Supporting Information

Zeolitic imidazolate frameworks derived ZnCo2O4 hollow tubular nanofibers for long-life supercapacitors

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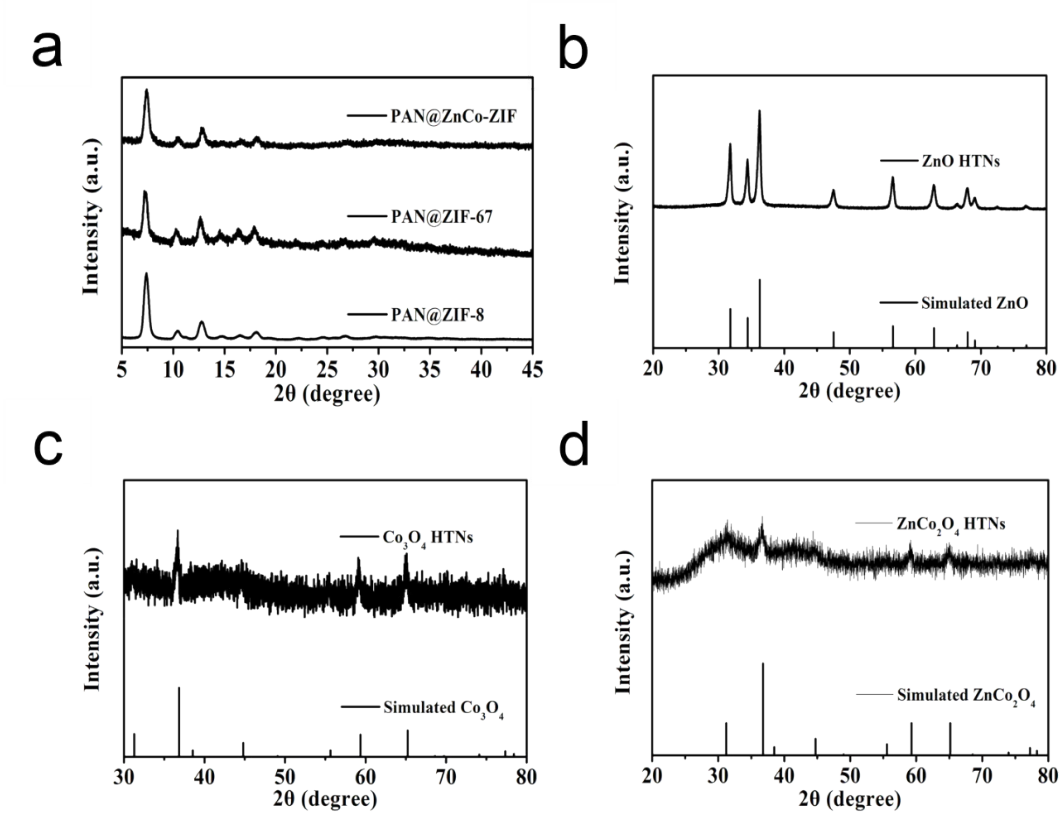

Fig S1. XRD patterns of (a) PAN@ZIF-8, PAN@ZIF-67 and PAN@ZnCo-ZIF, (b) ZnO HTNs, (c) Co_3O_4 HTNs, (d) $ZnCo_2O_4$ HTNs.

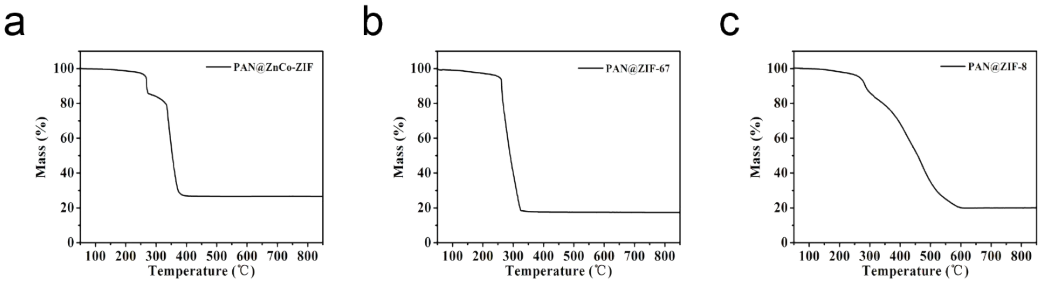

Fig S2. TGA curves of (a) PAN@ZnCo-ZIF, (b) PAN@ZIF-8 and (C) PAN@ZIF-67.

