

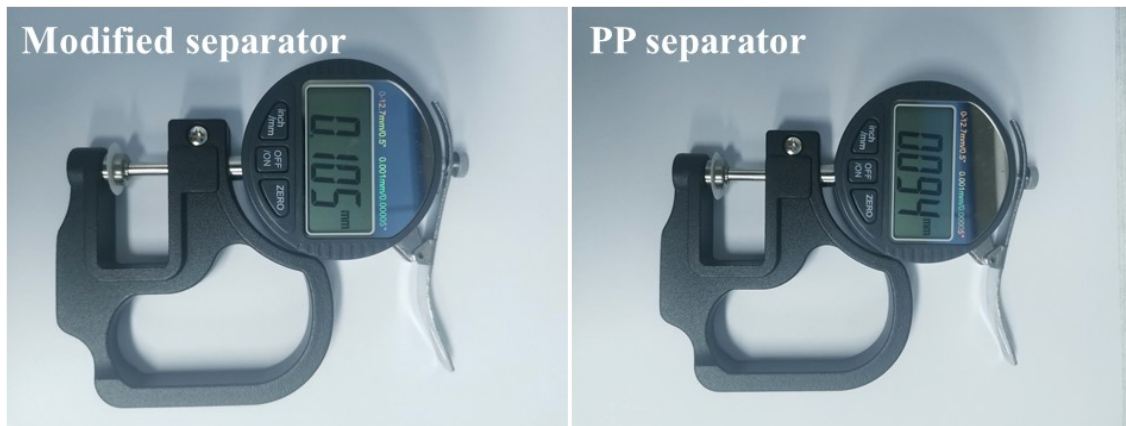
## **Adjusting Zinc Deposition Behaviors by A Modified Separator to Acquire Zinc Anodes for Aqueous Rechargeable Zinc-Ion Batteries**

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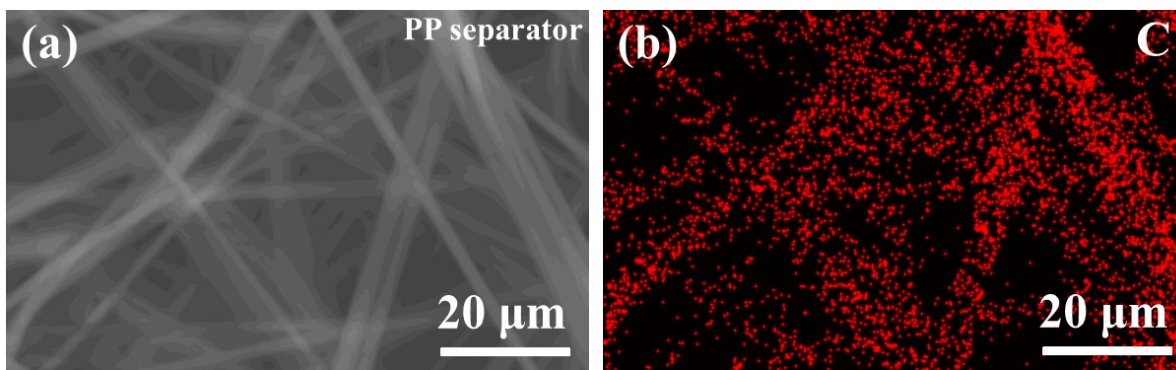
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**Fig. S1** The optical photograph of different separators.



