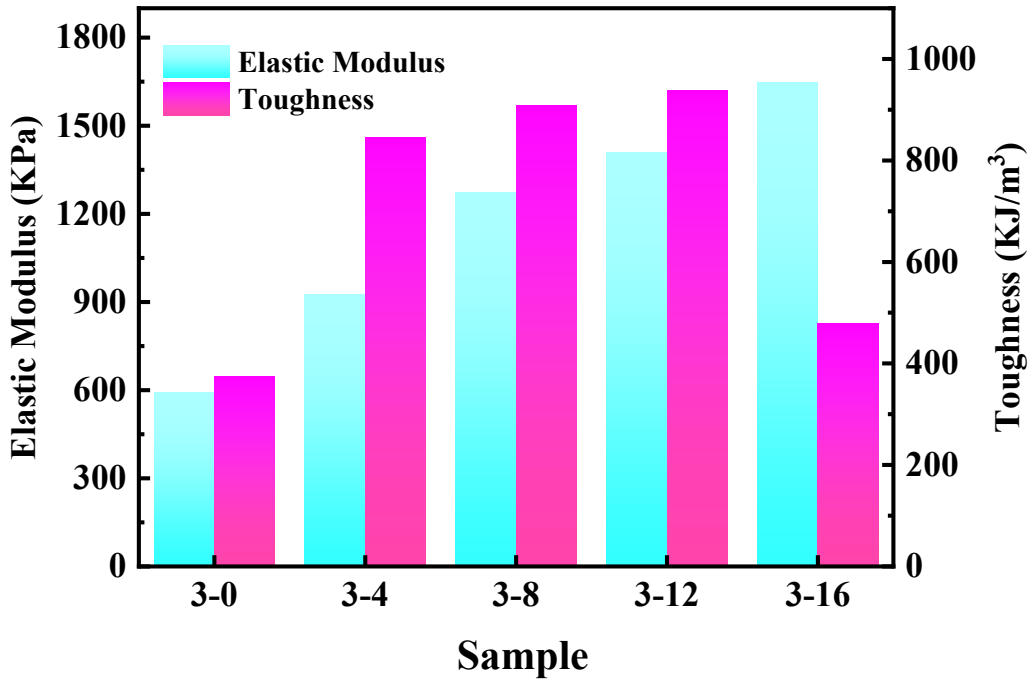

Figure S1. Elastic modulus and toughness of GPE hydrogel matrix.

