

## Supporting Information

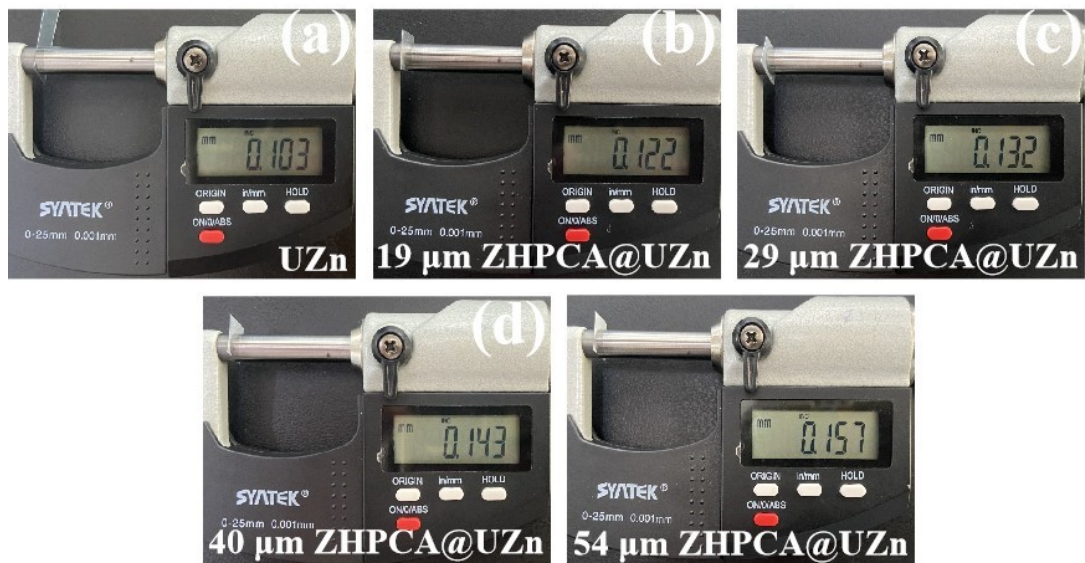
# Zincophilic MOF with N-functional groups for interfacial modification of stable aqueous zinc metal anodes

Na Sun,<sup>a</sup> Han Yu,<sup>a</sup> Xue Zhou,<sup>a</sup> Xiuwen Si,<sup>a</sup> Pengfei Wang,<sup>b</sup> Zhe Gong,<sup>\*a</sup> Yaguang Sun,<sup>\*a</sup> and Mingdong Zhou<sup>\*a</sup>

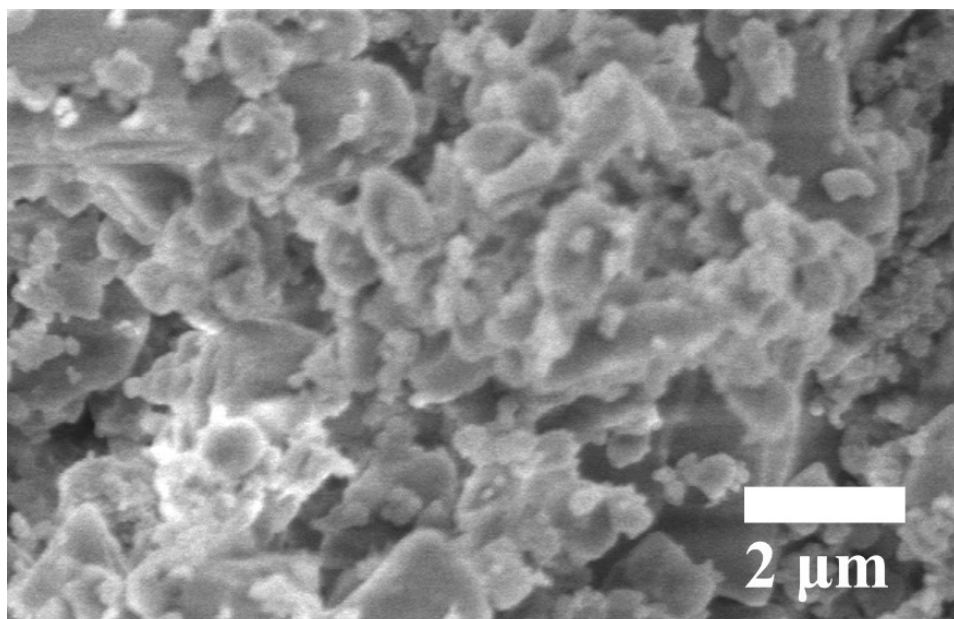
<sup>a</sup> *Shenyang University of Chemical Technology, Shenyang 110142, P. R. China*

