Highly reversible and long-lived zinc anode assisted by polymer-based hydrophilic coating

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Supplementary materials

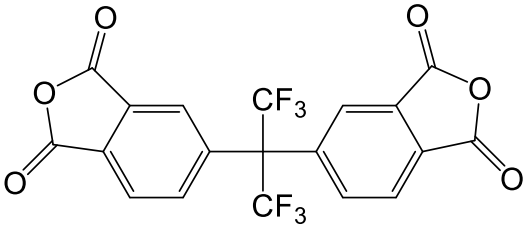

Fig. S1 The chemical structure of 4,4′-(hexafluoroisopropylidene)diphthalic anhydride (6FDA).

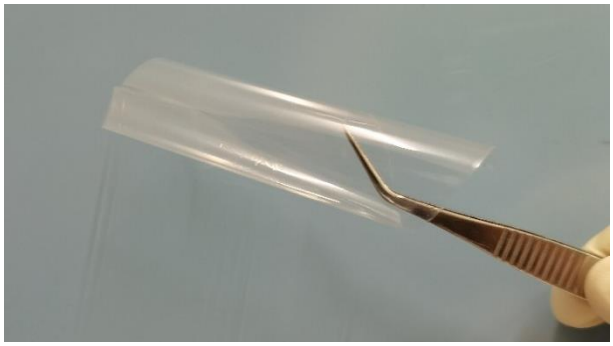

Fig. S2 Physical image of PVDF/6FDA in the curled state.

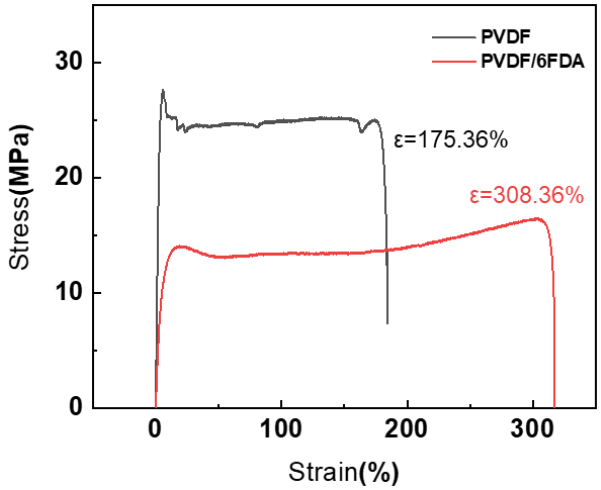

Fig. S3 Stress–strain curves of PVDF and PVDF/6FDA thin films with a thickness of 70 μm.

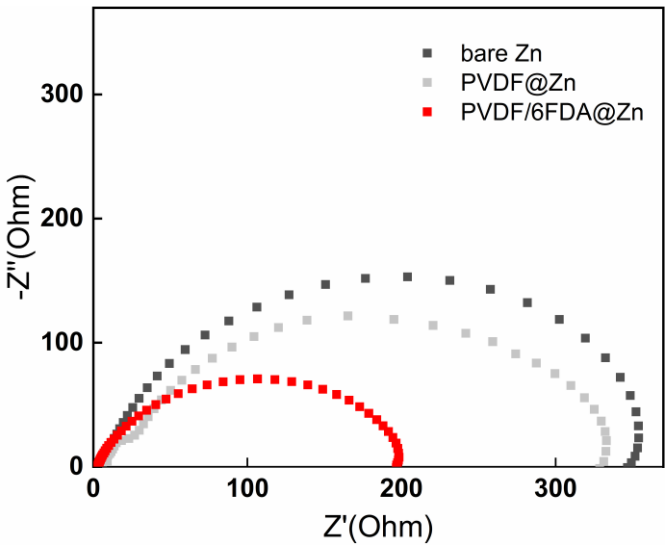

Fig. S4 Electrochemical impedance spectra of bare Zn, PVDF@Zn and PVDF/6FDA@Zn symmetric cells.

