

Ultra-high energy density flexible asymmetric supercapacitor based on hierarchical fabric decorated with 2D bimetallic oxide nanosheets and MOF derived porous carbon polyhedrons

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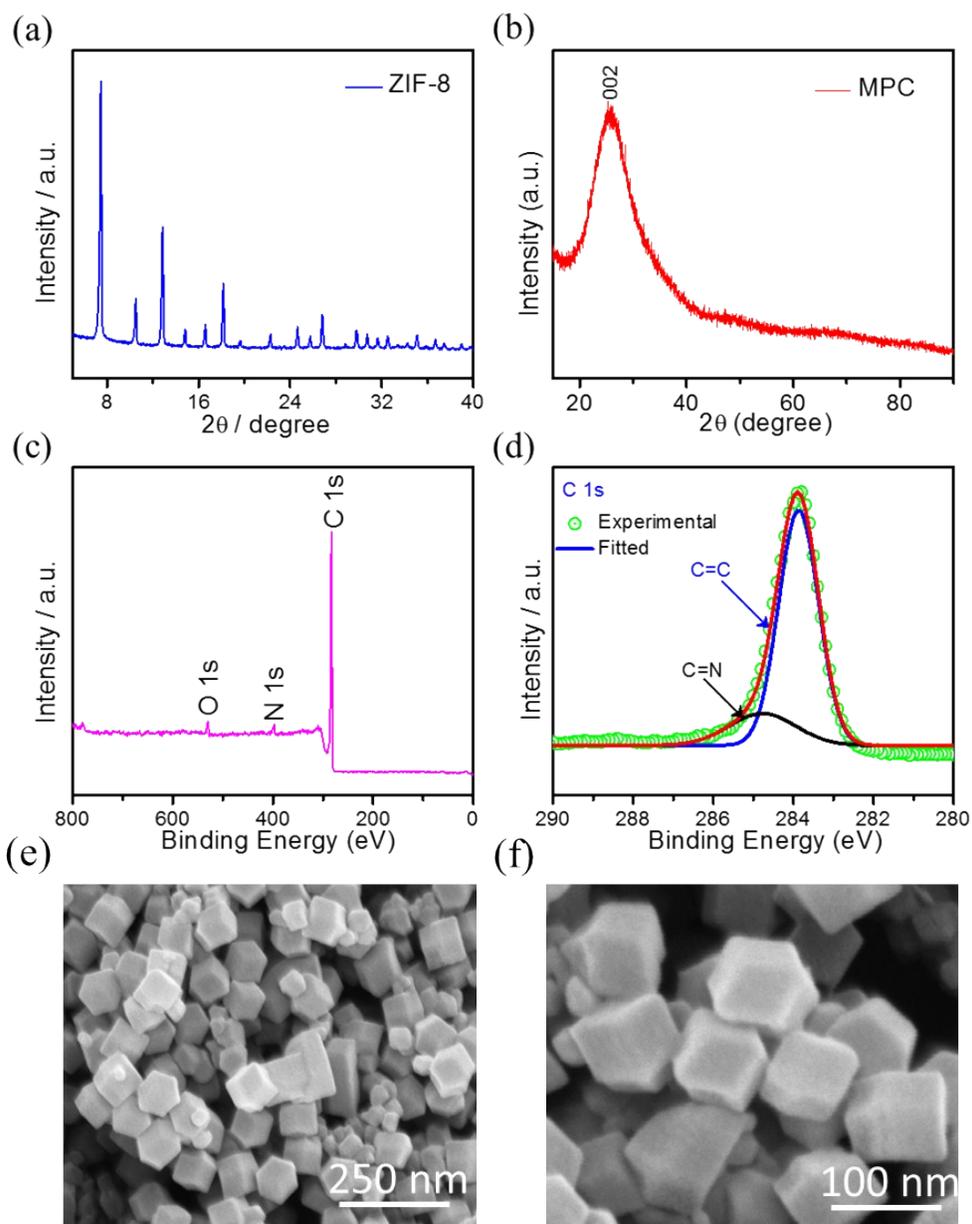


Fig. S1. (a) XRD pattern of bimetallic MOF precursor and (b) XRD pattern of bimetallic MOF derived nanoporous carbon (NPC). (c) XPS full survey of NPC and (d) De-convoluted XPS spectra of C 1s. (e-f) Low and high resolution FE-SEM images of bimetallic MOF precursor.