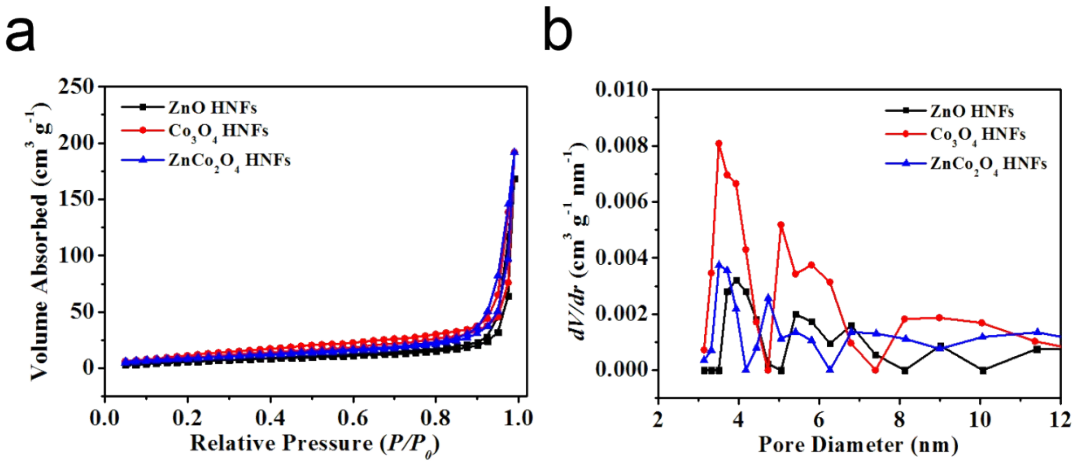

Fig S3. Nitrogen adsorption-desorption isotherms (a) and corresponding pore-size distribution curves (b) of $ZnCo_2O_4$ HTNs, ZnO HTNs and Co_3O_4 HTNs. (The pore size distribution of ZnO HTNs and Co_3O_4 HTNs are concentrated at 4 nm and 3.5 nm, and the specific surface area are 23.852 m^2 g and 38.979 m^2 g, respectively.)

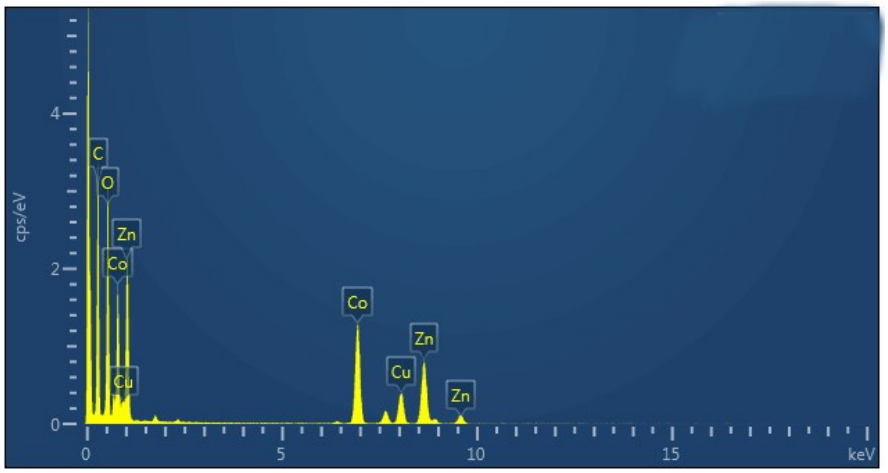

Fig S4. EDX image of $ZnCo_2O_4$ HTNs.