**Fig. S2** The SEM image of PP separator and the element mapping of related C.



**Fig. S3** The contact angle of different separator.

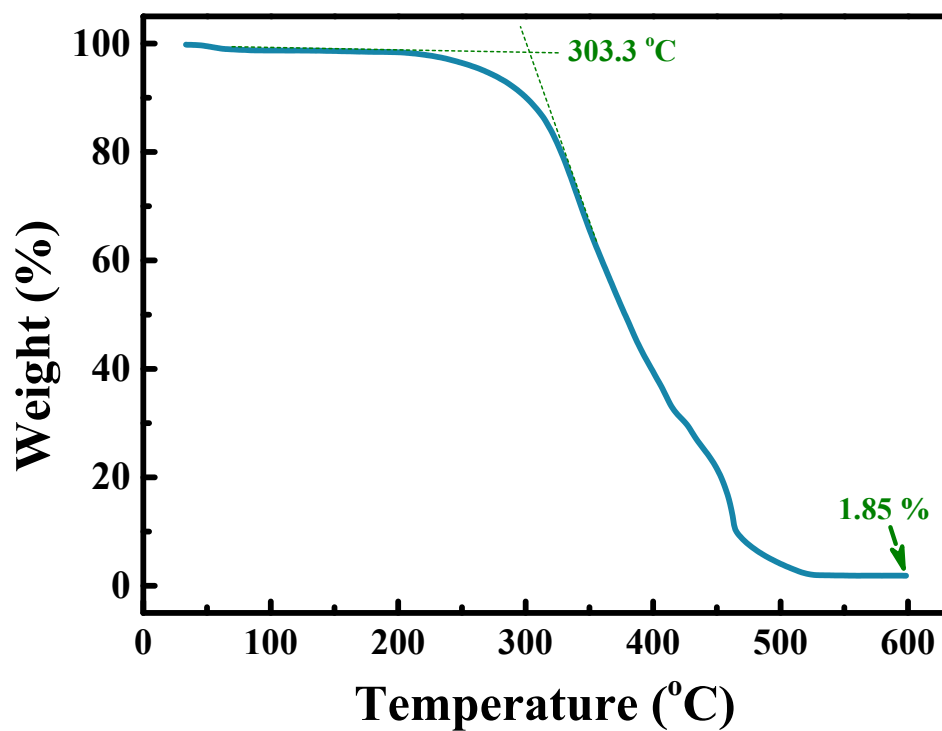


Fig. S4 TG profile of the modified separator.

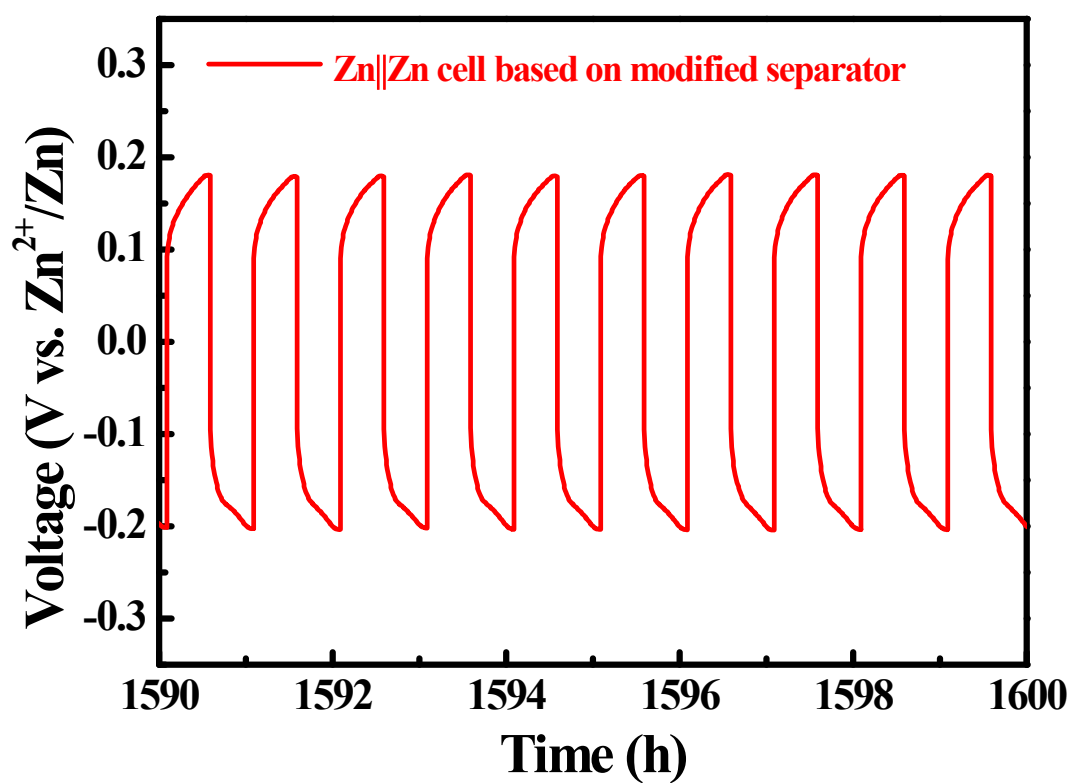
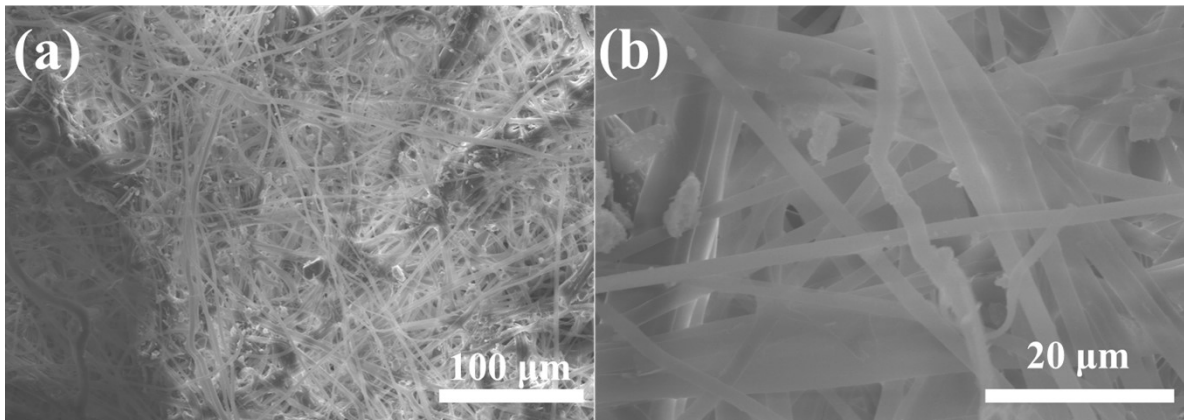


