A flexible solid-state zinc ion hybrid supercapacitors based on co-polymer derived hollow carbon spheres

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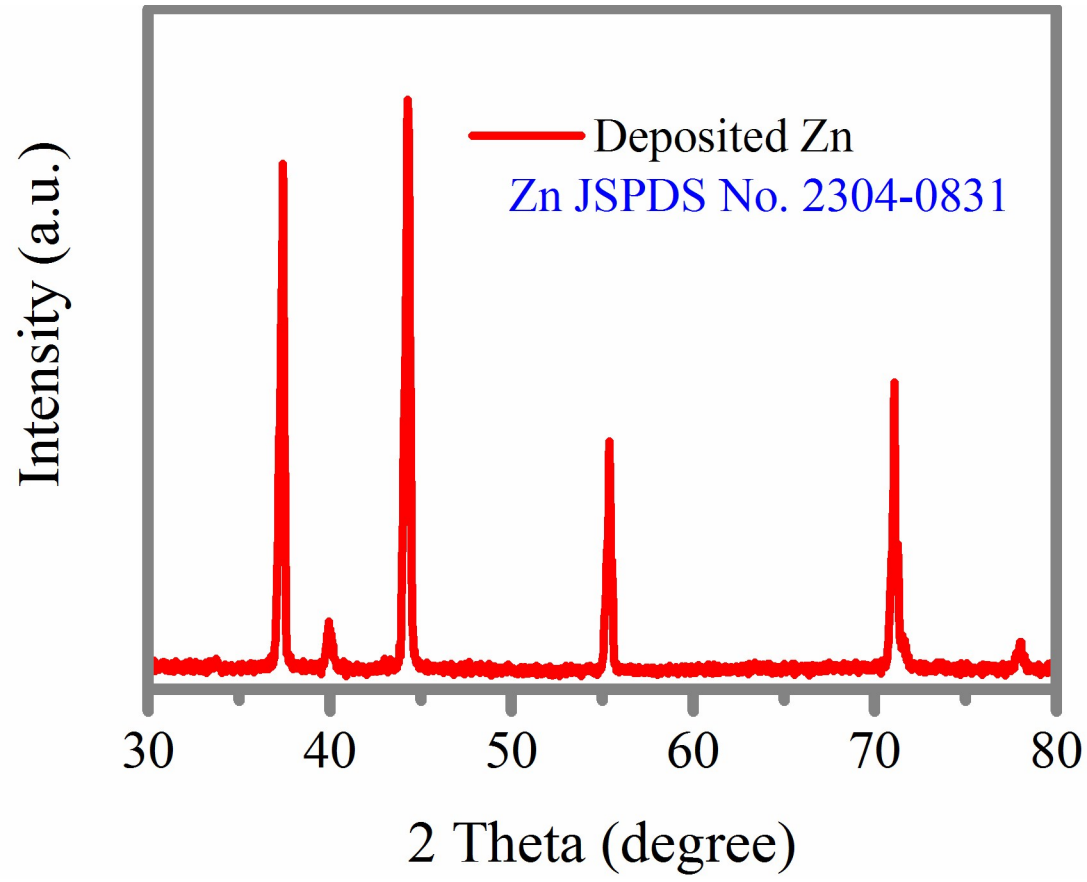

Fig. S1. XRD pattern of deposited-Zn on carbon cloth. It is indexed to metallic zinc (Zn JSPDS No. 2304-0831).