<sup>b</sup> *Key Laboratory of Polymer and Catalyst Synthesis Technology of Liaoning Province, School of Environmental and Chemical Engineering, Shenyang University of Technology, Shenyang, 110870, China*

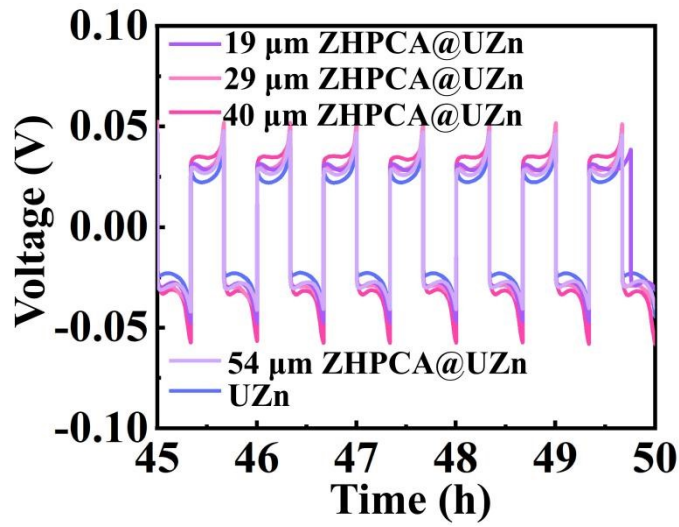
\*Corresponding Author: zgong@syuct.edu.cn (Zhe Gong); sunyaguang@syuct.edu.cn (Yaguang Sun); mingdong.zhou@syuct.edu.cn (Mingdong Zhou)



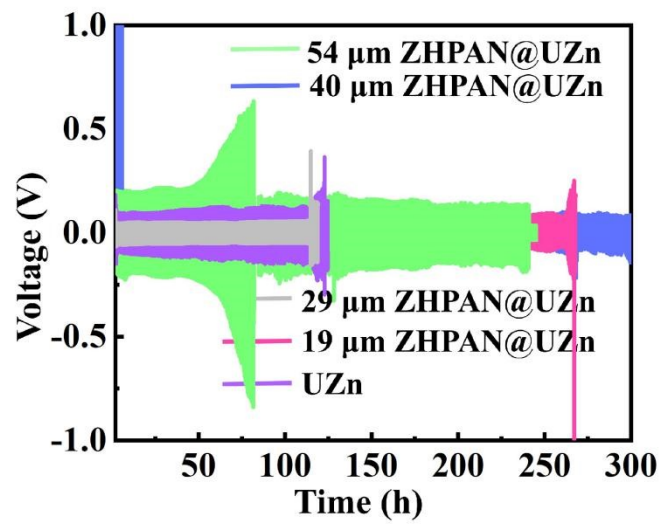
**Fig. S1.** Thickness measurement of different electrodes: (a) UZn, ZHPCA@UZn anodes prepared by scrapers of (b) 75 μm, (c) 100 μm, (d) 150 μm and (e) 200 μm. (The thickness of the modified layer is the total thickness of the electrode minus the thickness of UZn.)