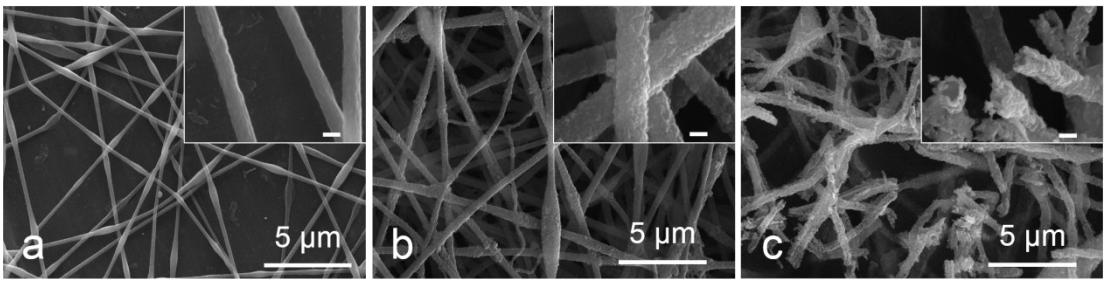

Fig S5. SEM images of (a) PAN@$Zn(Ac)_2$ composite nanofibers; (b) PAN@ZIF-8 core-shell nanofibers and (c) ZnO HTNs. Scale bars in inset are 200 nm.

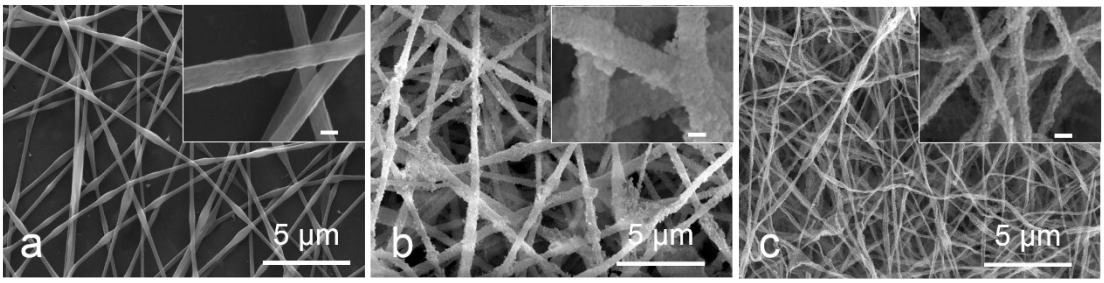

Fig S6. SEM images of (a) PAN@$Co(Ac)_2$ composite nanofibers; (b) PAN@ZIF-67 core-shell nanofibers and (c) Co_3O_4 HTNs. Scale bars in inset are 200 nm.