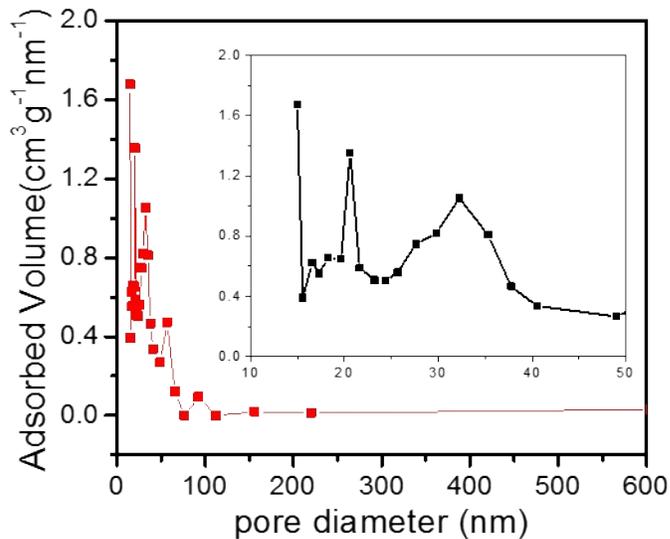
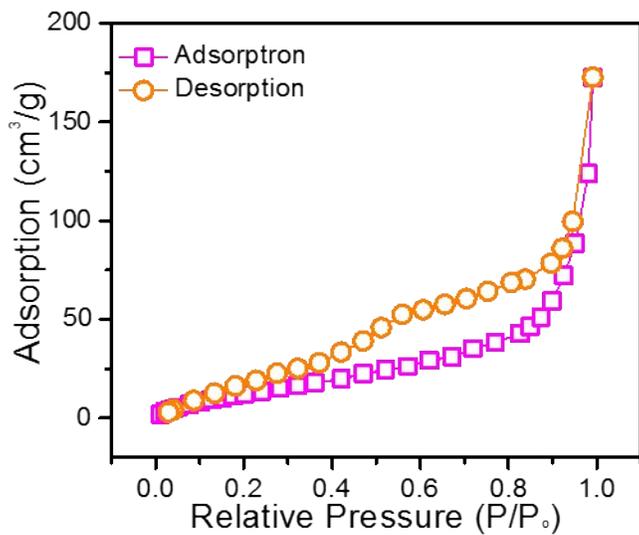


Fig. S2. (a) N₂ adsorption-desorption isotherms and pore size distribution curve derived using BJH method for bimetallic MOF-derived nanoporous carbon.

