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

Ultra-Durable and Flexible Fibrous Mild Quasi-Solid-State Ag-Zn Battery with Na_2SO_4 Electrolyte Additive

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Fig. S1 The photograph of long CNTF current collector.

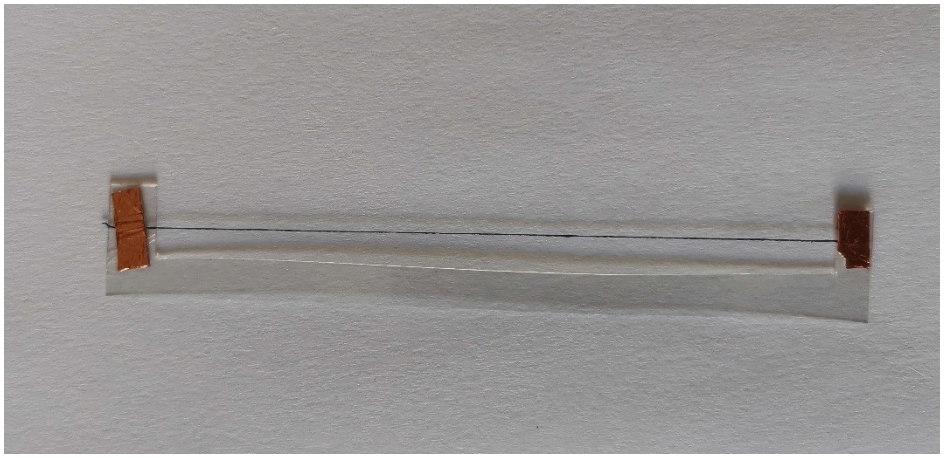

Fig. S2 The photograph of CNTF-NCA-Ag cathode.

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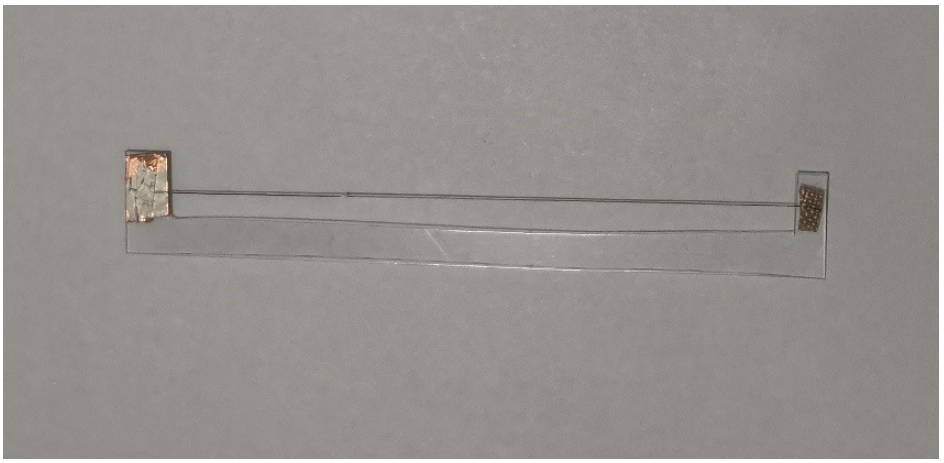

Fig. S3 The photograph of CNTF-Zn anode.

Fig. S4 The photograph of fiber shaped Ag-Zn battery without packaging material.

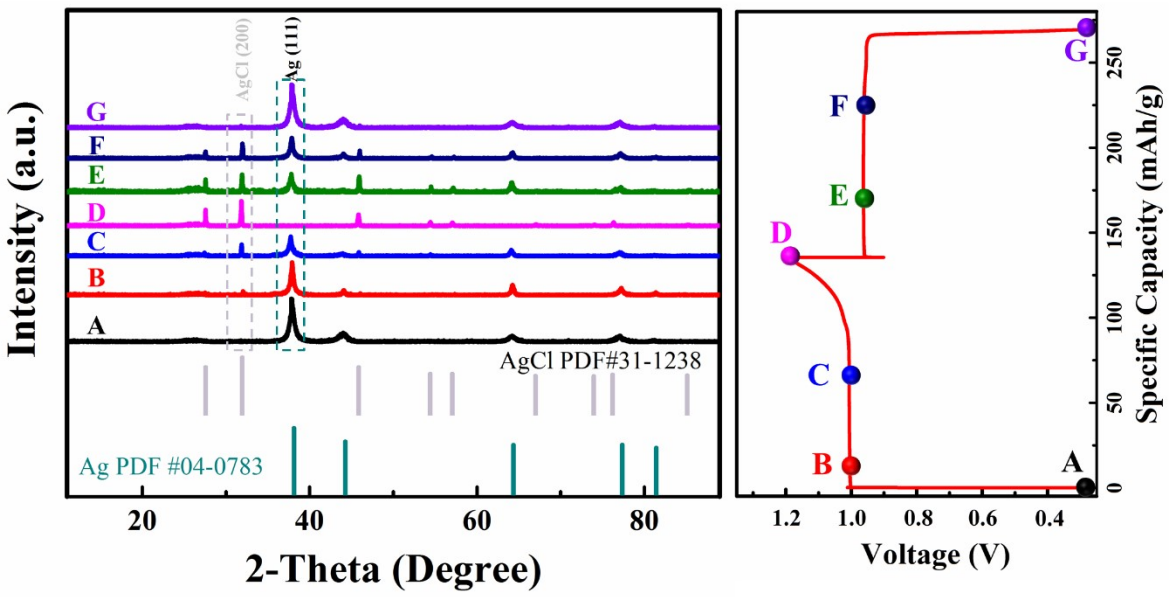

Fig. S5 The ex-situ XRD patterns of Ag cathode in 2 M $ZnCl_2$ + 0.5 M Na_2SO_4 electrolyte at the current density of 0.1 A/g.