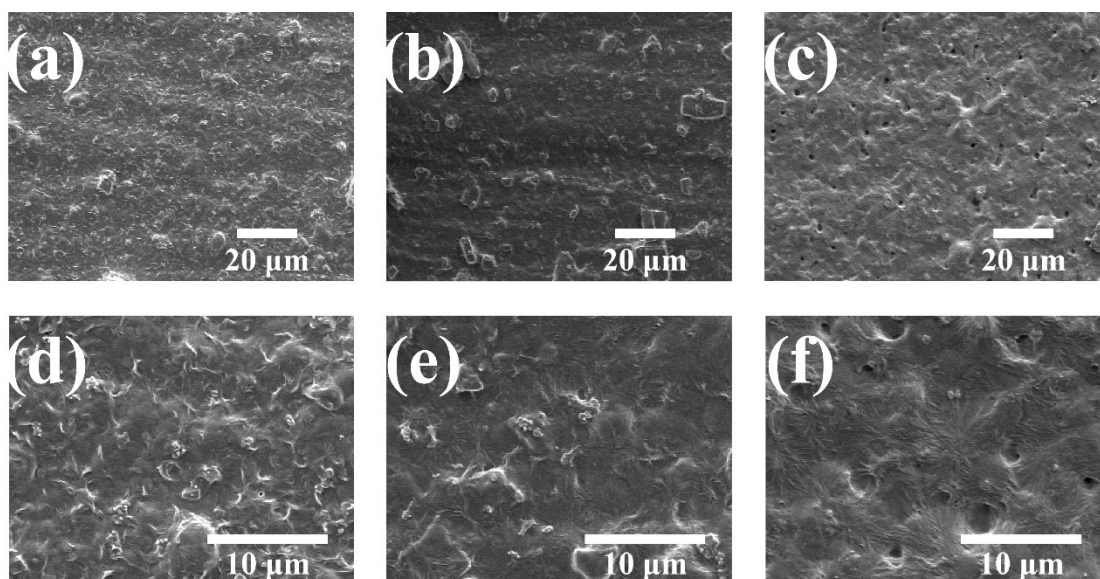
**Fig. S2.** SEM image of ZHPCA.



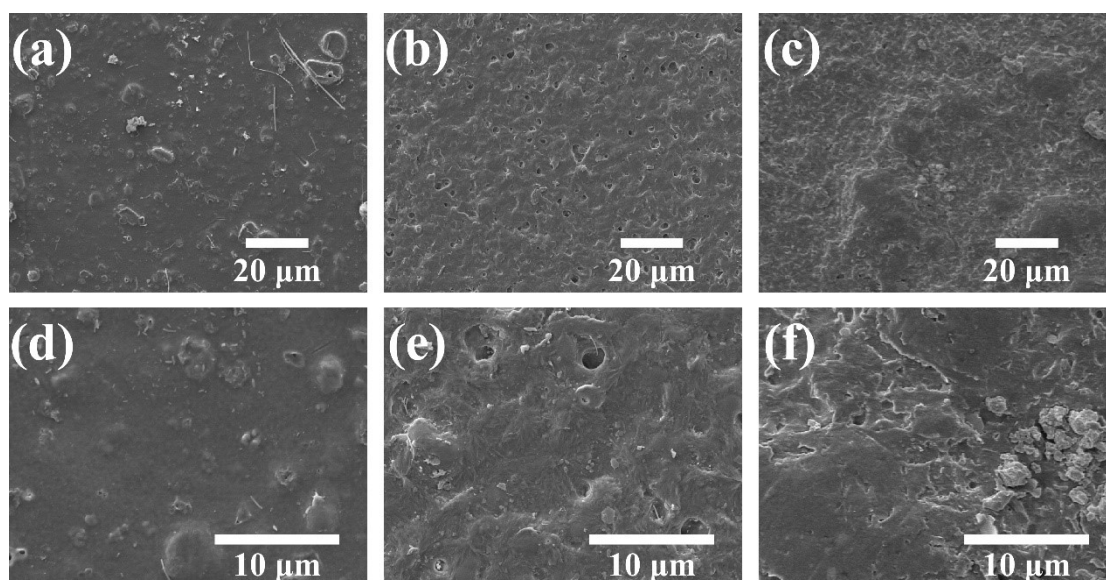
**Fig. S3.** Voltage-time curves of symmetric cells at  $1 \text{ mAh cm}^{-2}$  and  $3 \text{ mA cm}^{-2}$  (45-50 h).