Fig. S5 The enlarged voltage profiles of symmetrical batteries at 1590–1600 h.



**Fig. S6** The SEM image (a) low and (b) high magnification of PP separator after cycling.

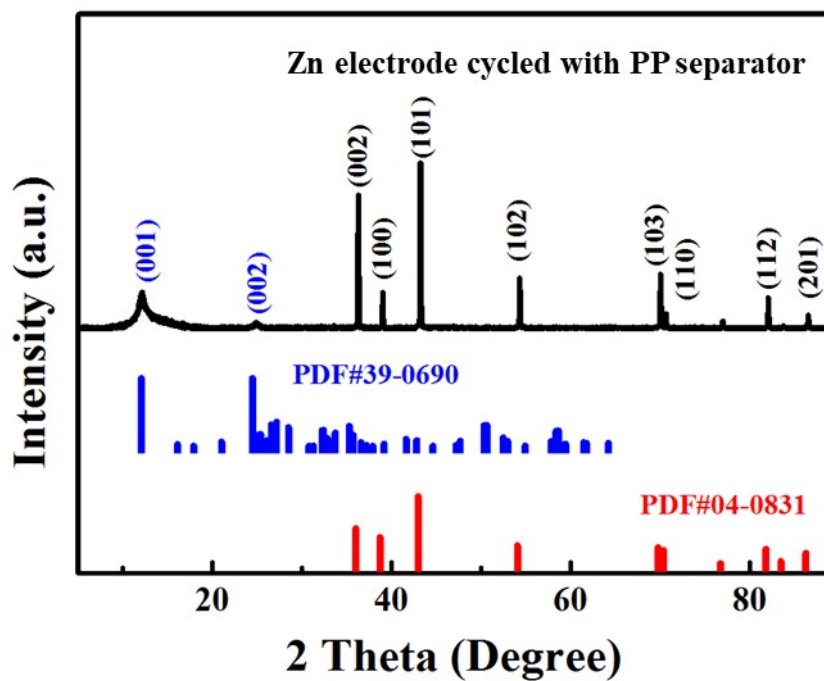


Fig. S7 The XRD patterns of Zn electrode cycled with PP separator.