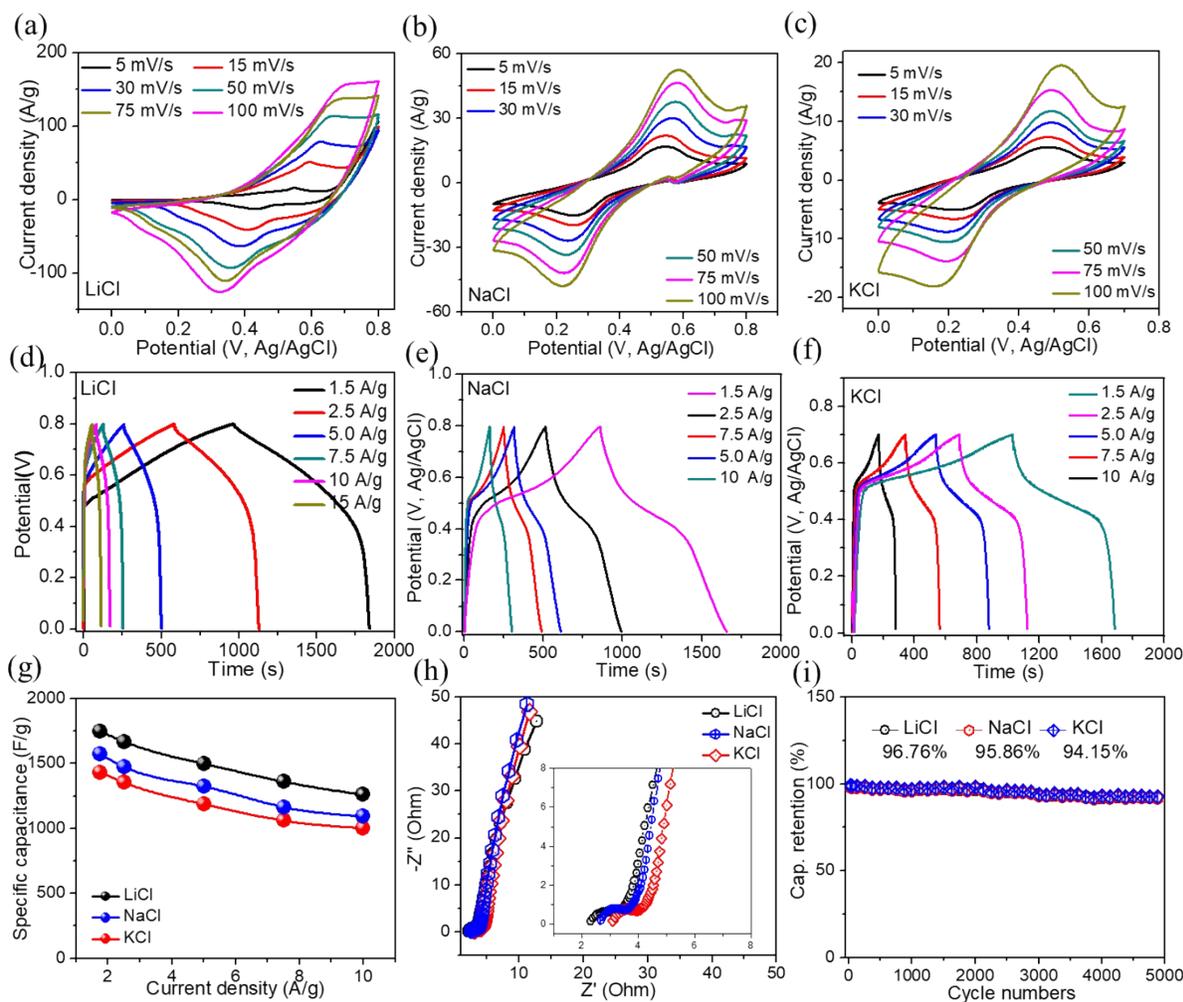


Fig. S3. Electrochemical performance of Zn-Co-O@CC electrode in various electrolytes; (a and d) CV and GCD curves in 6 M LiCl, (b and e) CV and GCD curves in 6 M NaCl and (c and f) CV and GCD curves in 6 M KCl. (g) Comparative specific capacitance in various electrolytes. (h) EIS spectrums in various electrolytes. (i) Cycling stability tests in various electrolytes.