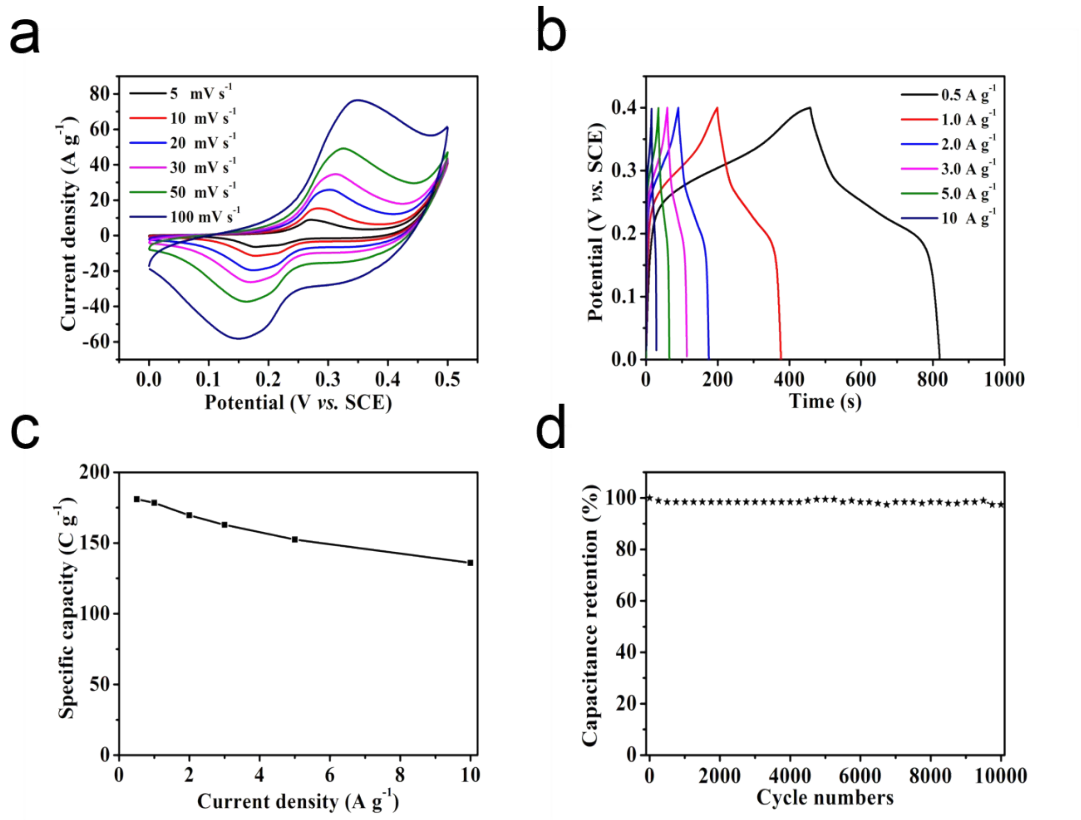

Fig S7. Electrochemical performance of $ZnCo_2O_4$ HTNs: (a) CV curves at different scan rates; (b) GCD curves at different current densities; (c) specific capacity at different current densities; (d) cycling performance at current density of 5 A g^{-1}.

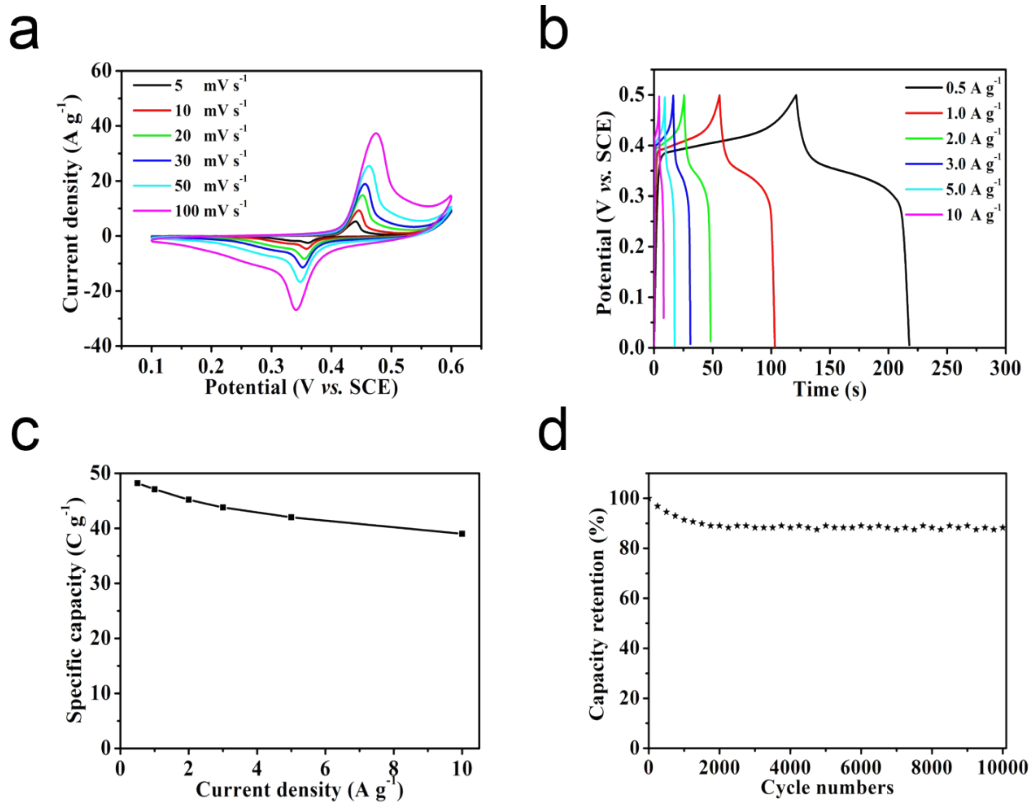

Fig S8. Electrochemical performance of ZnO HTNs: (a) CV curves at different scan rates; (b) GCD curves at different current densities; (c) specific capacity at different current densities; (d) cycling performance at current density of 5 A g^{-1}.