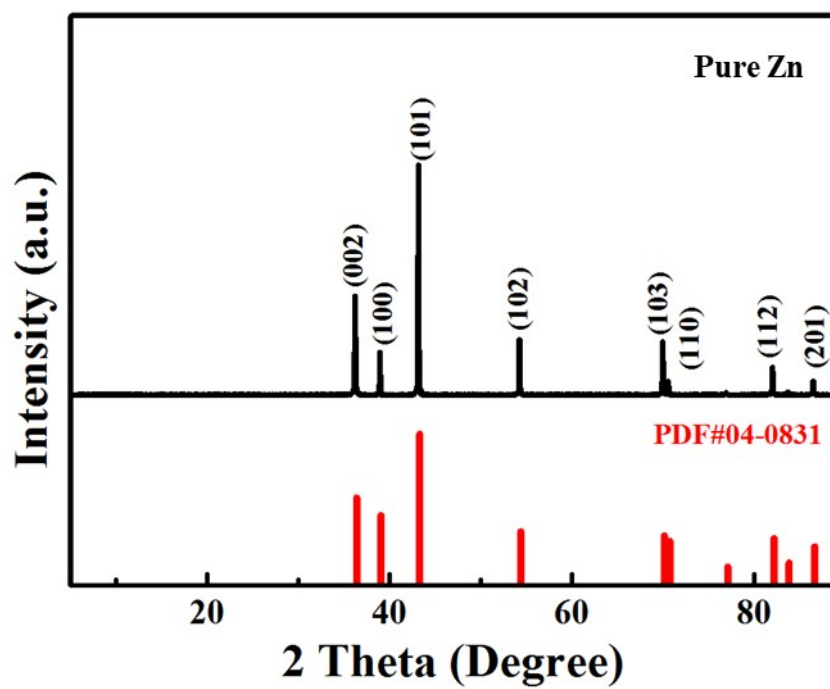


Fig. S8 The XRD patterns of pure Zn foil.