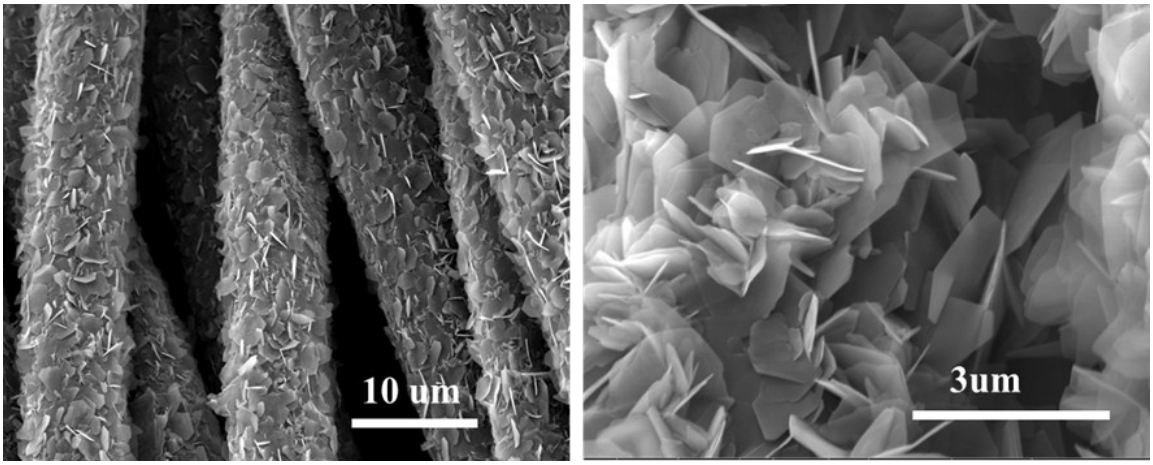

Fig. S2. SEM images of deposited-Zn on carbon cloth at different magnifications.

