Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

A dendrite-free zinc anode for rechargeable aqueous batteries

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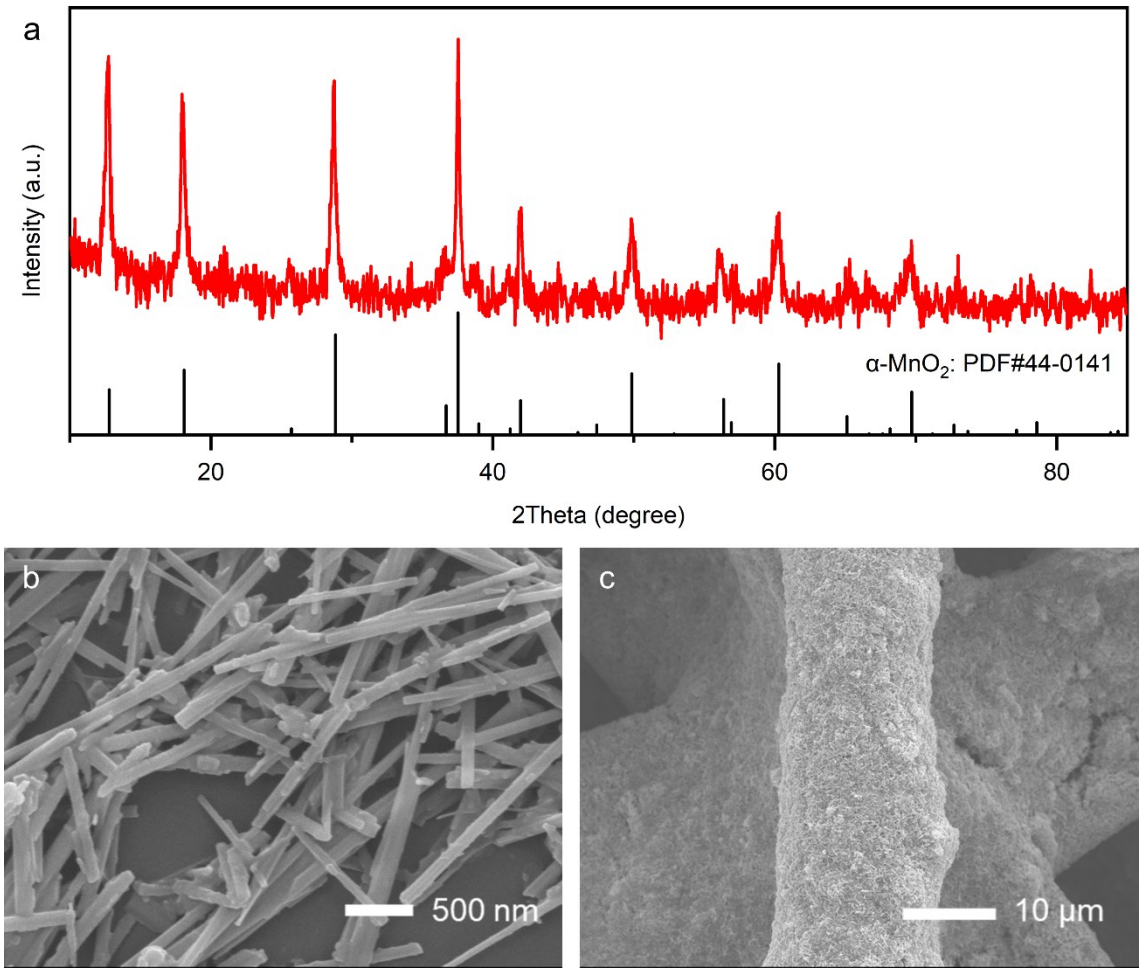

Fig. S1 (a) SEM image of MnO_2 nanorods. (b) SEM image of MnO_2 cathode by coating MnO_2 on carbon paper. (c) XRD pattern of MnO_2 nanorods.