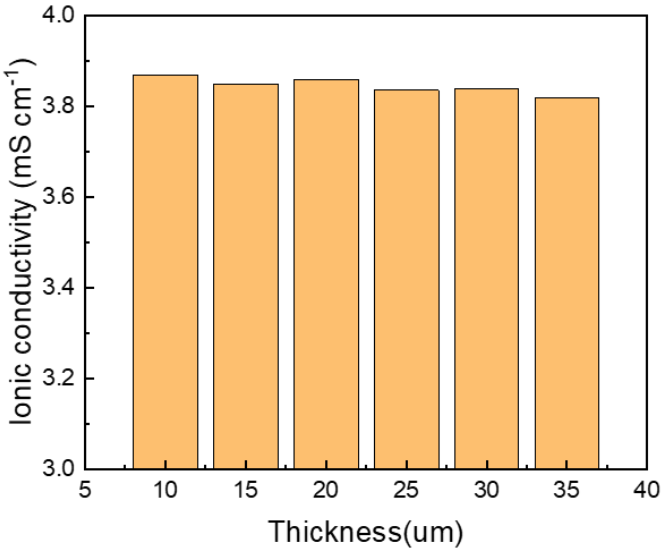

Fig. S5 Ionic conductivity of the ANFZ coating with various thickness.

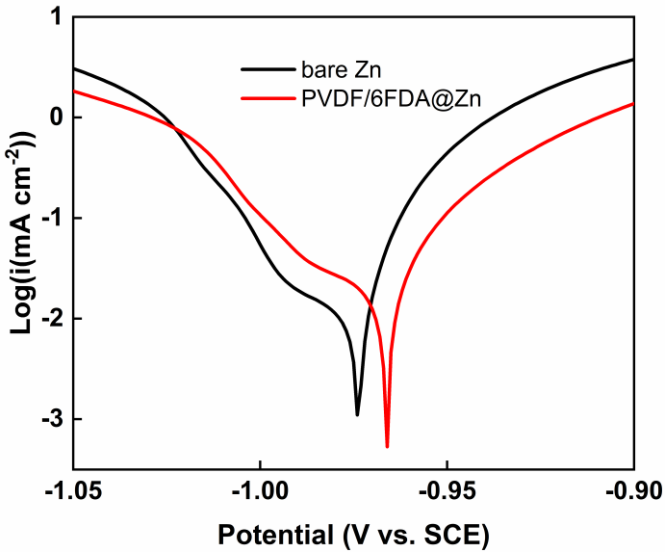

Fig. S6 Linear polarization diagrams of PVDF/6FDA@Zn and bare Zn in 2 mol·L^{-1} $ZnSO_4$.

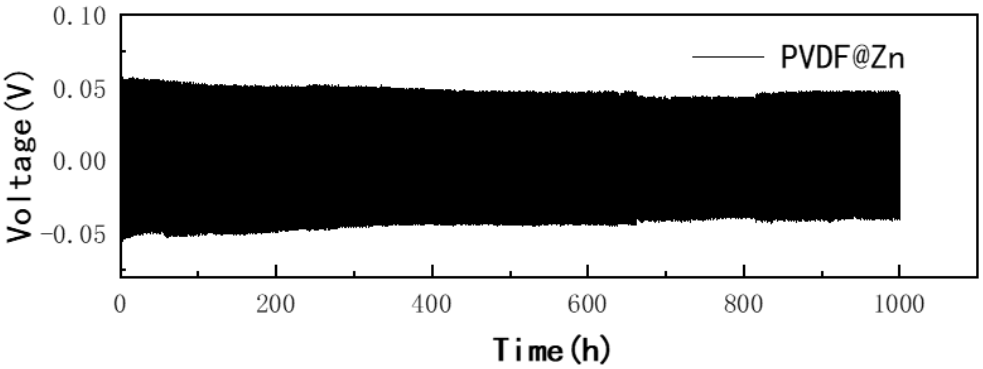

Fig. S7 Galvanostatic cycle test of PVDF@Zn symmetric cells at 0.5 mA·cm^{-2} and 0.25 mAh·cm^{-2}.