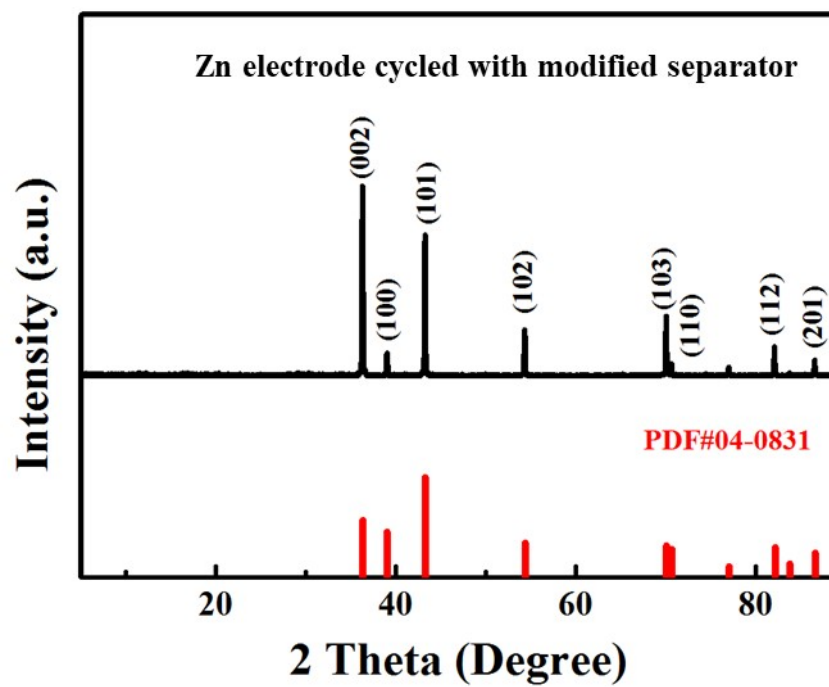
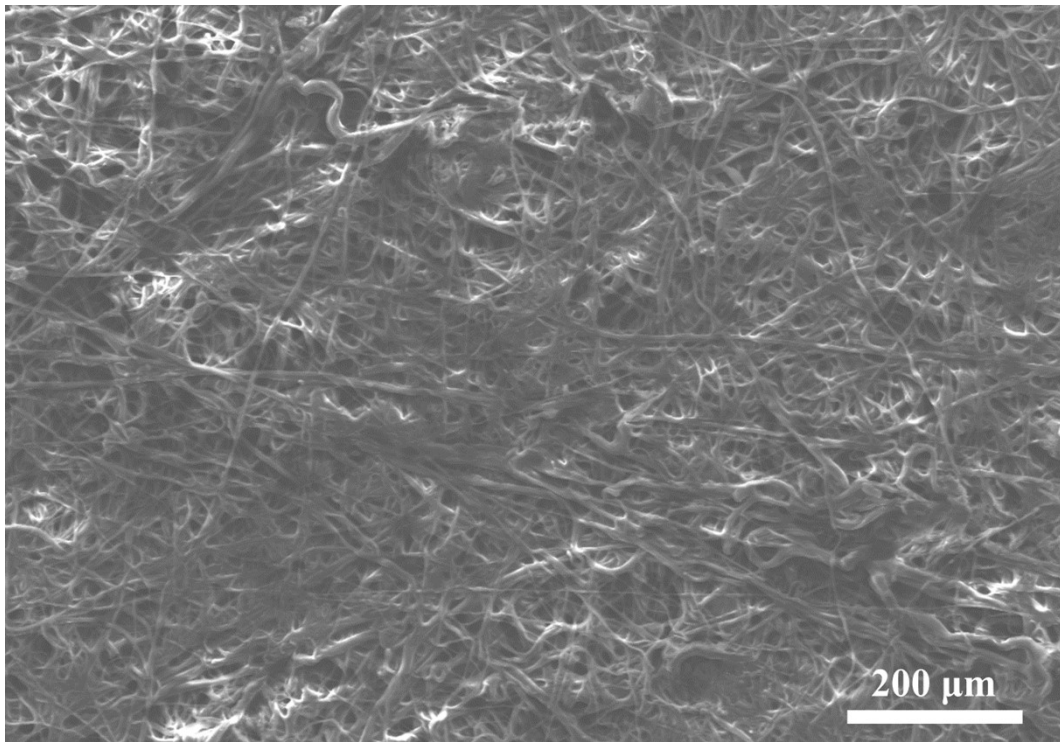
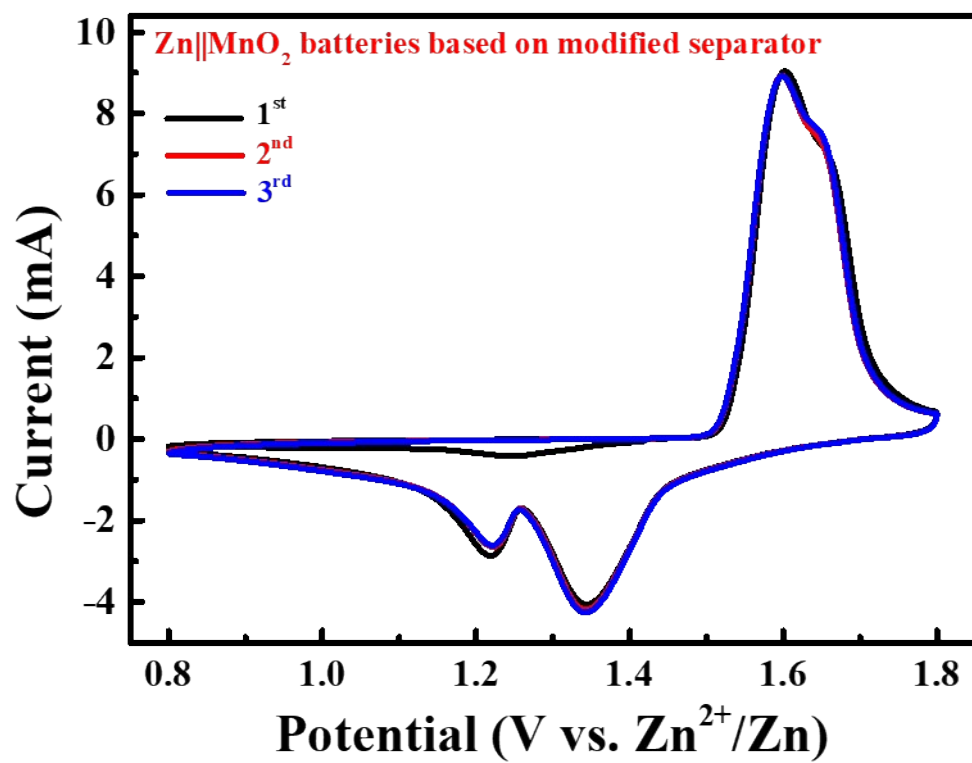