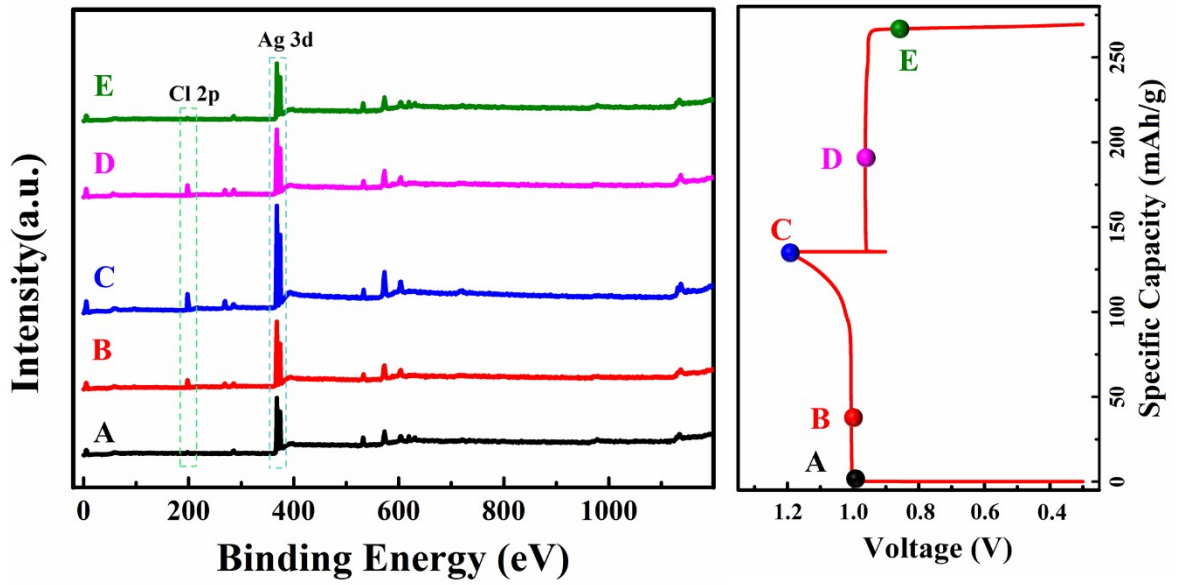

Fig. S6 The ex-situ XPS spectroscopy of Ag cathode in 2 M $ZnCl_2$ + 0.5 M Na_2SO_4 electrolyte at the current density of 0.1 A/g.

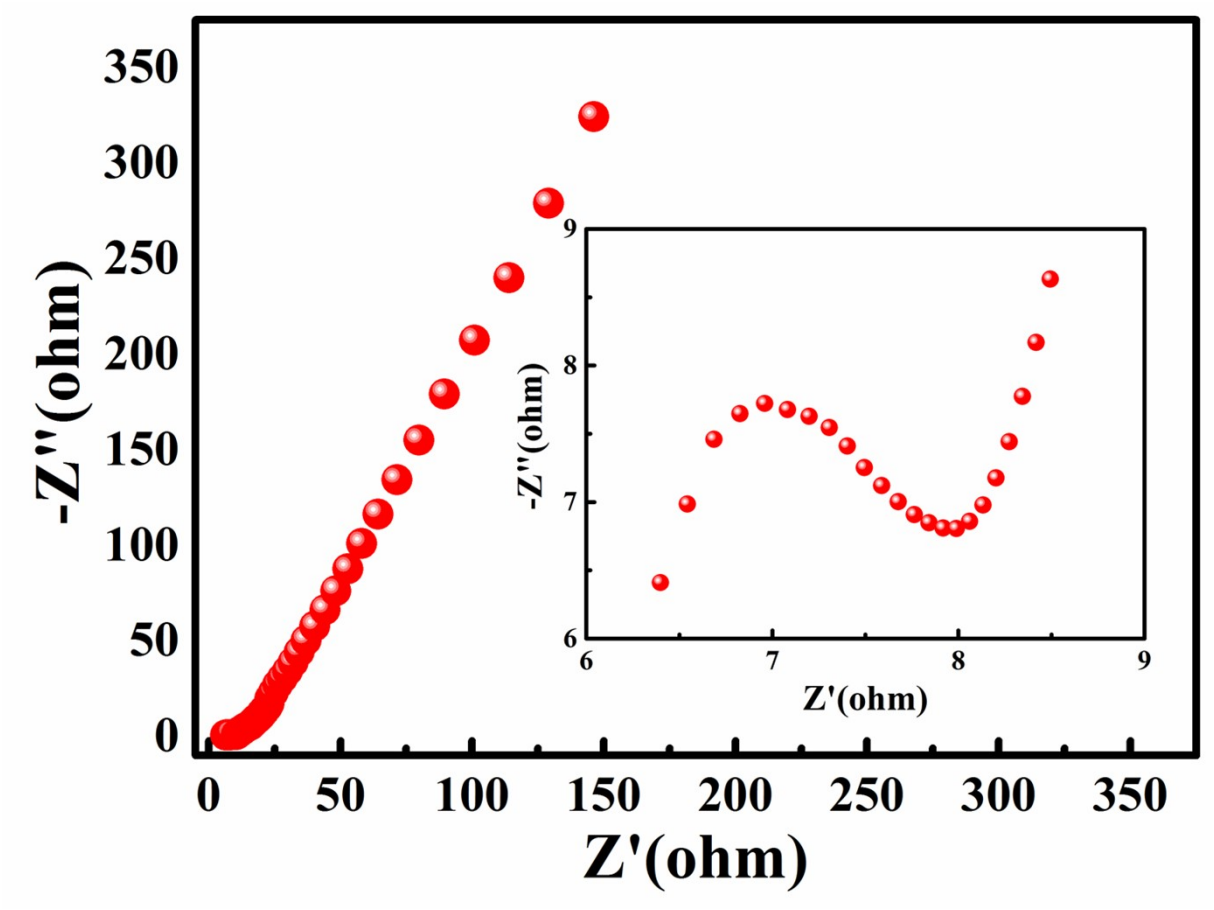

Fig. S7 Nyquist plot of the aqueous mild Ag-Zn batteries at frequencies from 10^{-2} to 10^{5} Hz at open-circuit potential (Inset: enlarged plot in high-frequency range)