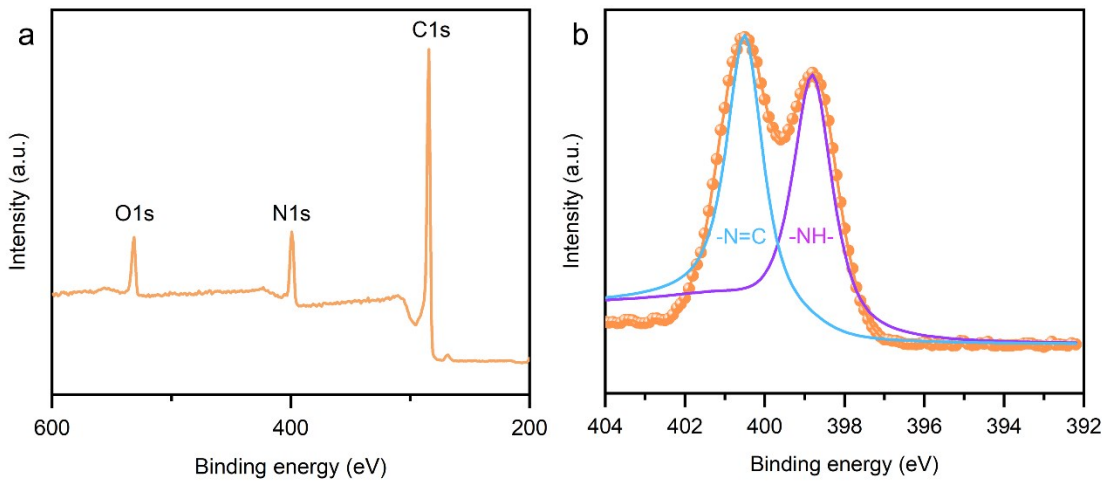

Fig. S2 (a) XPS survey spectra for PBI nanofibers. (b) N 1s XPS spectra of PBI nanofibers on Cu substrate.

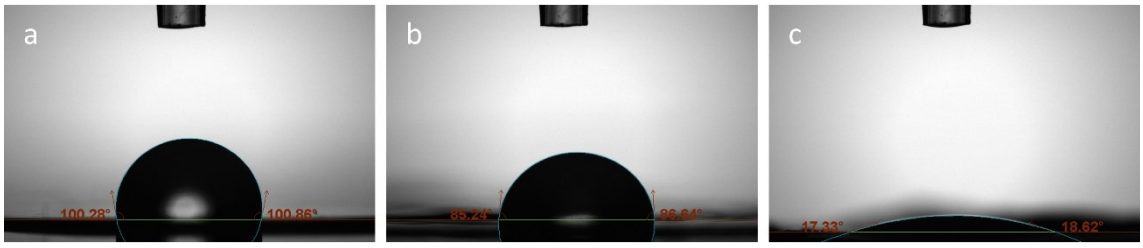

Fig. S3 Contact angle measurements of water drop on (a) Zn foil (about 100°), (b) Cu foil (about 85°) and (c) PBI Cu (about 18°).

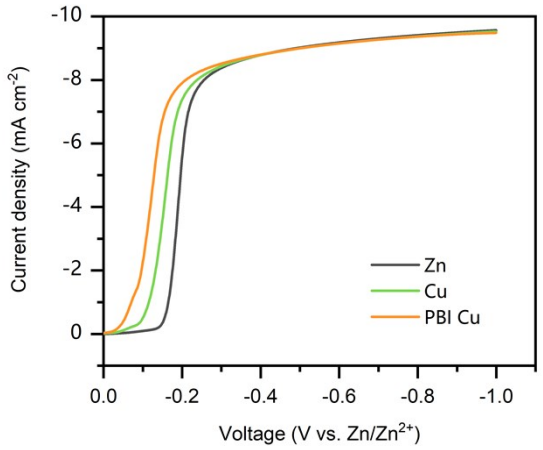

Fig. S4 LSV curves of different electrode in 1M $ZnSO_4$ electrolyte at a scan rate of 1 mV/s versus Zn metal.

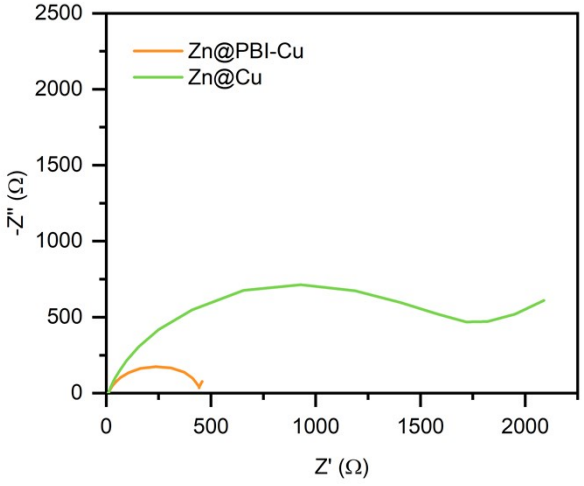

Fig. S5 Nyquist plots of symmetrical cells for the Zn@PBI-Cu and Zn@Cu at room temperature (25 ℃).