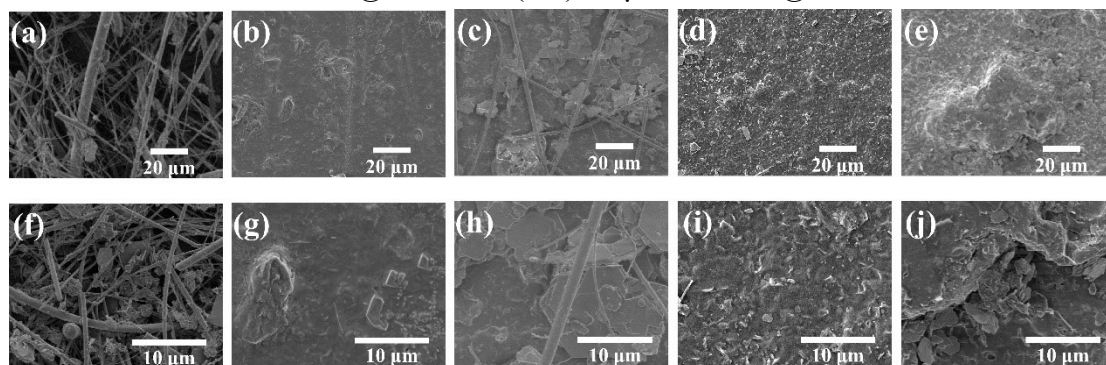
**Fig. S4.** The voltage-time curves of different symmetric cells at  $5 \text{ mA cm}^{-2}$  and  $1 \text{ mAh cm}^{-2}$ .



**Fig. S5.** SEM images of (a, d) 19  $\mu\text{m}$  ZHPCA@UZn and (b, e) 29  $\mu\text{m}$  ZHPCA@UZn and (c, f) 54  $\mu\text{m}$  ZHPCA@UZn before cycling.



**Fig. S6.** SEM images of the surface after 20 cycles at a current density of  $3 \text{ mA cm}^{-2}$  and an areal capacity of  $1 \text{ mAh cm}^{-2}$  for (a, d) 19  $\mu\text{m}$  ZHPCA@UZn, (b, e) 29  $\mu\text{m}$  ZHPCA@UZn, and (c, f) 54  $\mu\text{m}$  ZHPCA@UZn.



**Fig. S7.** SEM images of the surface after 90 cycles at a current density of  $3 \text{ mA cm}^{-2}$

and an areal capacity of 1 mAh cm<sup>-2</sup> for (a, f) UZn and (b, g) 19 μm ZHPCA@UZn and (c, h) 29 μm ZHPCA@UZn and (d, i) 40 μm ZHPCA@UZn and (e, j) 54 μm ZHPCA@UZn.