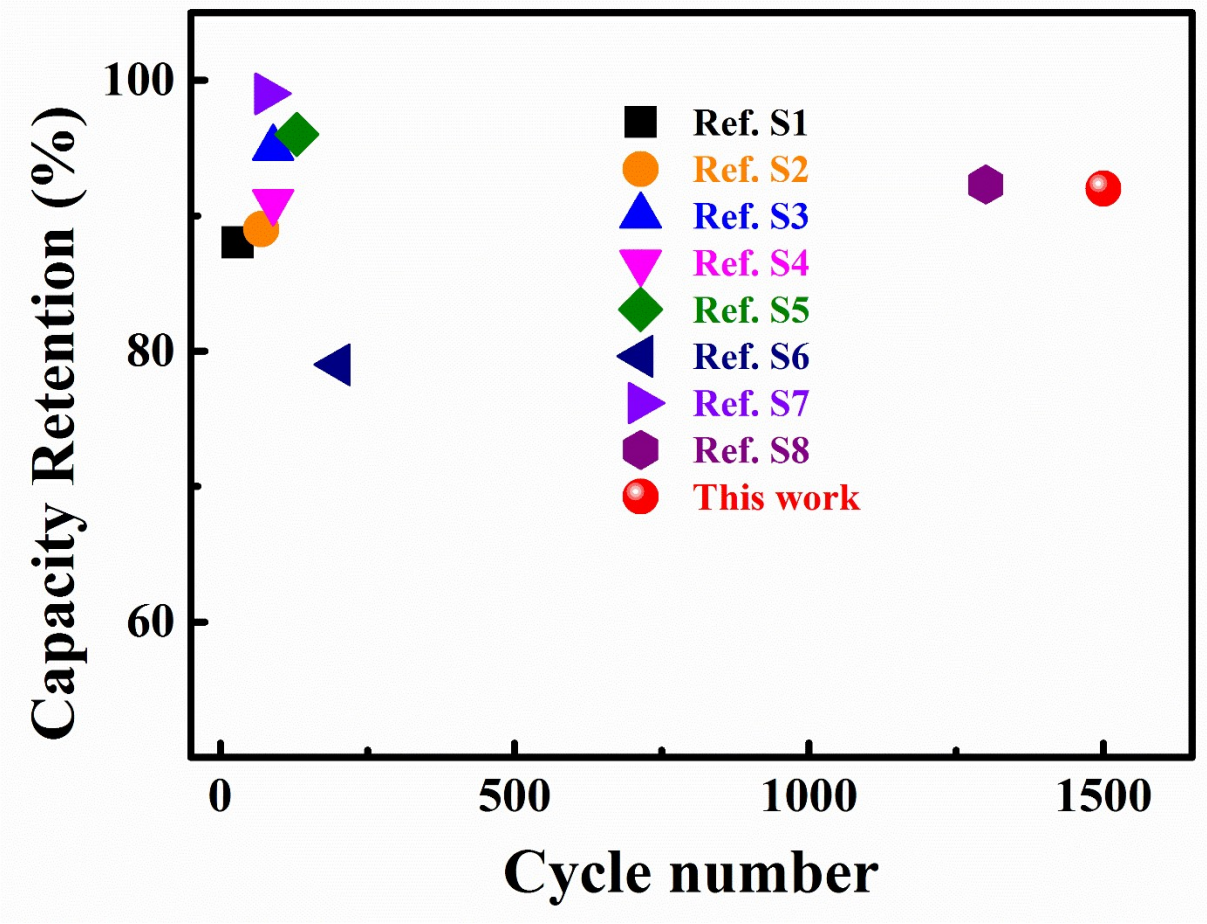

Fig. S8 Cyclic performance of Ag-Zn batteries in recently reported literatures.[1-8]