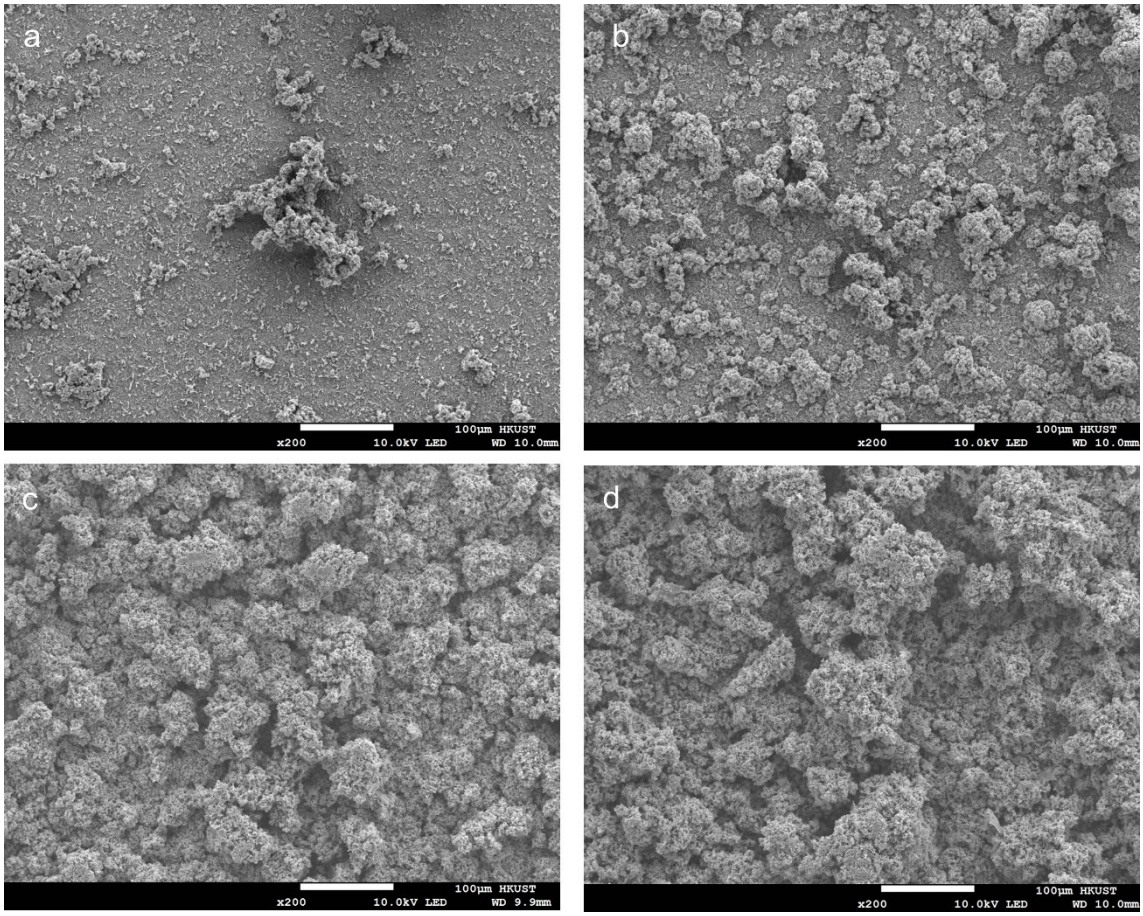

Figure S6. Morphology of Zn deposited on bare Cu with an areal capacity of (a) 1 mAh cm^{-2}, (b) 2 mAh cm^{-2}, (c) 5 mAh cm^{-2}, (d) 10 mAh cm^{-2}.