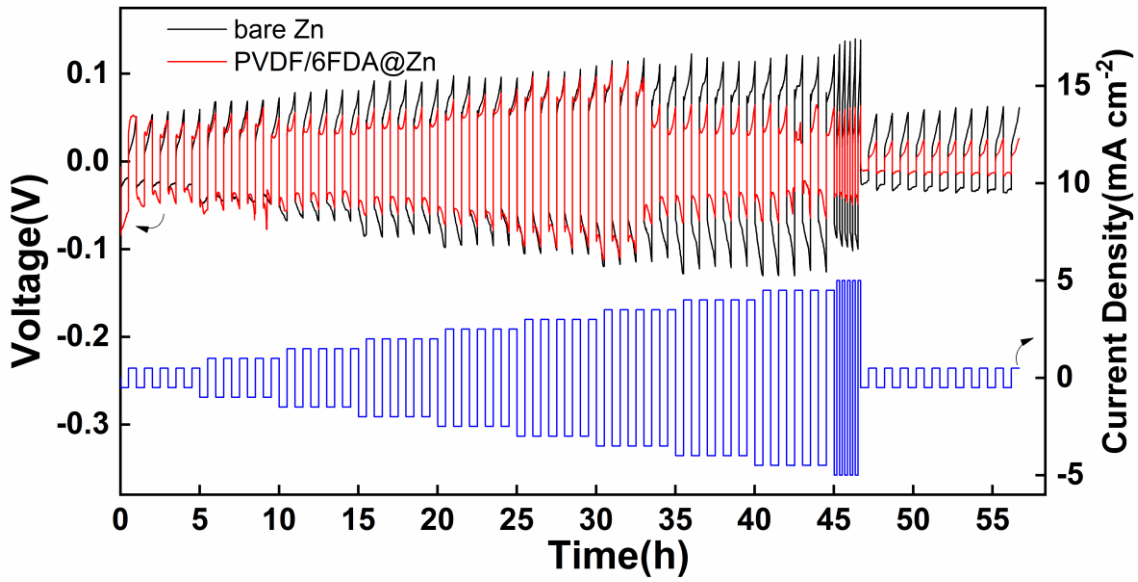

Fig. S8 Cycling performance of the symmetric cell at a current density ranging from 0.5 to 5 mA·cm^{-2}.

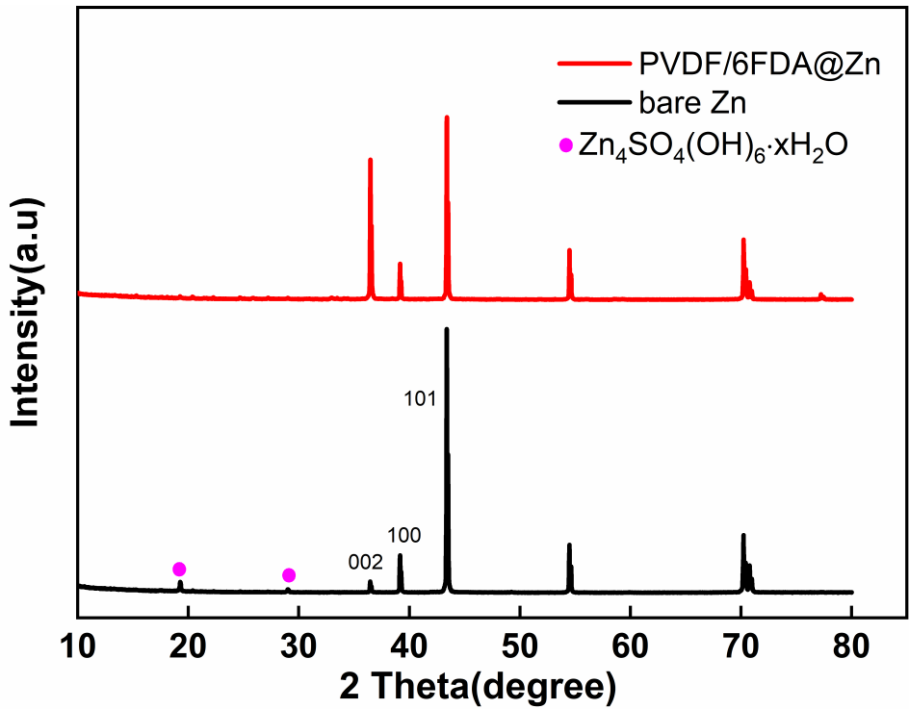

Fig. S9 XRD patterns of PVDF/6FDA@Zn and bare Zn electrodes after 100 cycles.