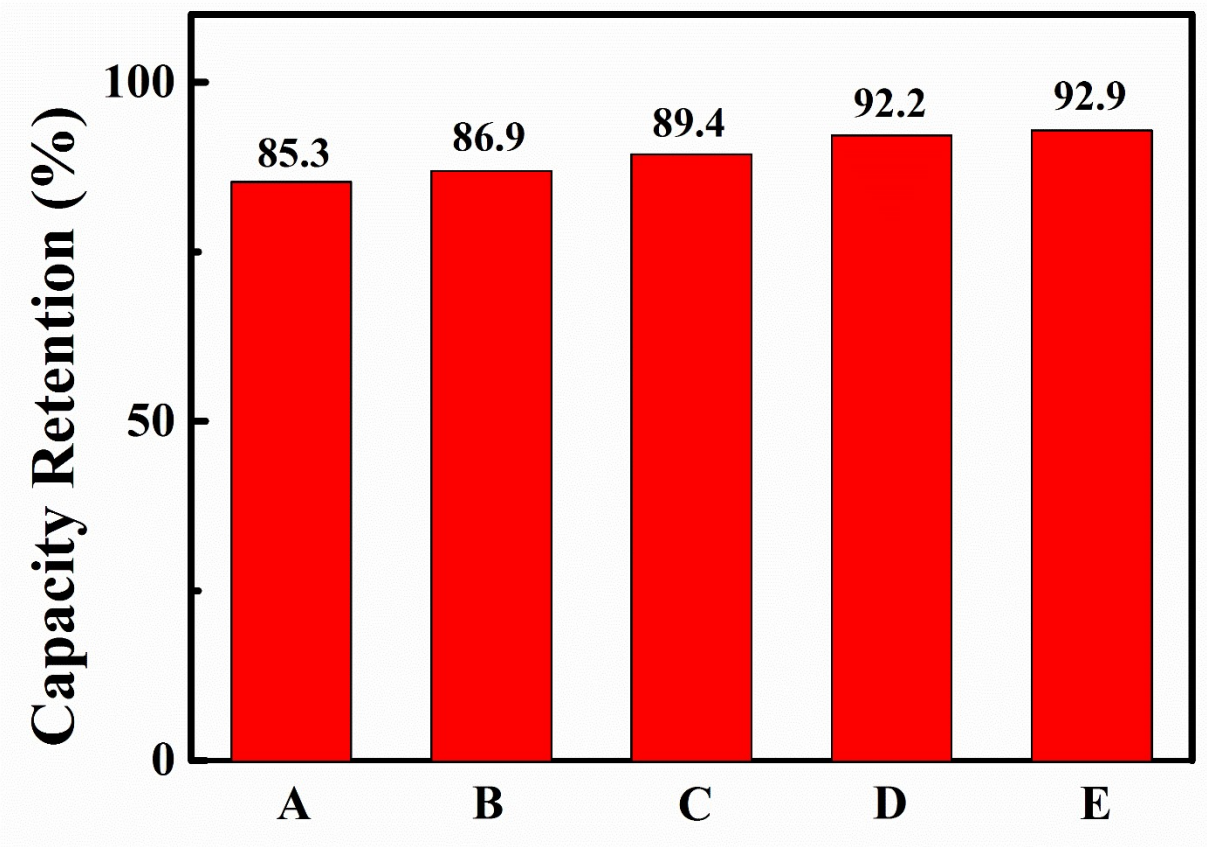

Fig. S9 The Cyclic performance of mild Ag-Zn batteries in different electrolytes: A, 2 M $ZnCl_2$; B, 2 M $ZnCl_2$ + 0.1 M Na_2SO_4; C, 2 M $ZnCl_2$ + 0.3 M Na_2SO_4; D, 2 M $ZnCl_2$ + 0.5 M Na_2SO_4; E, 2 M $ZnCl_2$ + 0.9 M Na_2SO_4.

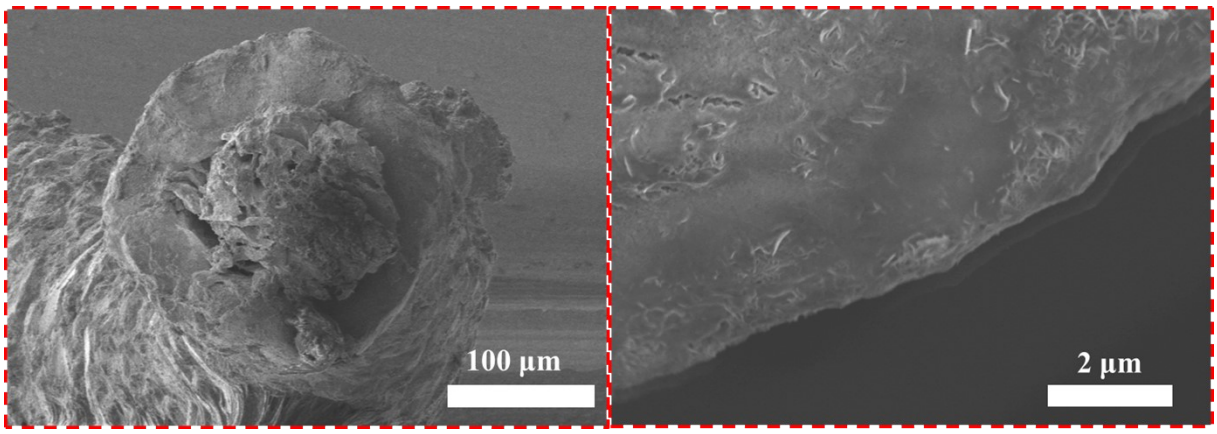

Fig. S10 The cross-sectional microscopic images of CNTF-Zn anode in2 M $ZnCl_2$ + 0.5 M Na_2SO_4 after cyclic measurement.