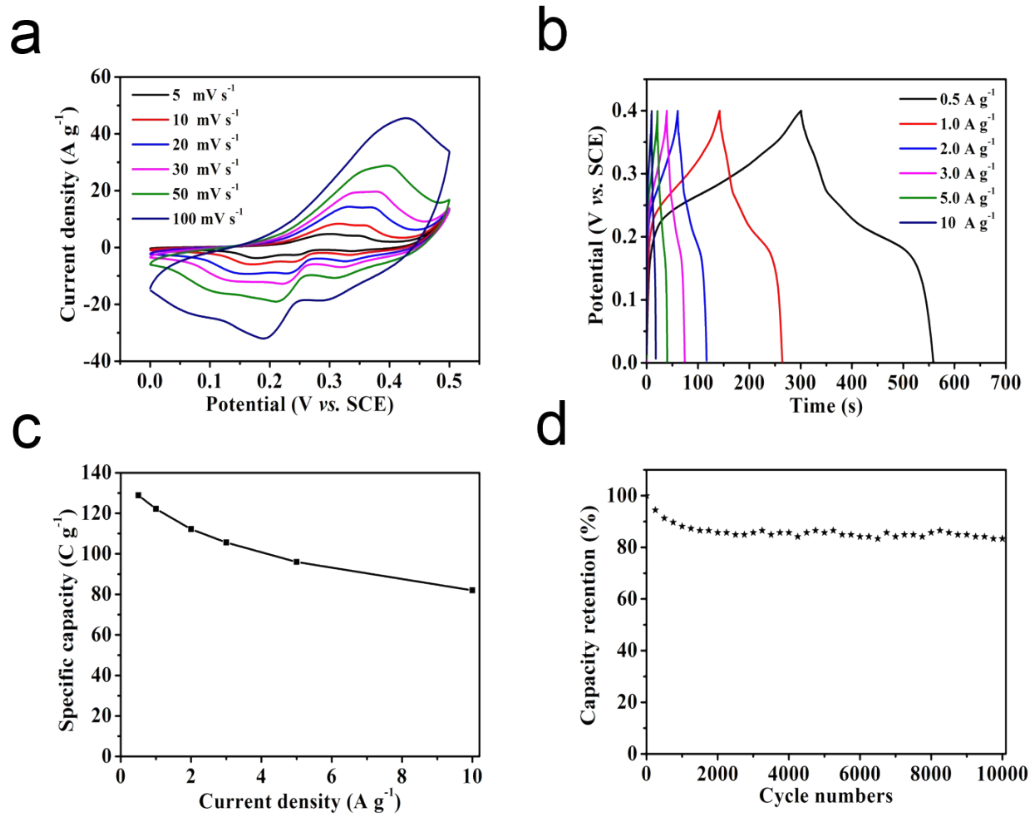

Fig S9. Electrochemical performance of Co_3O_4 HTNs: (a) CV curves at different scan rates; (b) GCD curves at different current densities; (c) specific capacity at different current densities; (d) cycling performance at current density of 5 A g^{-1}.