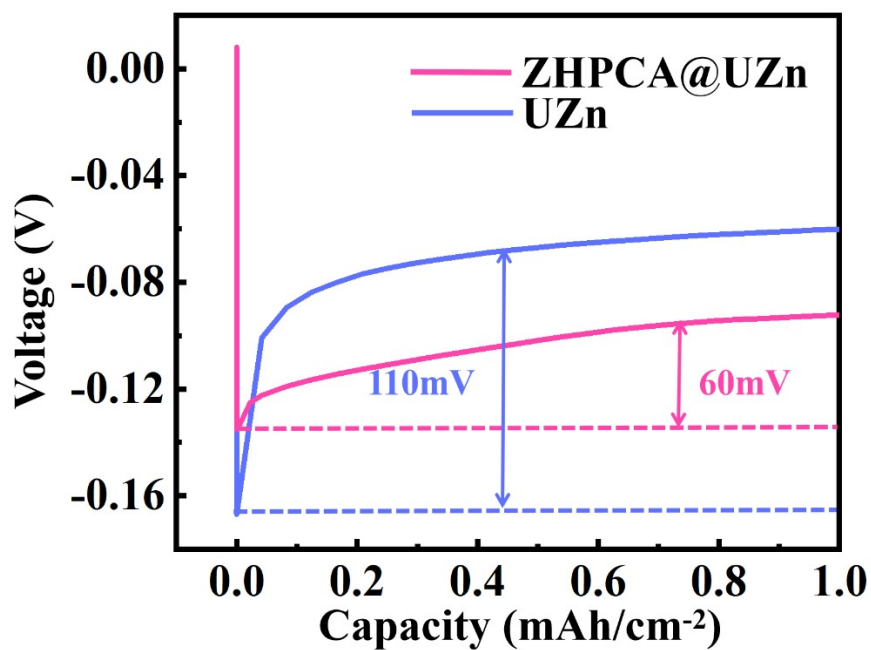


Fig. S8. Nucleation overpotentials of zinc deposition at 5 mA cm<sup>-2</sup> of ZHPCA@UZn and UZn.