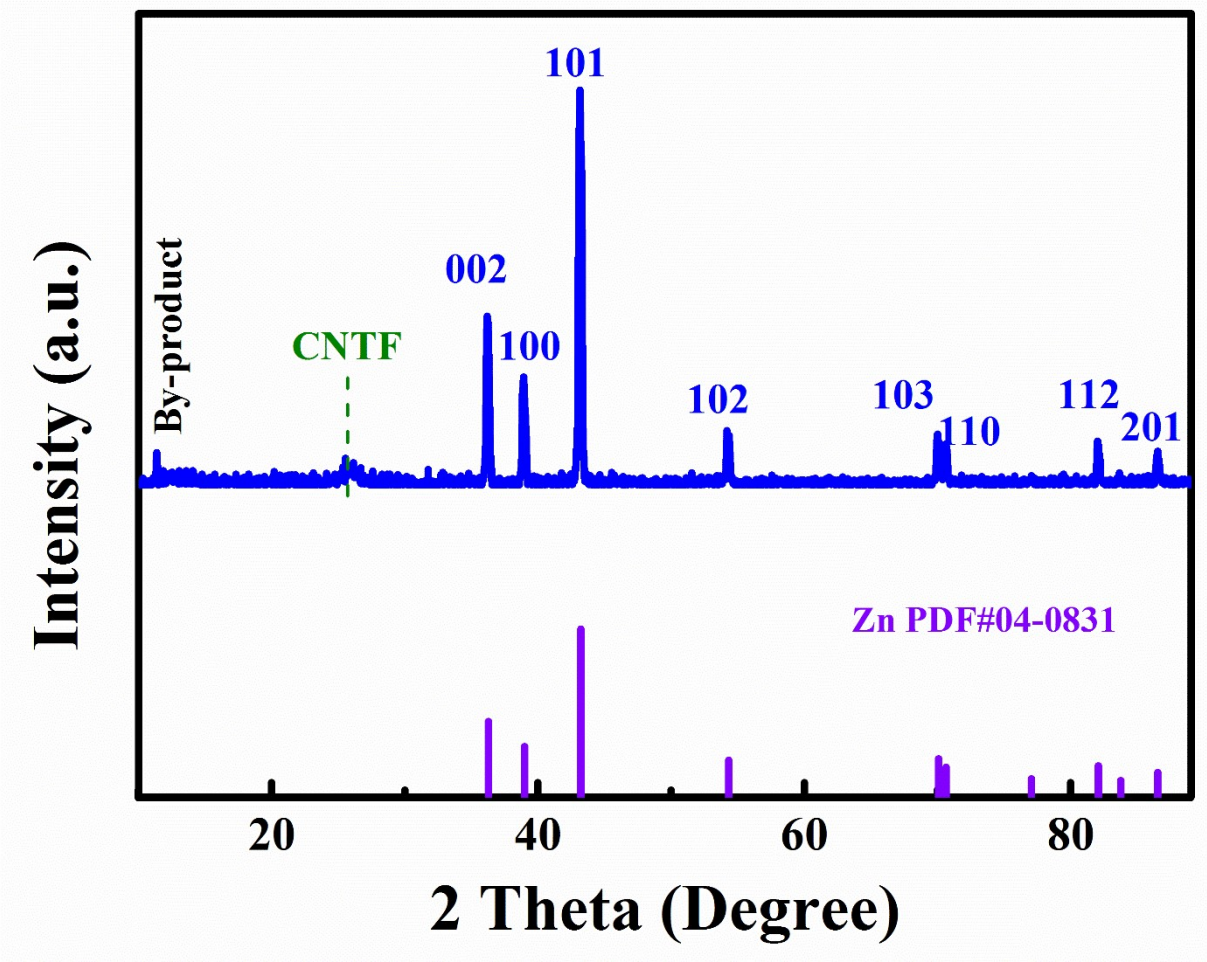

Fig. S11 The XRD of Zn anode after cyclic test, where the by-product of $Zn_5(OH)_8Cl_2 \cdot H_2O$ (PDF#07-0155) certainly exist.

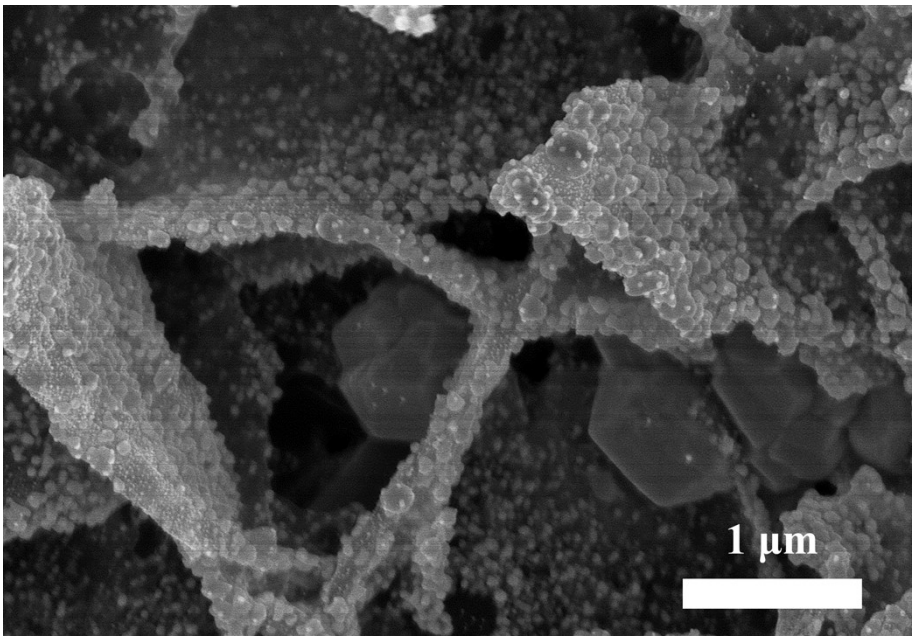

Fig. S12 The SEM image of CNTF-NCA-Ag cathode after cyclic measurement.