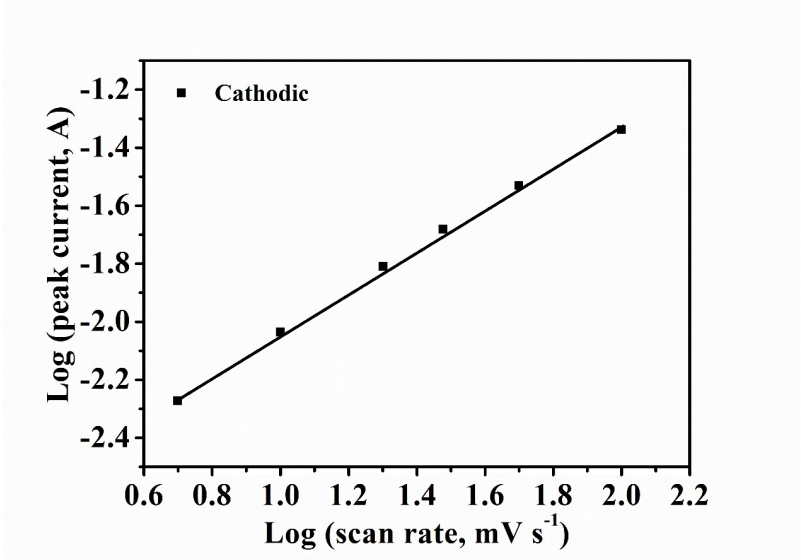

Fig S10. The plots of log(i) against log(v) of $ZnCo_2O_4$ HTNs.

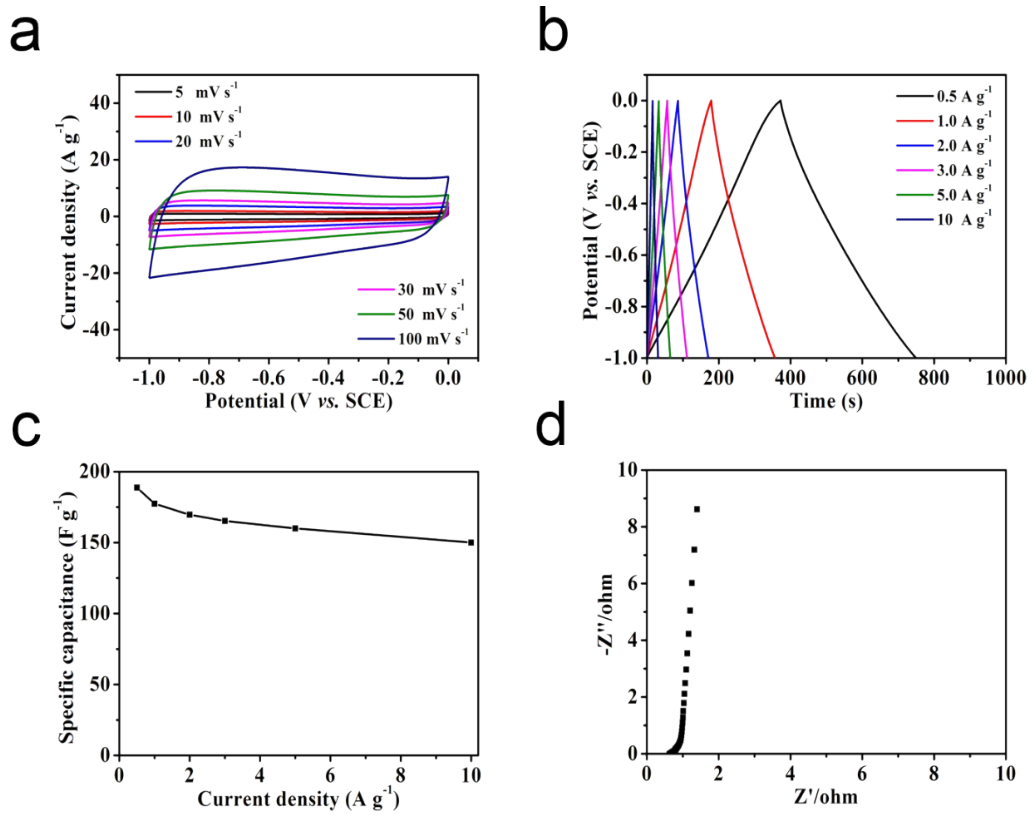

Fig S11. Electrochemical performance of AC: (a) CV curves at different scan rates; (b) GCD curves at different current densities; (c) specific capacitance at different current densities; (d) EIS spectra in Nyquist plots.