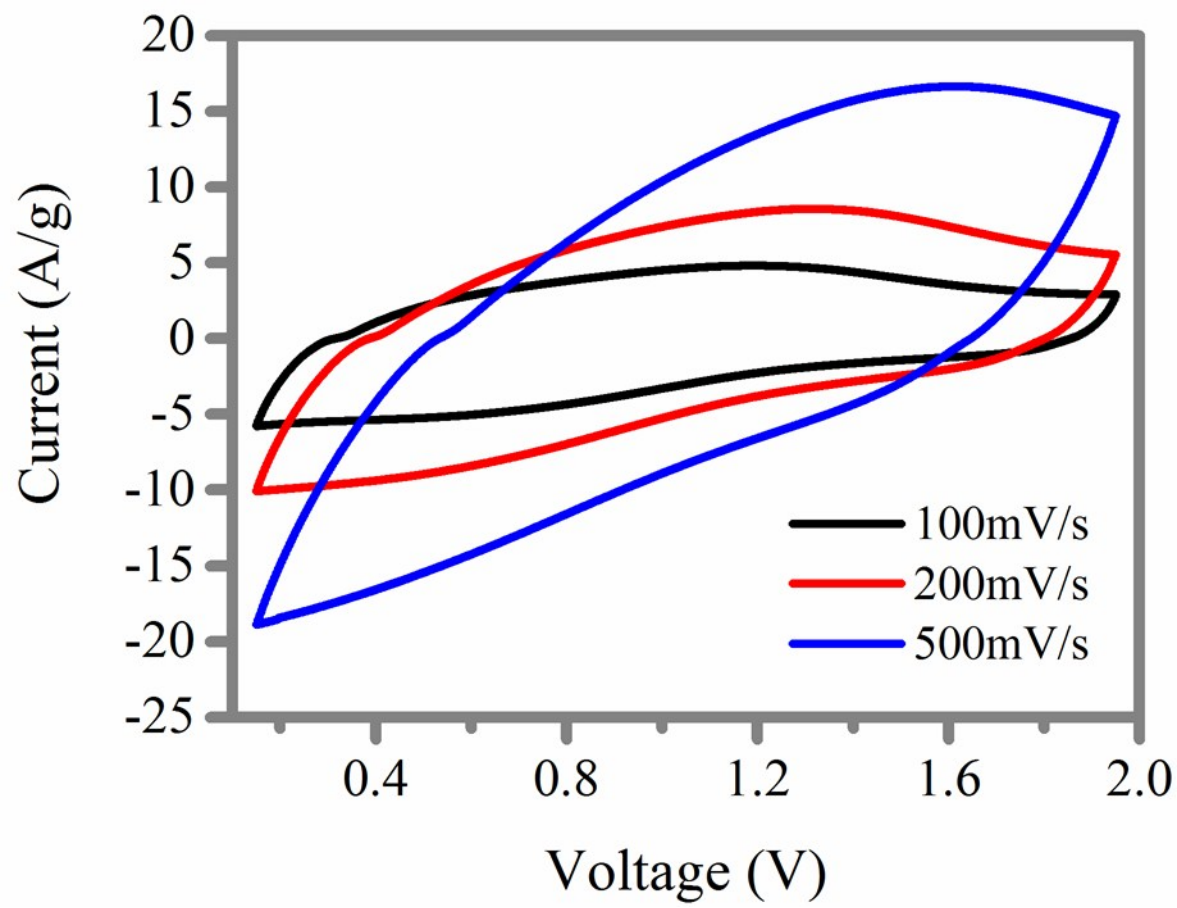

Fig. S3. CV curves of solid-state ZHS using HCS as cathode at higher scan rates from 100-500 mV/s.