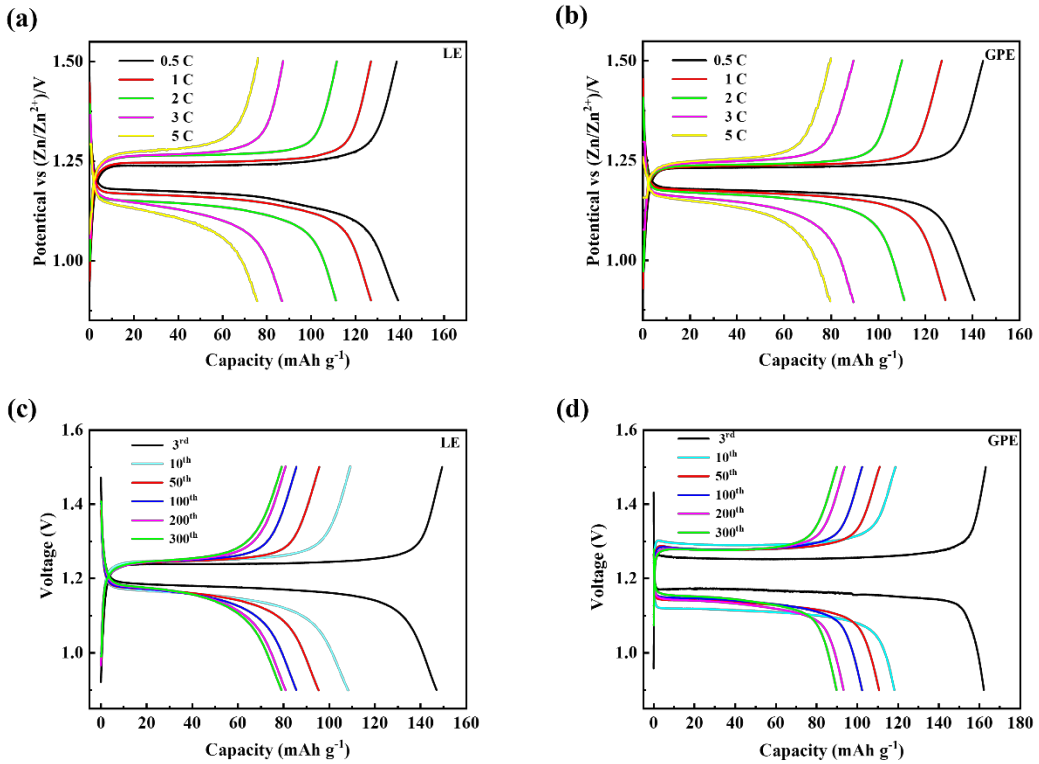

Figure S2. Charge/discharge profiles of (a) Zn/LE/LFP and(b) Zn/GPE/LFP, respectively. Charge/Discharge profiles of (c) Zn/LE/LFP and (d) Zn/GPE/LFP batteries at 3rd, 10th, 50th, 100th, 200th and 300th at the current density of 1 C; cut of voltage 0.9–1.5 V (vs. Zn/Zn^{2+}).

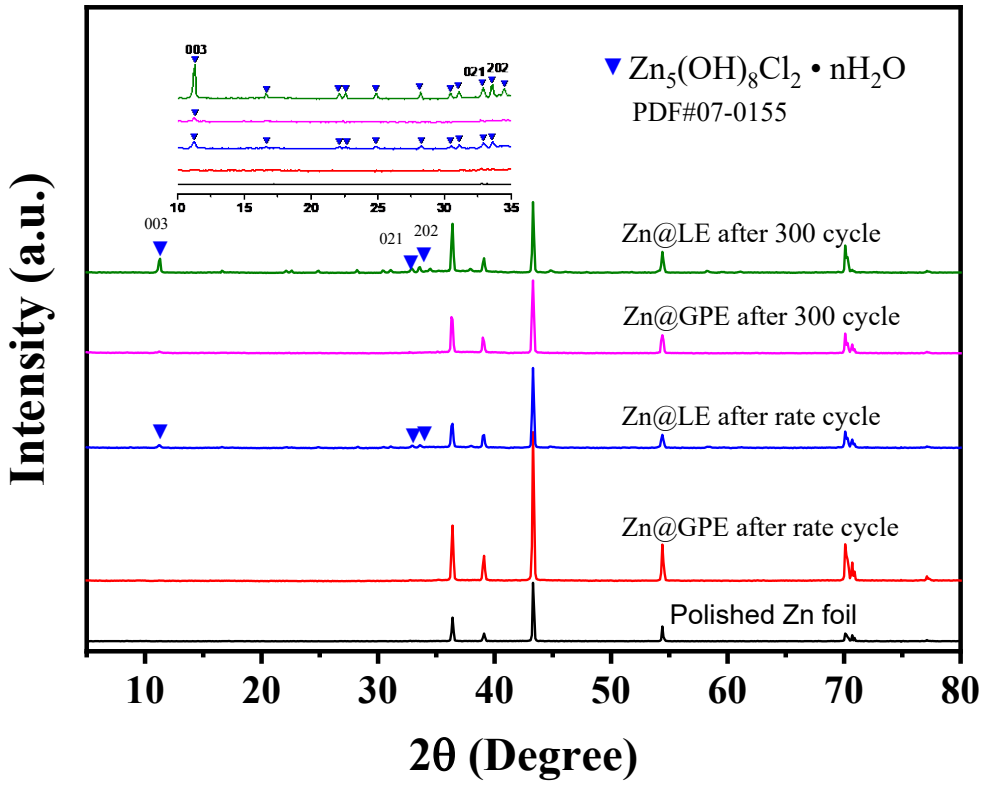

Figure S3. XRD patterns of the anodes of the Zn//LFP batteries after 300cycles at 1C.

Table S1. Comparison of the performance of zinc-ion polymer electrolytes

gel polymer electrolyte	Salts	Ionic conductivities (S cm^{-1})	Ref.
SiO_2-SA GPE	5M $ZnCl_2$+4M LiCl	1.14×10^{-2}	This work
PVA	3M LiCl+2M $ZnCl_2$ +0.4M $MnSO_4$	0.897×10^{-2}	[46]
Guar gum	2M $ZnSO_4$+0.1M $MnSO_4$	1.07×10^{-2}	[47]
PEO	$ZnCl_2$	$2\sim4\times10^{-3}$	[48]
Poly-ε-caprolactone	$Zn(CF_3SO_3)_2$	8.8×10^{-4}	[49]