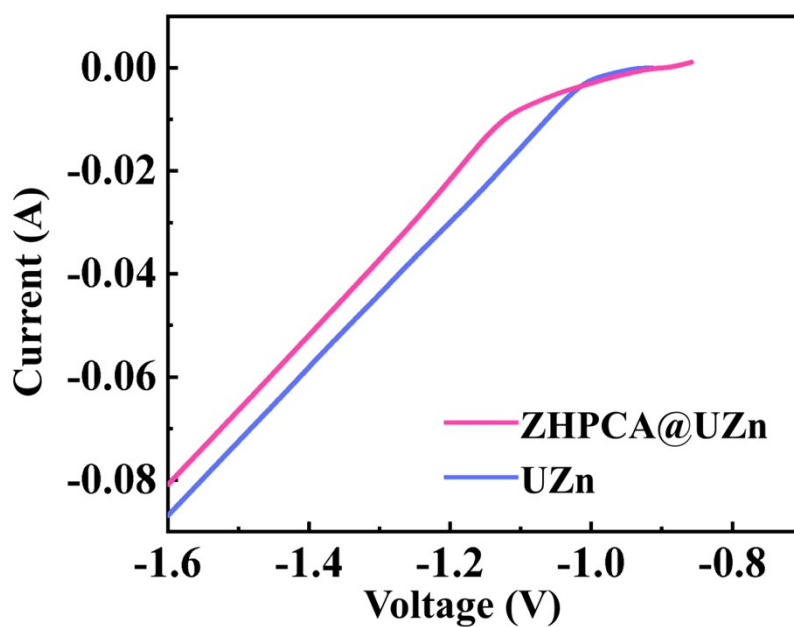
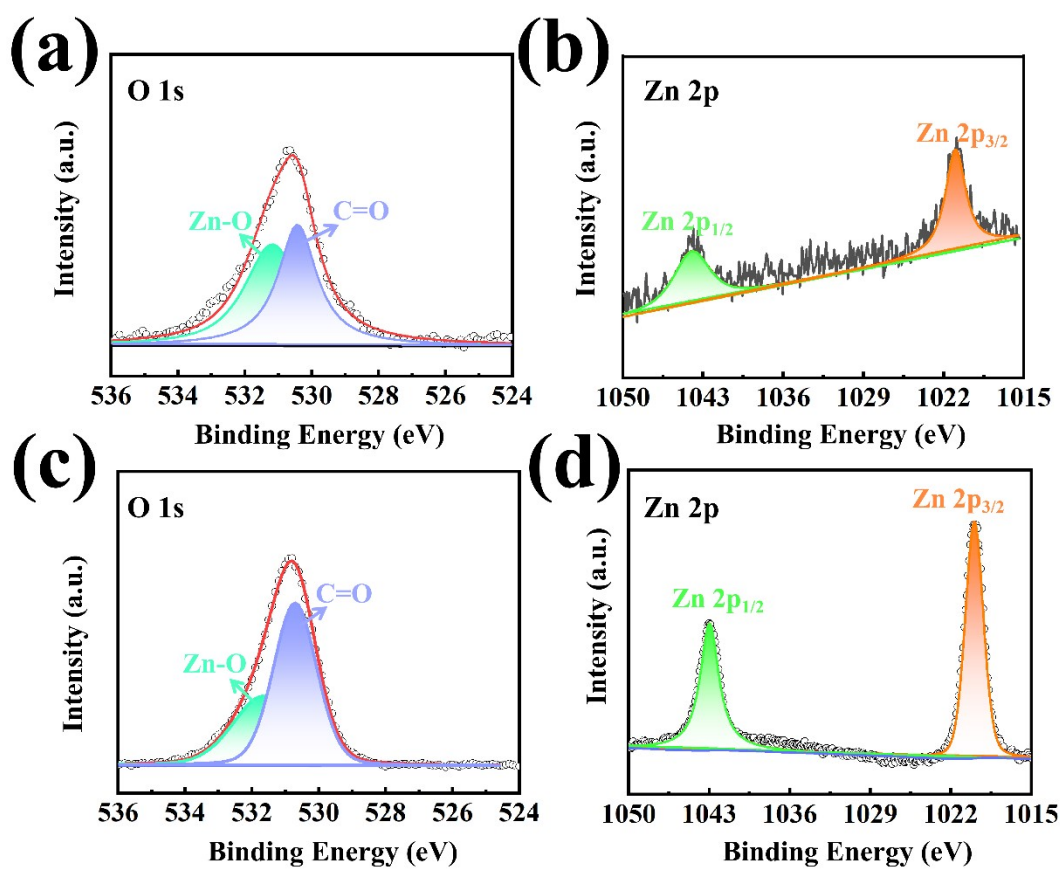
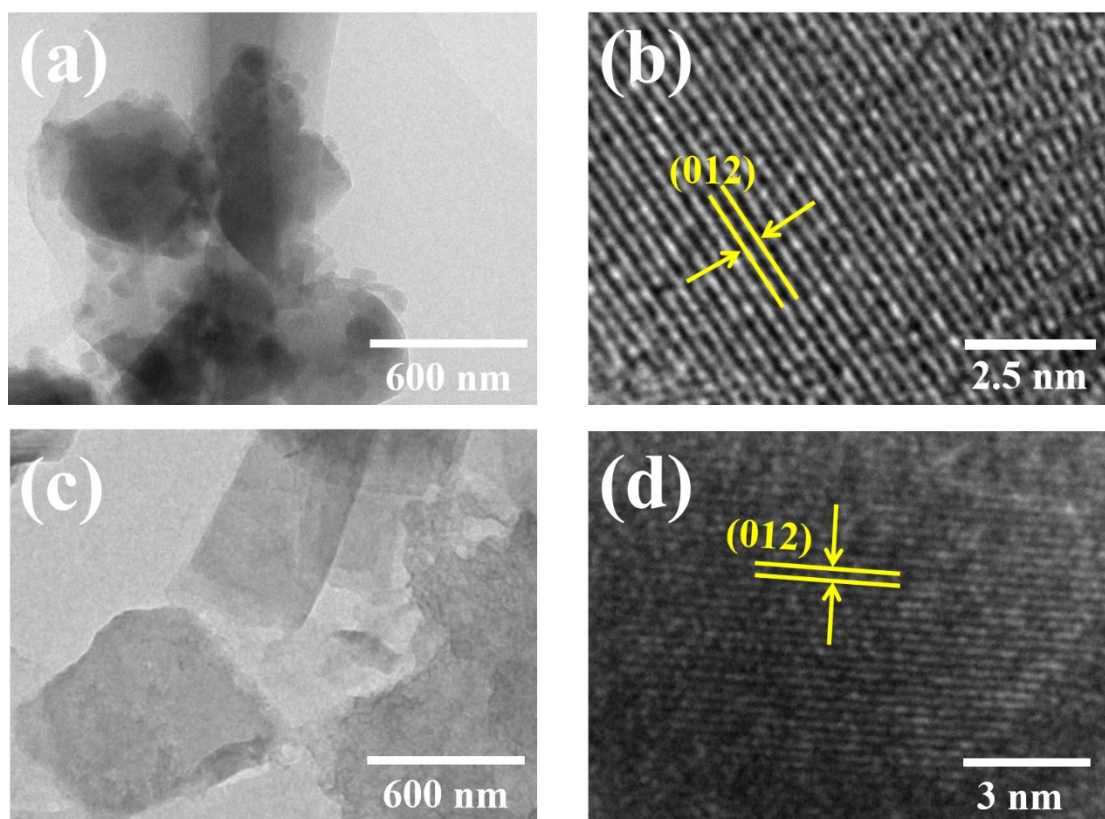