Fig. S9 The XRD patterns of Zn electrode cycled with modified separator.



**Fig. S10** The SEM image of modified separator after cycling test



**Fig. S11** Initial three cycles of the cyclic voltammetry (CV) profiles of Zn||MnO<sub>2</sub> batteries based on modified separator.

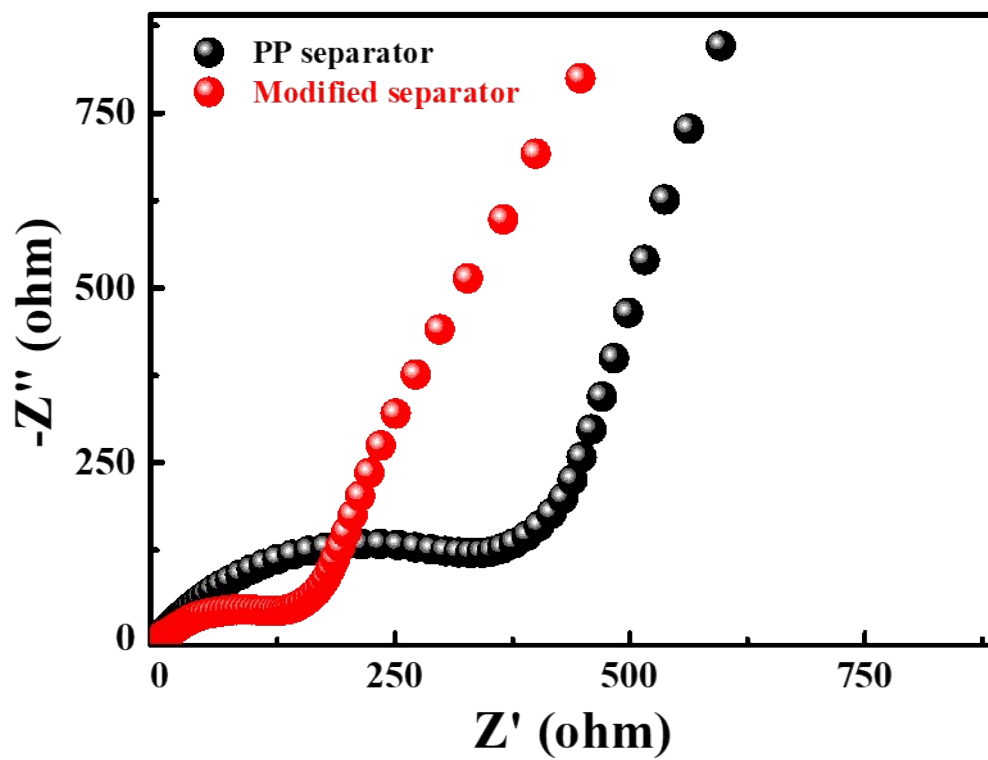
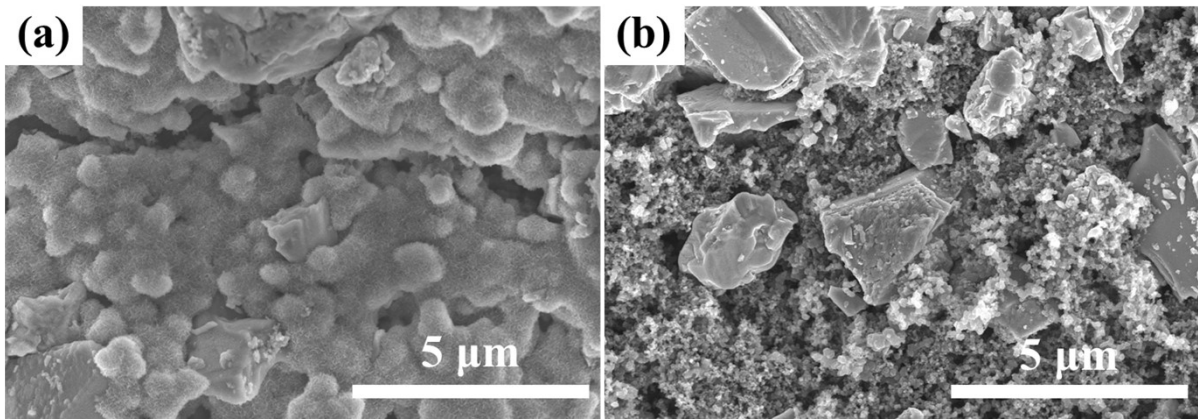