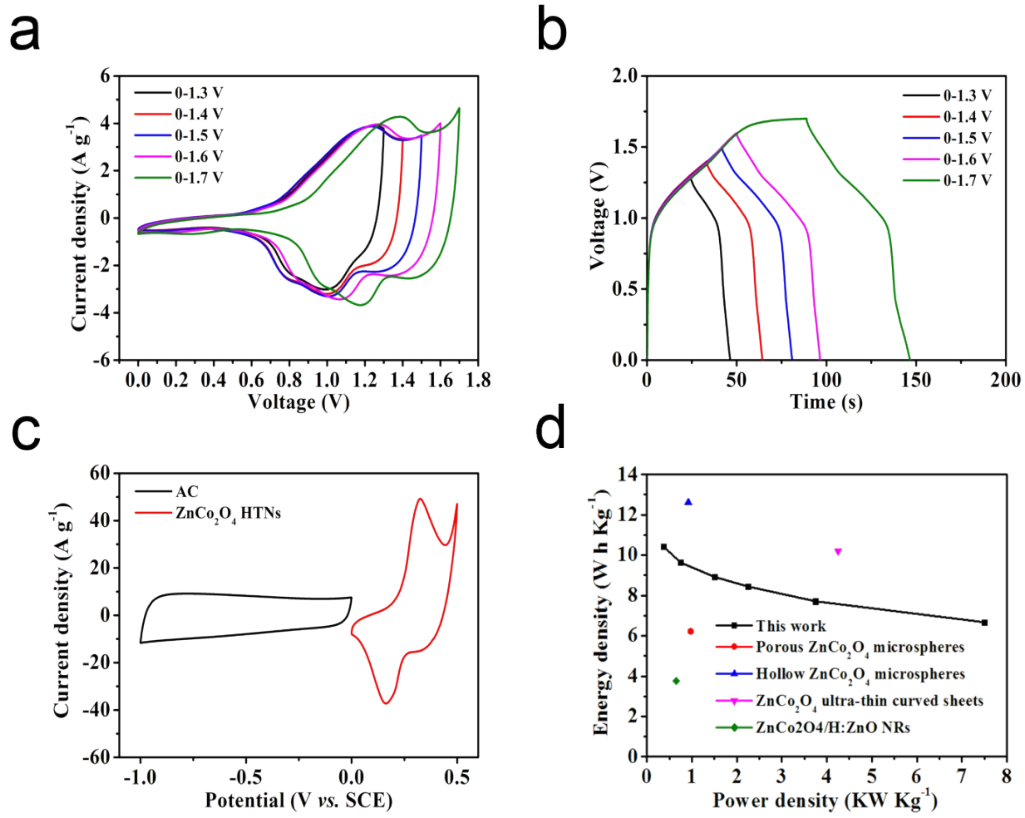

Fig S12. (a) CV curves with different voltage windows at the same scan rate of 50 mV s^{-1}; (b) GCD curves with different voltage windows at the same current density of 1 A g^{-1}; (c) CV curves of $ZnCo_2O_4$ HTNs and AC electrodes at the scan rate of 50 mV s^{-1}; (d) Ragone Plot of the $ZnCo_2O_4$ HTNs//AC ASC, in comparison with report data.

Tabel S1. Electrochemical performance comparison of $ZnCo_2O_4$ HTNs with related materials previously reported in supercapacitors.

Electrode	C (C g^{-1})	Current density	Cycle performance (cycle numbers)	Ref.
$ZnCo_2O_4$ nanoparticles	182.8	1 A g^{-1}	97.9% (1500)	S1
$ZnCo_2O_4$ microspheres	217	1 A g^{-1}	95.5% (2000)	S2
$ZnCo_2O_4$ nanoflakes	146.664	2 mA cm^{-1}	95.1% (2000)	S3
Peony-like $ZnCo_2O_4$	242	1 A g^{-1}	155.6% (3000)	S4
$ZnCo_2O_4$ microspheres	284	1 A g^{-1}	145% (2000)	S5
$ZnCo_2O_4$ nanowires	132	5 A g^{-1}		S6
$ZnCo_2O_4$ HTNs	181	0.5 A g^{-1}	97.42% (10000)	**This work**

References

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