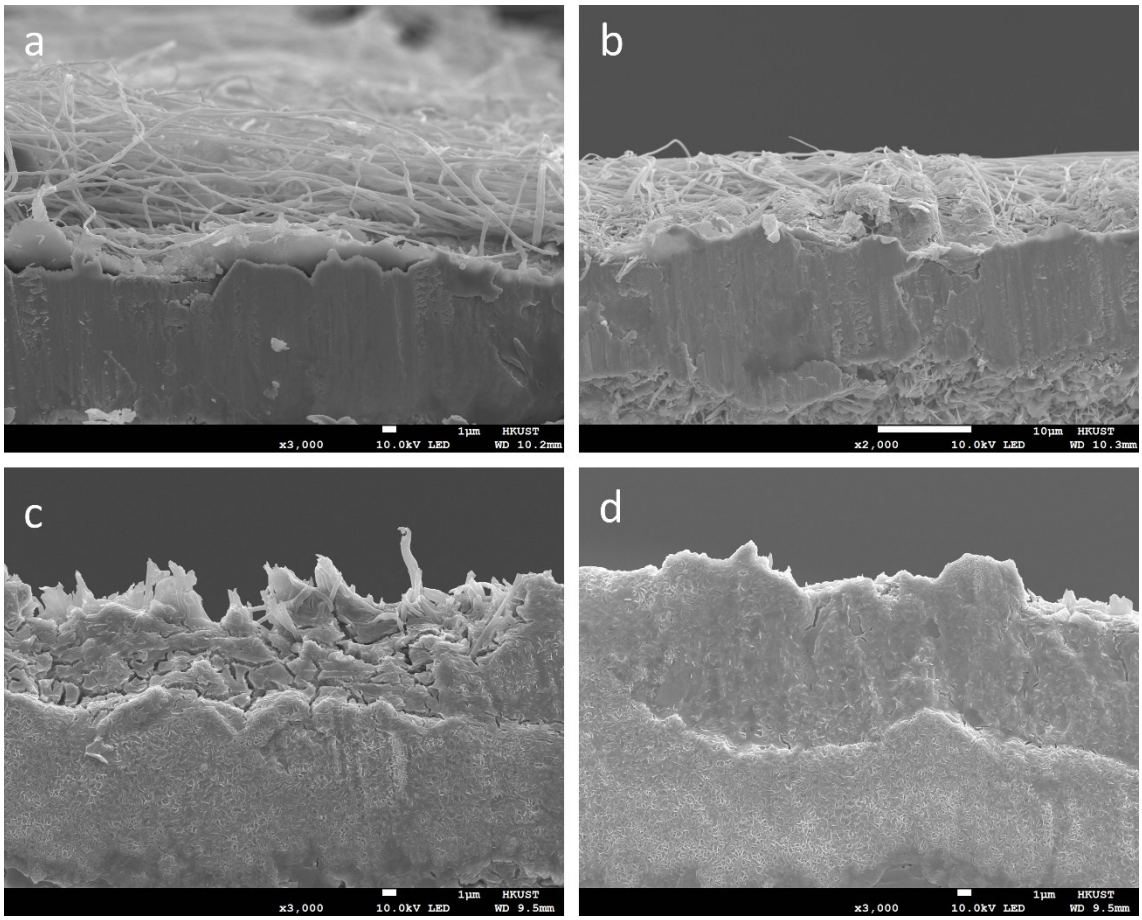

Figure S7. Morphology of Zn deposited on PBI-Cu (cross section) with an areal capacity of (a) 1 mAh cm^{-2}, (b) 2 mAh cm^{-2}, (c) 5 mAh cm^{-2}, (d) 10 mAh cm^{-2}.

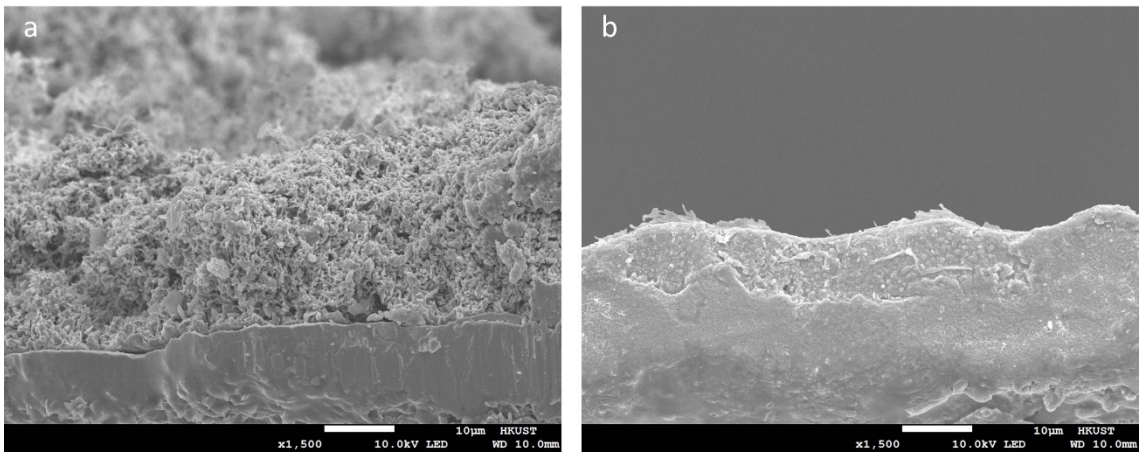

Figure S8. Cross-section image of 10 mAh Zn metal deposited on (a) bare Cu with porous and nonuniform distribution, (b) on PBI Cu with dense and uniform distribution in the PBI framework.