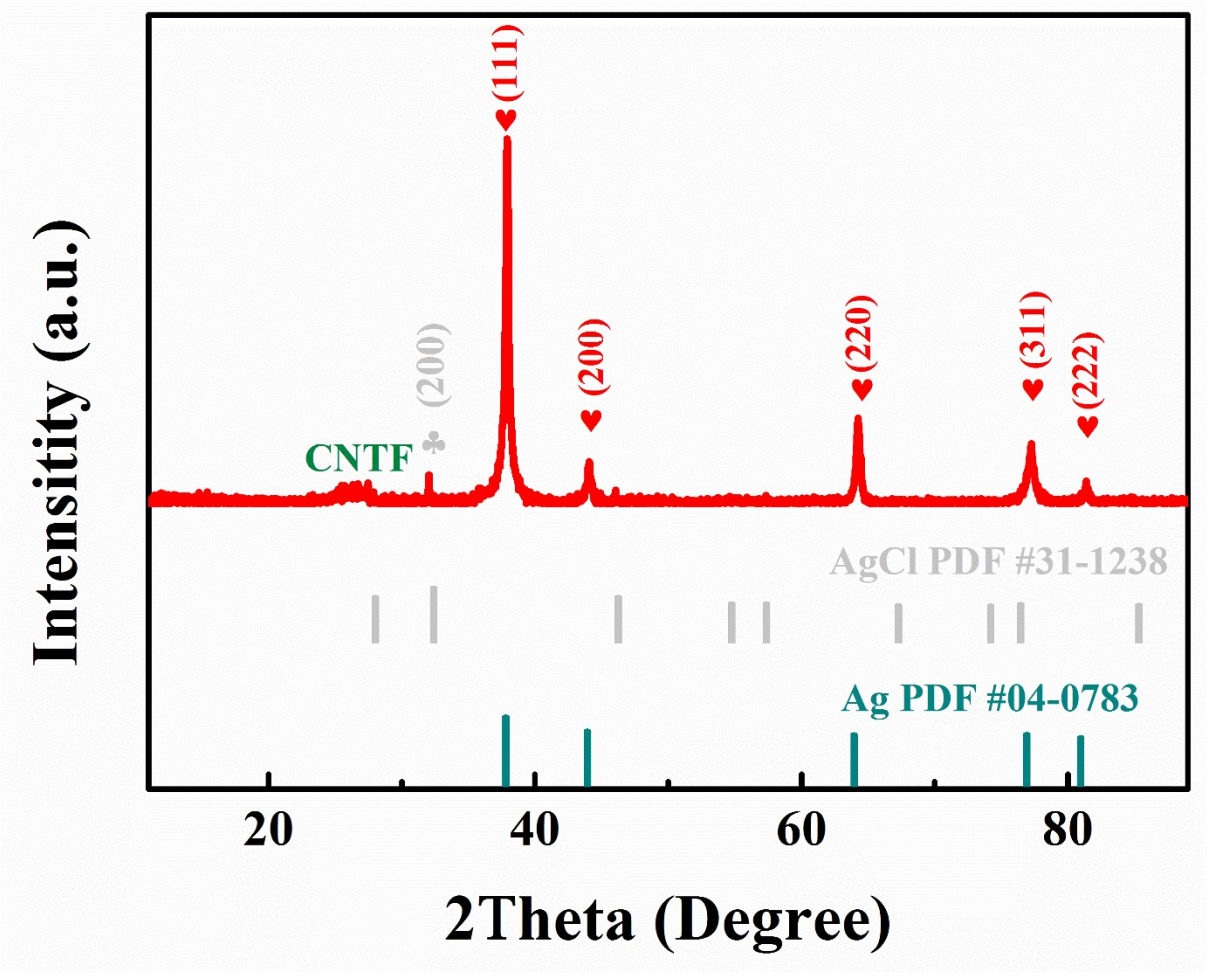

Fig. S13 The XRD of cathode after cyclic test.