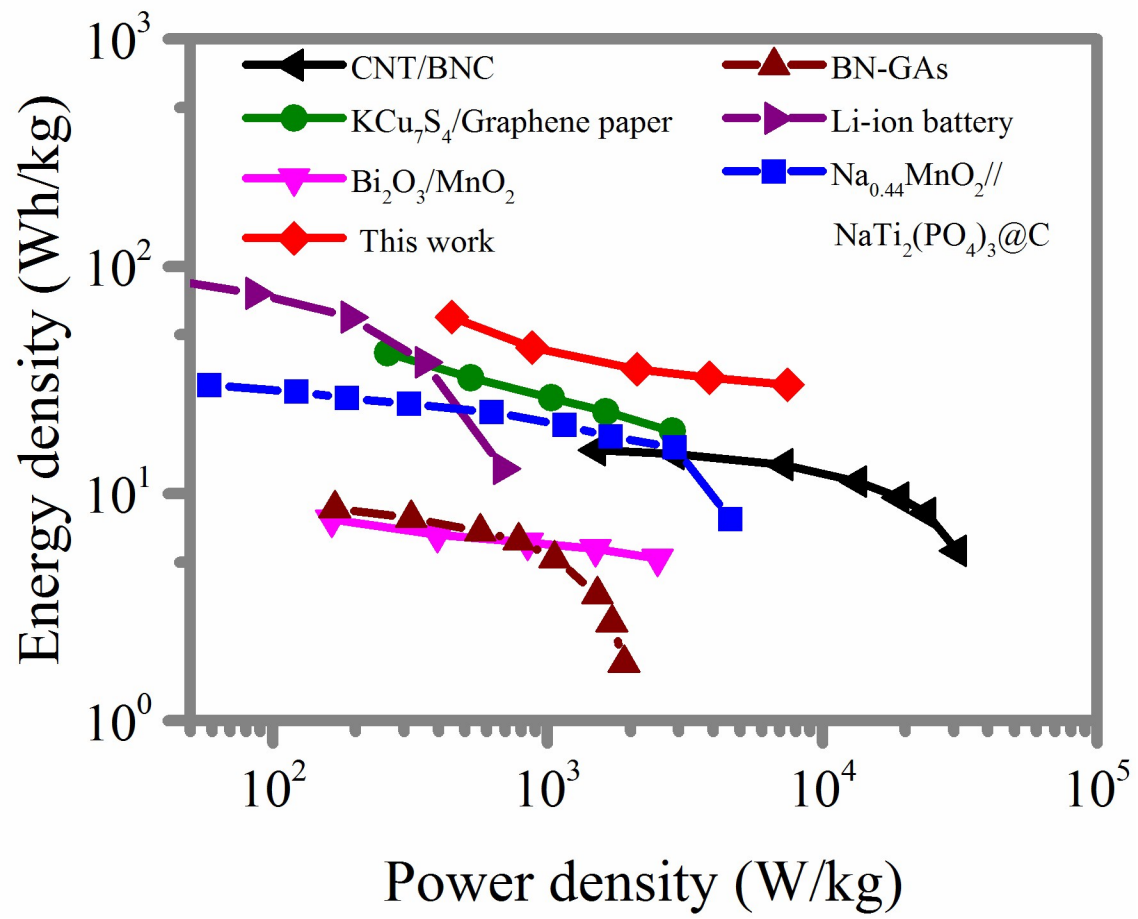

Fig. S4. Ragone plots of flexible solid-state ZHS using HCS as cathode (red line, this work) and other flexible energy storage devices: black line, CNT/BNC/ion gel-based all-solid-state supercapacitor[1]; green line, KCu_7S_4/GP based all-solid-state supercapacitor[2]; pink line, Bi_2O_3//MnO_2-asymmetric supercapacitor[3]; brown line, BN-Gas based all-solid-state supercapacitor[4]; purple line, lithium-ion battery[5]; blue line, $Na_{0.44}MnO_2$//$NaTi_2(PO_4)_3$@C based flexible aqueous sodium-ion battery[6].

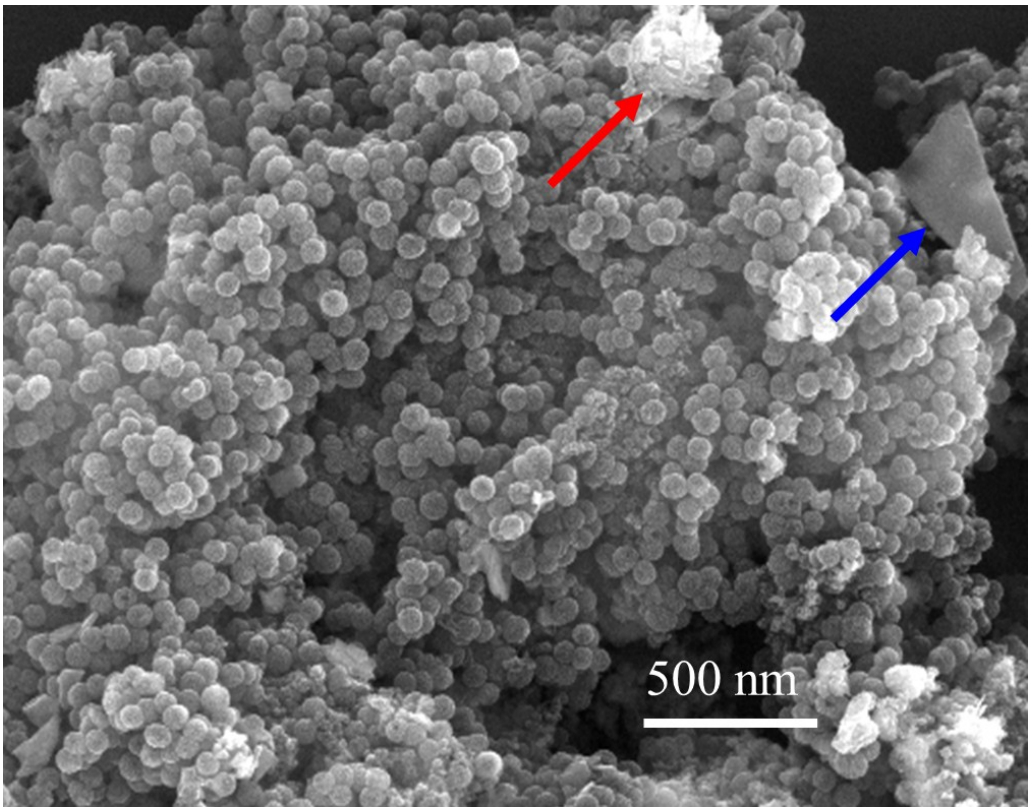

Fig. S5. SEM image of the cathode materials after cycling stability tests over 15,000 cycles. The red arrow indicates the electrolyte remnant and the blue arrow indicates the side reaction product flake-like $Zn_4SO_4(OH)_6•5H_2O$.