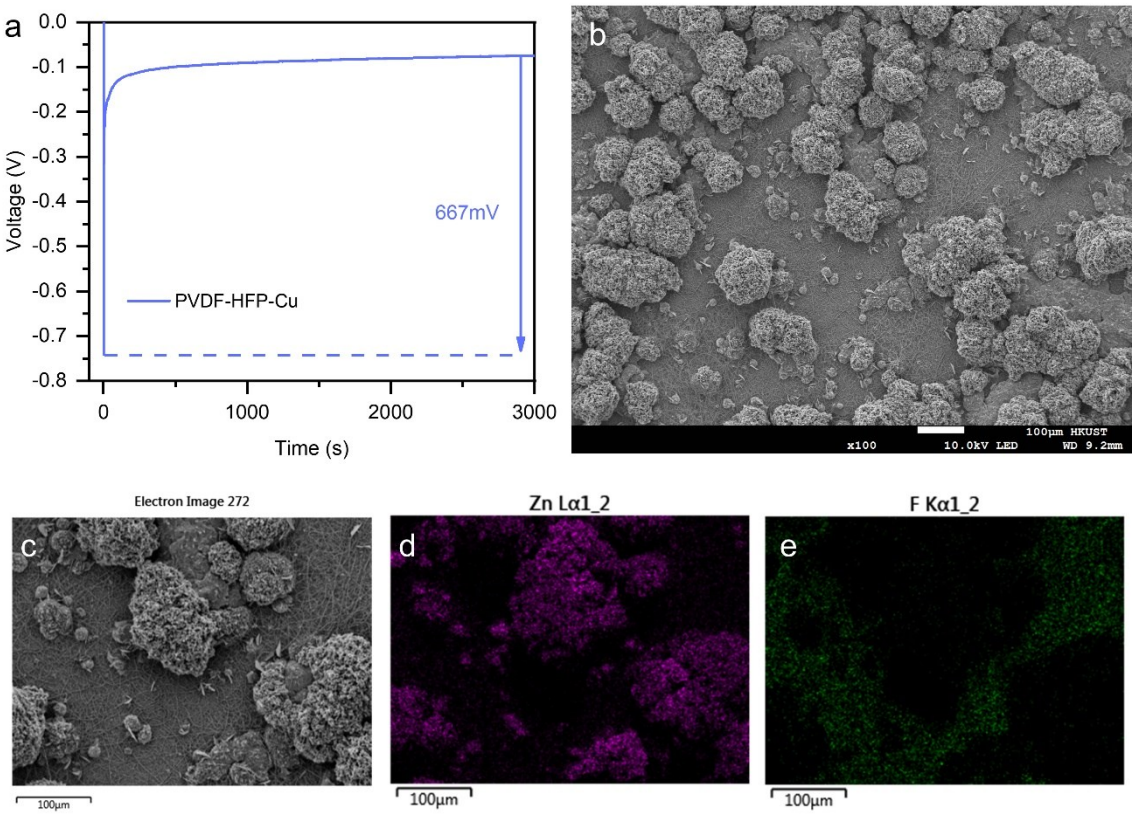

Figure S9. Optical microscope image of 10 mAh Zn metal deposited on PVDF-HFP Cu with different magnification.

Table S1. The fitting resistance results of symmetric cells for PBI Cu and bare Cu by the equivalent circuit at different temperatures.

Symmetric cell	Resistance (Ω)	25 ℃ (Ω)	35 ℃ (Ω)	40 ℃ (Ω)	45 ℃ (Ω)	55 ℃ (Ω)
PBI Cu	R_{ct}	1986.4	1399.6	1149.8	963.8	689.1
	R_s	6.8	7.5	8.1	8.6	9.9
Cu	R_{ct}	457.9	353.5	316.6	283.49	218.2
	R_s	7.1	8.2	8.6	9.3	12.2