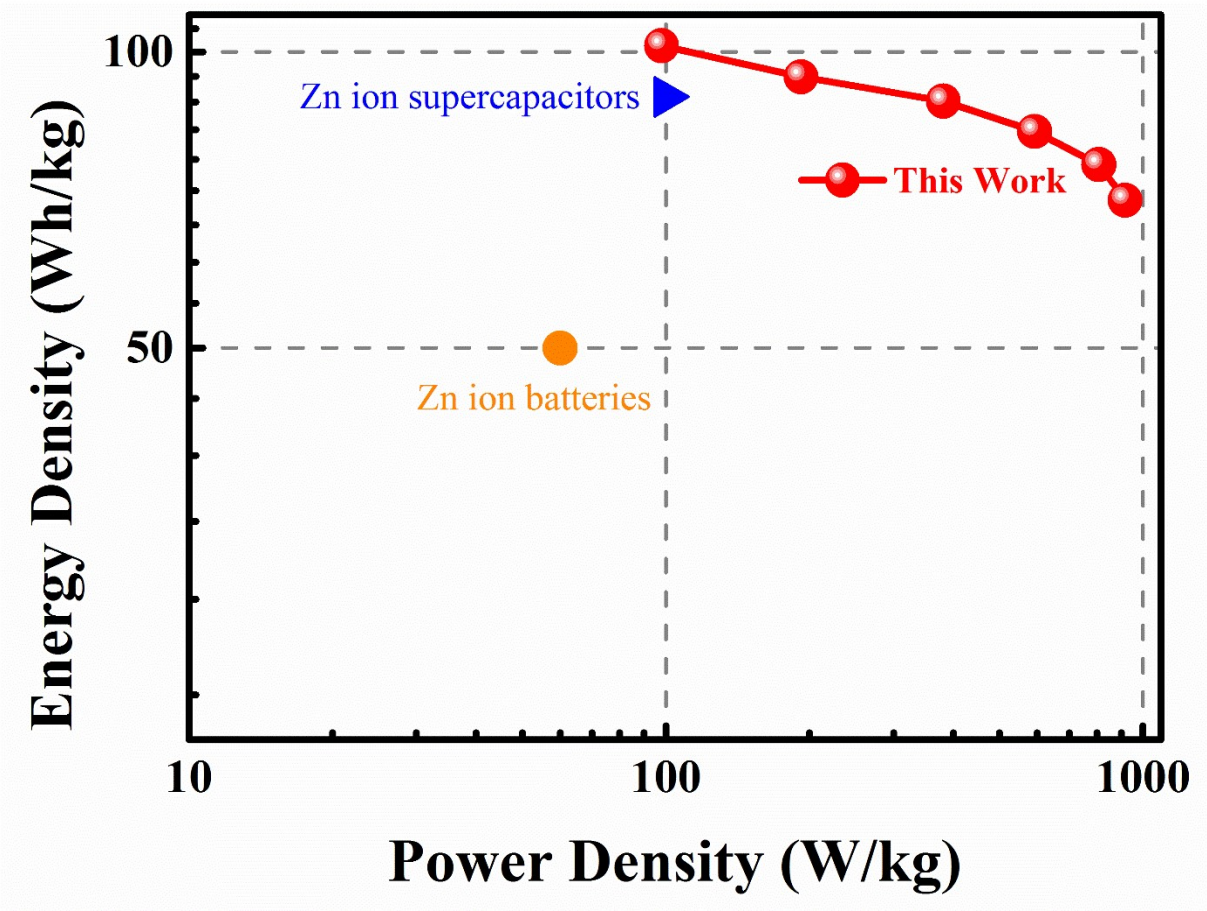

Fig. S14 The Ragone plot of energy densities versus power densities of the flexible quasi-solid-state mild Ag-Zn and previously published aqueous batteries[9] and supercapacitors[10].

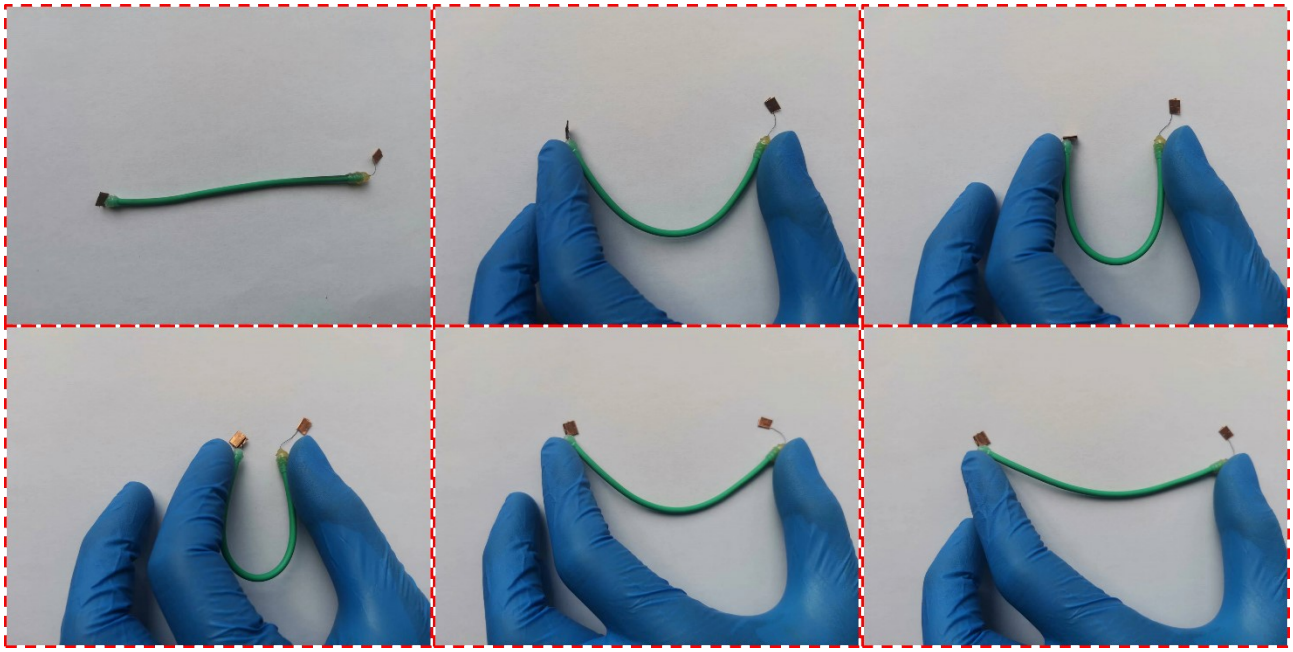

Fig. S15 the photographs of as-made quasi-solid-state device at different bending angle