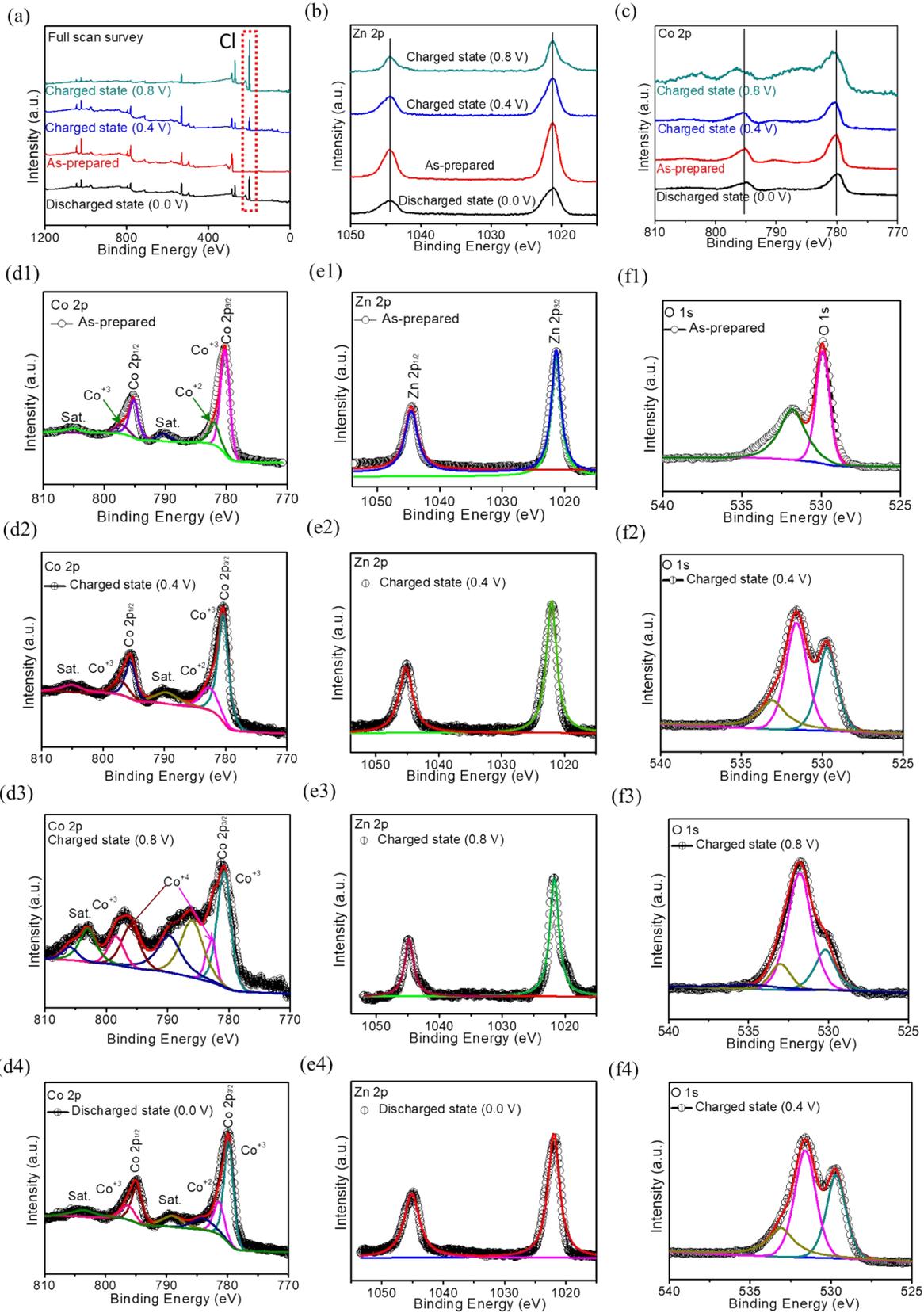


Fig. S4. XPS spectra at different charge/discharge states of Zn-Co-O@CC electrode in LiCl aqueous electrolyte. (a) Full scan survey, (b) Deconvoluted Zn 2p, (c) Deconvoluted Co 2p, (d1-d4) Deconvoluted Co 2p at various charge/discharge stages, (e1-e4) Deconvoluted Zn 2p at various charge/discharge stages, (f1-f4) Deconvoluted O 1s at various charge/discharge stages.