Fig. S9. LSV curves in 2 M Zn<sub>2</sub>SO<sub>4</sub> of UZn and ZHPCA@UZn.



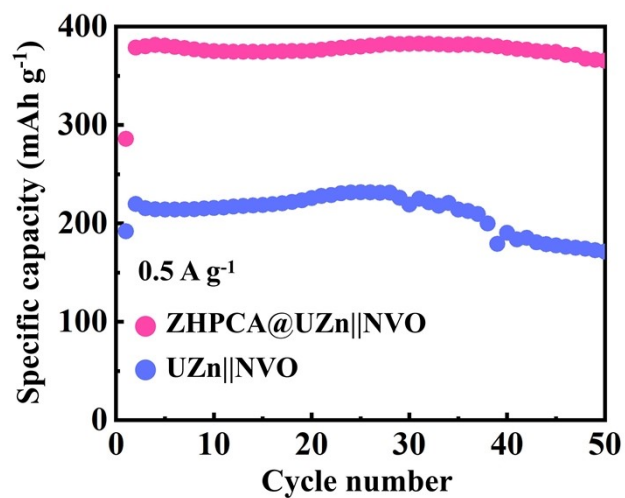
**Fig. S10.** High-resolution XPS spectra of O 1s, and Zn 2p for ZHPCA@UZn (a, b) before and (c, d) after cycling.



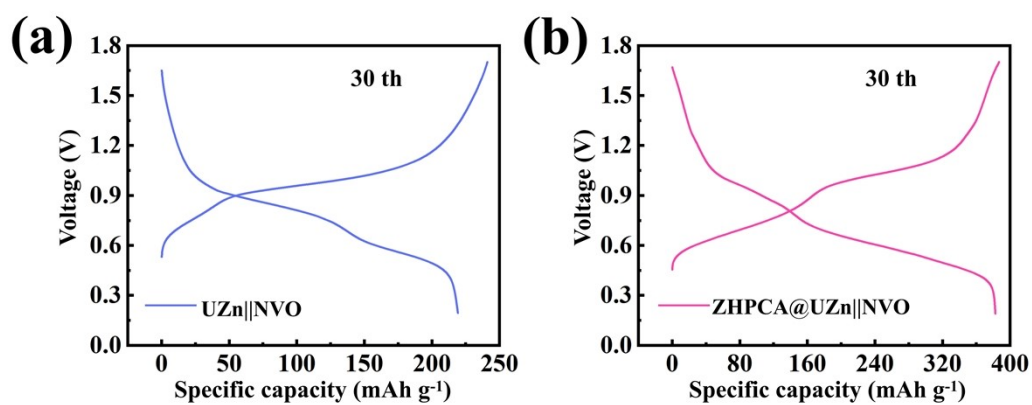
**Fig. S11.** (a) TEM image and (b) HRTEM image of the ZHPCA@UZn before cycling. (c) TEM image and (d) HRTEM image of the ZHPCA@UZn after 10 cycles at  $3 \text{ mA cm}^{-2}$  and  $1 \text{ mAh cm}^{-2}$ .



**Fig. S12.** Application of ZHPCA@UZn in capacitors.



**Fig. S13.** Cycle performance of ZHPCA@UZn||V<sub>2</sub>O<sub>5</sub> and UZn||V<sub>2</sub>O<sub>5</sub> full cells at 0.5 A g<sup>-1</sup>.



**Fig. S14.** Voltage curves of (a) UZn||V<sub>2</sub>O<sub>5</sub> and (b) ZHPCA@UZn||V<sub>2</sub>O<sub>5</sub> full cells.