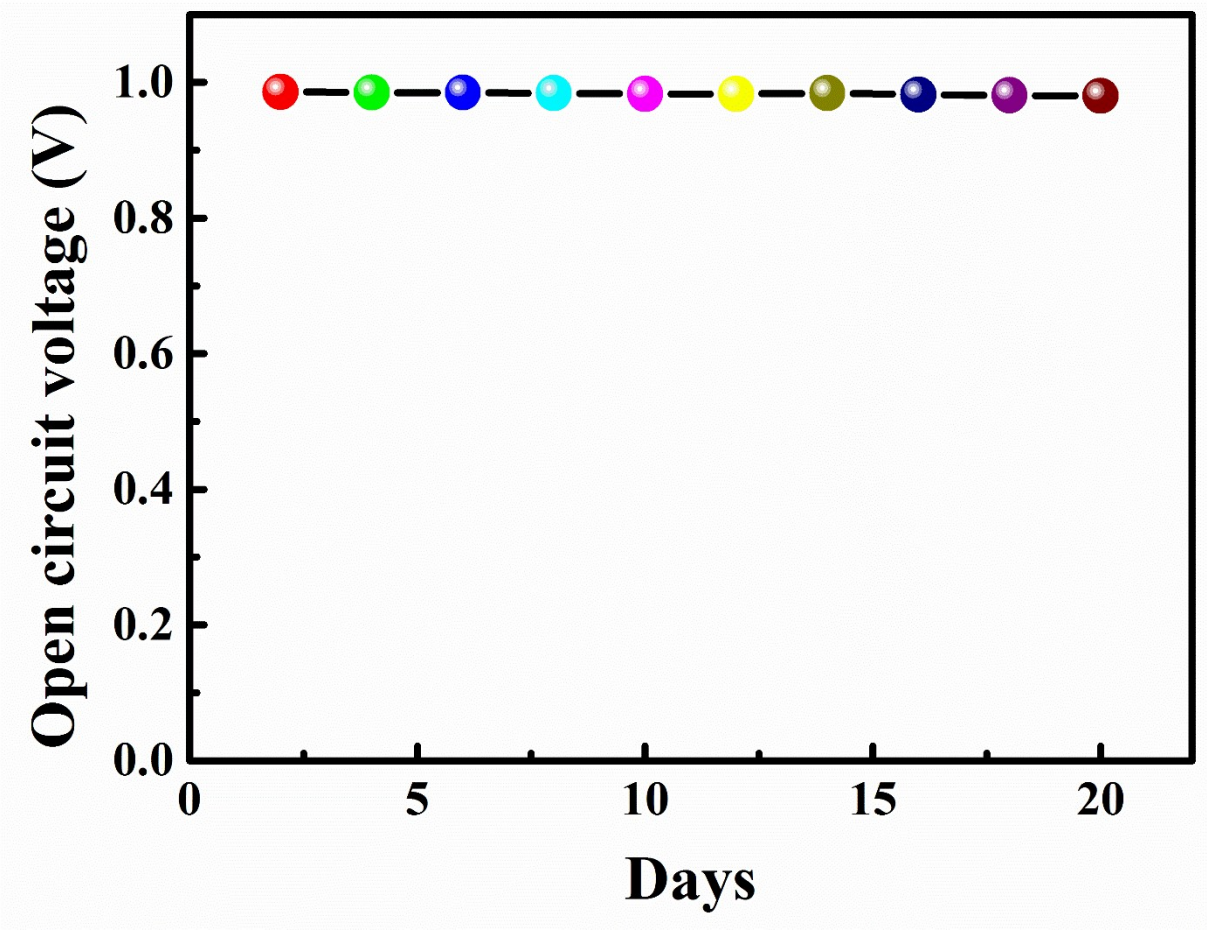

Fig. S16 The self-discharge performance of the flexible quasi-solid-state mild Ag-Zn battery.

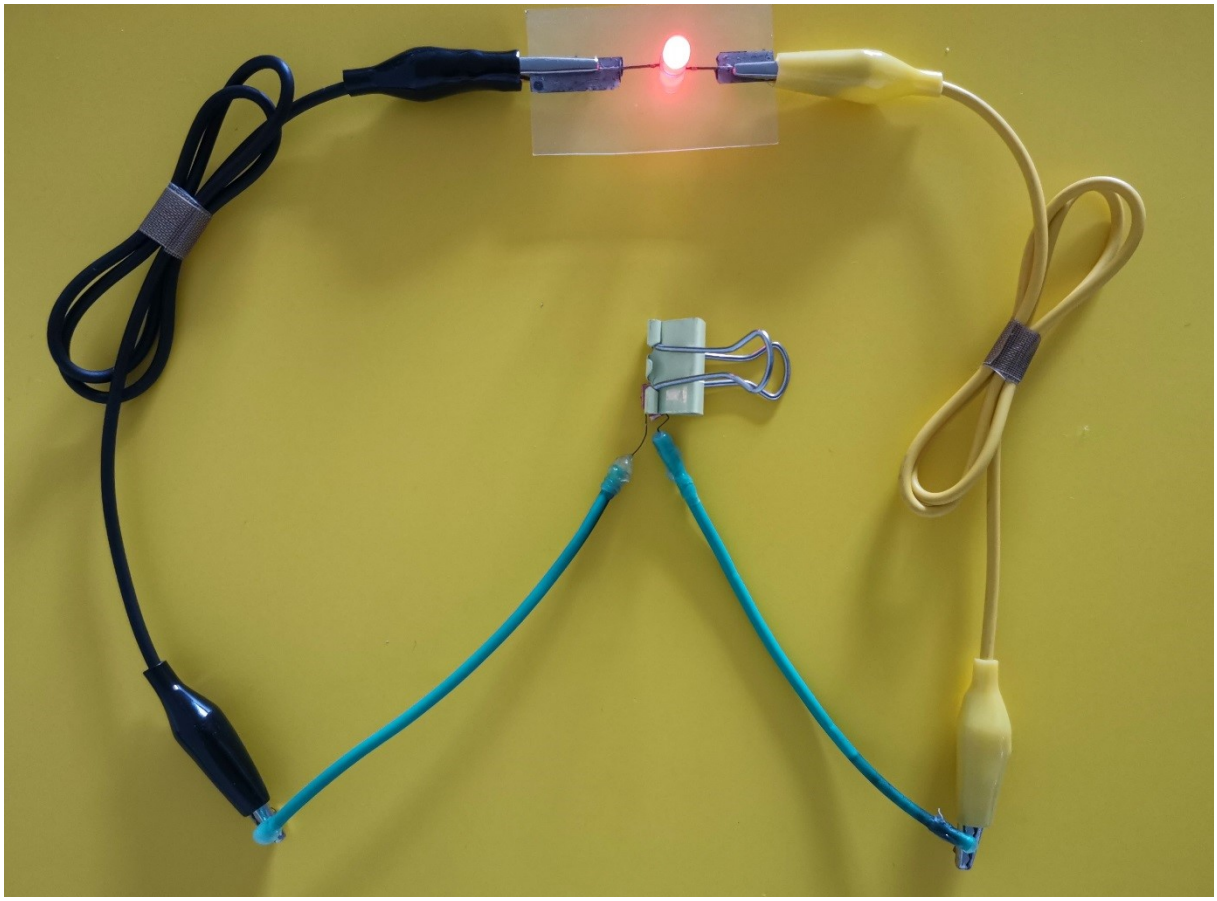

Fig. S17 A red LED bulb lighted by two devices connected in series.

References

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