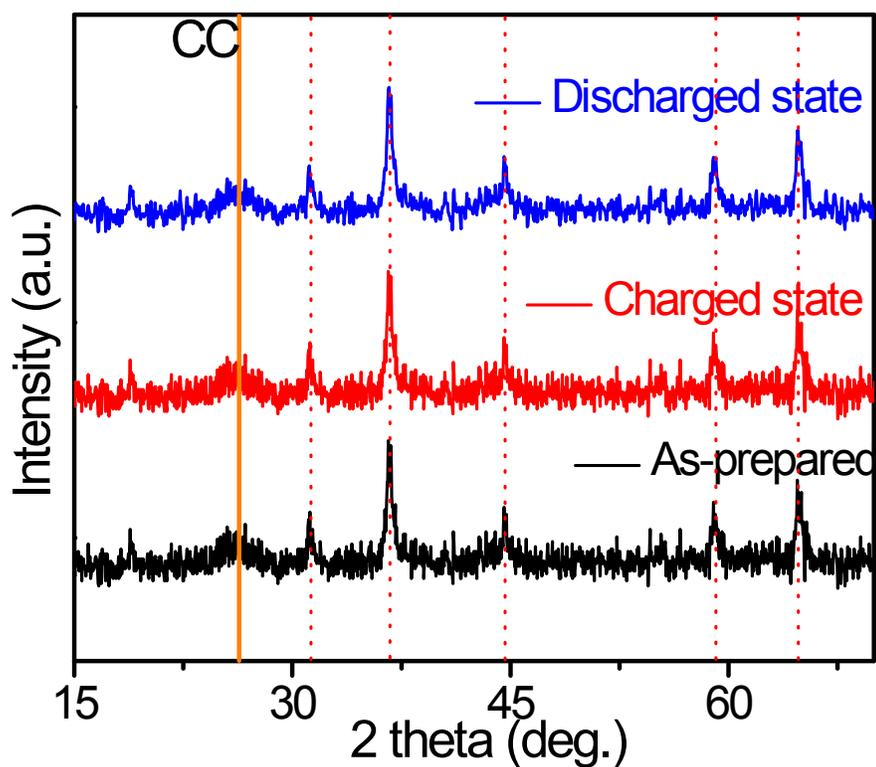


Fig. S5. XRD patterns of Zn-Co-O@CC electrode at various charge/discharge states in LiCl electrolyte.