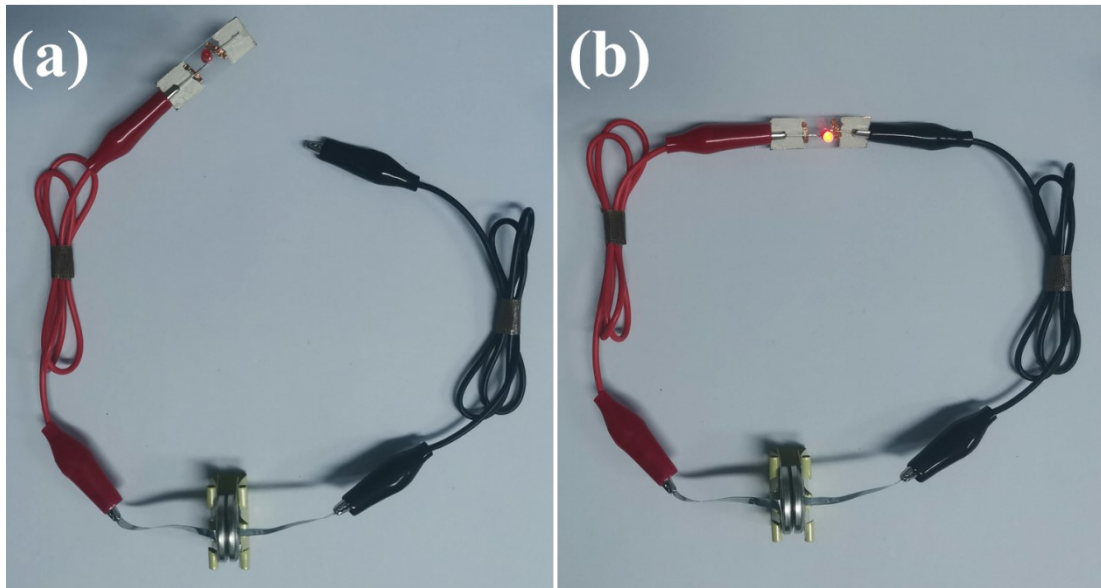


Fig. S12 EIS plots of Zn||MnO<sub>2</sub> batteries based on different separators.



**Fig. S13** The SEM image of (a) cycled MnO<sub>2</sub> cathode and (b) original MnO<sub>2</sub> cathode.



**Fig. S14** The photographs of light emitting diode (LED) power by two Zn||MnO<sub>2</sub> batteries based on modified separator (a) unconnected; (b) connected