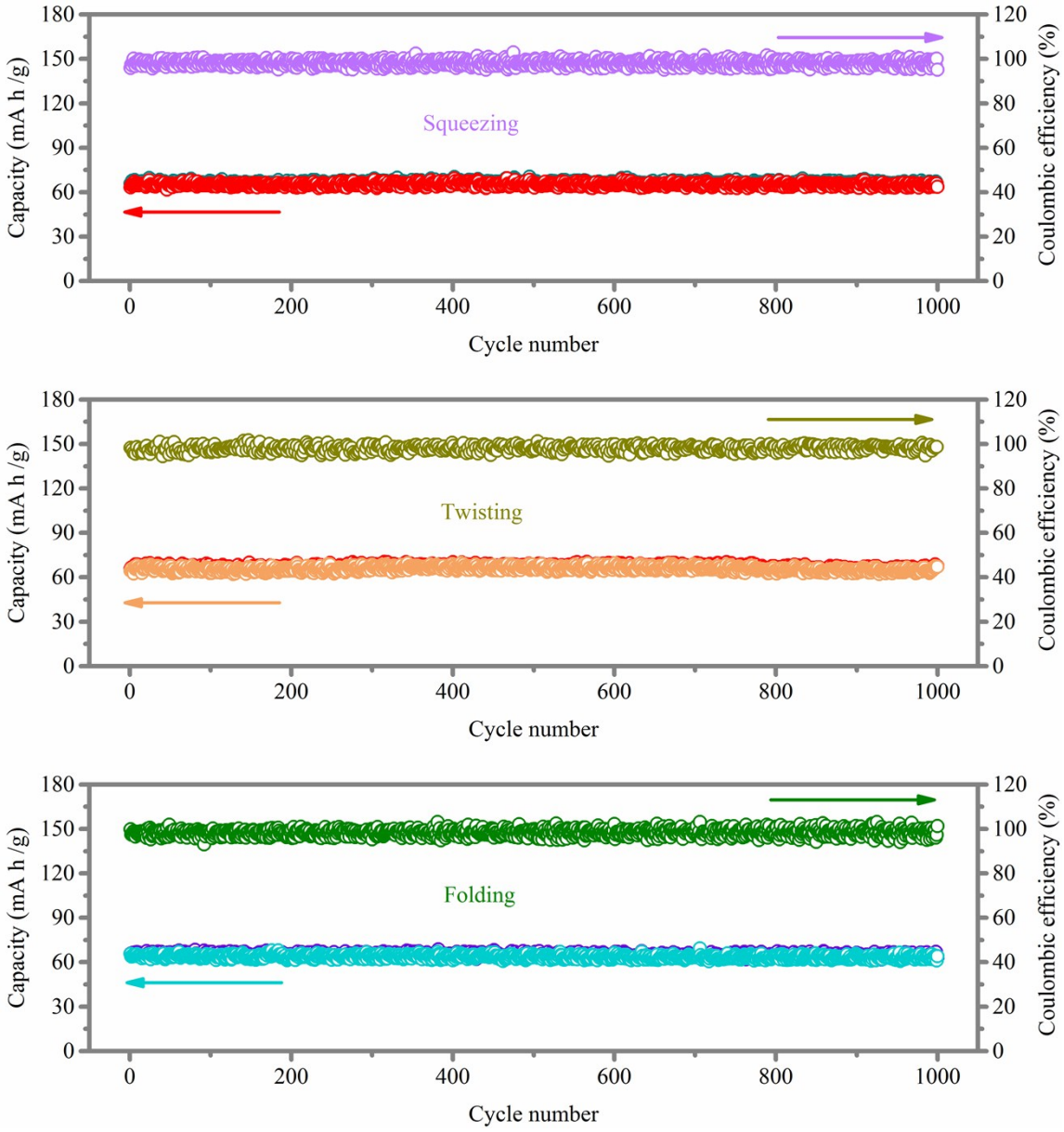

Fig. S6. Cycling stability of the flexible solid-state ZHS under various deformation conditions using an especially designed stepper motor for 1000 cycles at a current density of 1.0 A/g.

References

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