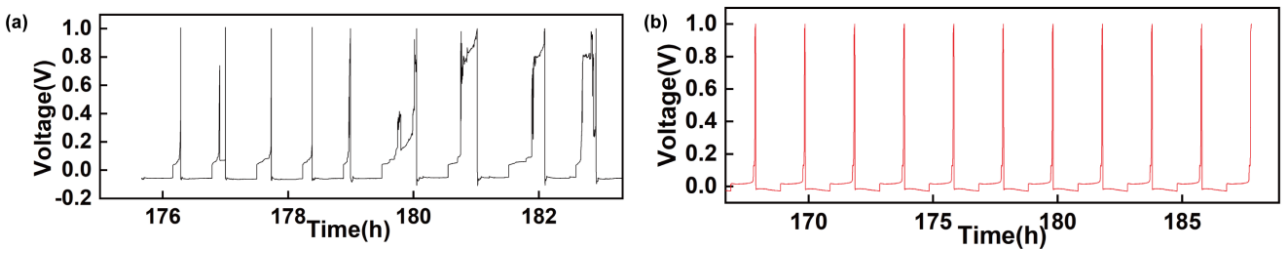

Fig. S10 Long cycle profiles of **(a)** bare Zn||Cu and **(b)** Zn||PVDF/6FDA@Cu half-cells at 0.5 mA·cm^{-2}.

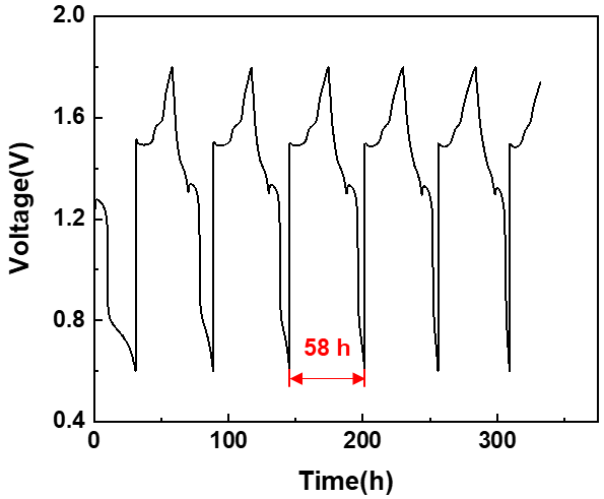

Fig. S11 Cycling curves of the PVDF/6FDA@Zn||MnO_2 full cell at 0.1 C.

Table S1 Various methods to optimize the Zn anode and their cyclic life performances

Zn anode	Current density/(mA·cm^{-2})	Area capacity/(mAh·cm^{-2})	Work time/h	Ref.
Cu foam@Zn	2	1	150	[S1]
Zn@Cu foam	2	1	300	[S2]
Zn@In	1	1	300	[S3]
Zn@Ag	0.25	0.125	1700	[S4]
Zn/Sn(2 0 0)	1	1	500	[S5]
Zn@ZnO	0.2	0.2	1000	[S6]
Zn@$CaCO_3$	0.25	0.05	800	[S7]
BTO@Zn	1	1	2000	[S8]
ANFZ@Zn	1	0.5	1000	[S9]
HAC@Zn	5	5	800	[S10]
GZn@Zn	0.2	0.1	1200	[S11]
NTP-C@Zn	0.5	0.5	900	[S12]
β-PVDF@Zn	0.25	0.05	2000	[S13]
PI@Zn	4	2	300	[S14]
PVDF/6FDA@Zn	0.5	0.25	5000	this work

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