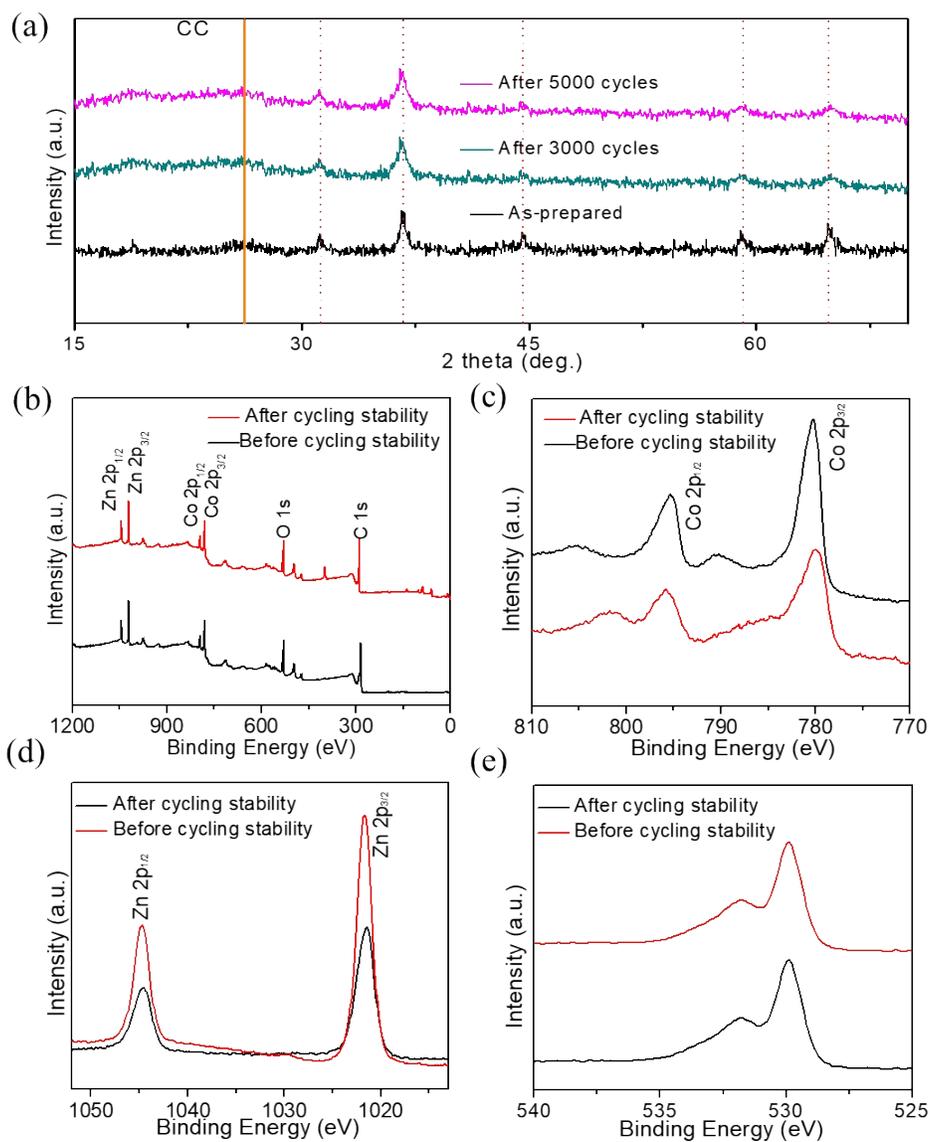


Fig. S6. XRD patterns and XPS survey spectra of Zn-Co-O@CC electrode before and after cycling stability tests in LiCl aqueous electrolyte. (a) XRD, (b) XPS full scan survey, (c) Co 2p, (d) Zn 2p and (e) O (1s).

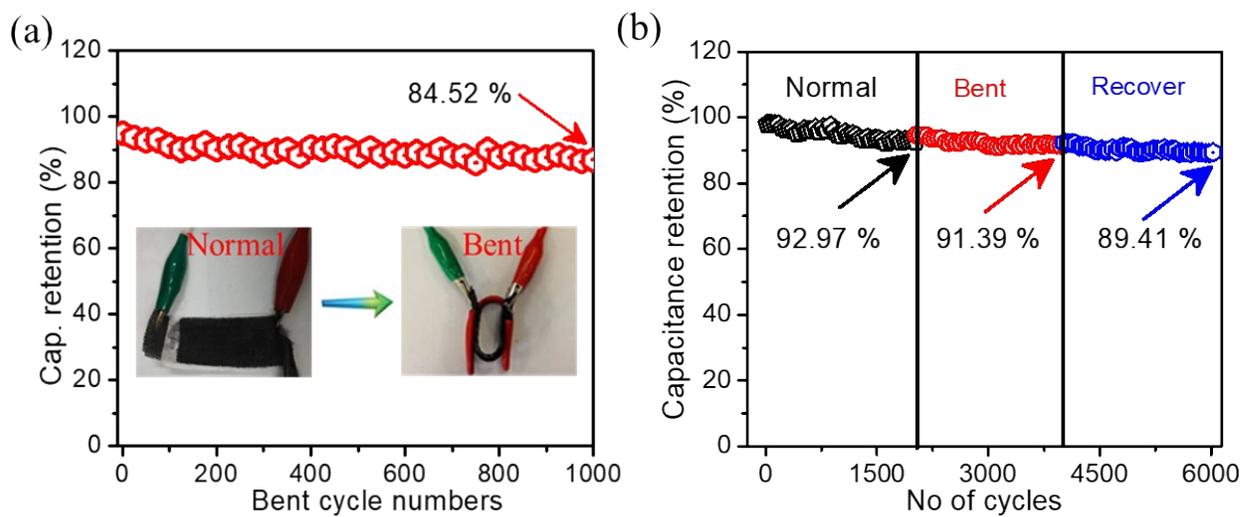


Fig. S7. Cycling stability tests of Zn-Co-O@CC/NPC@CC ASC (a) 1000 bending cycles (b) 2000 cycles for each condition normal, bent and recover.

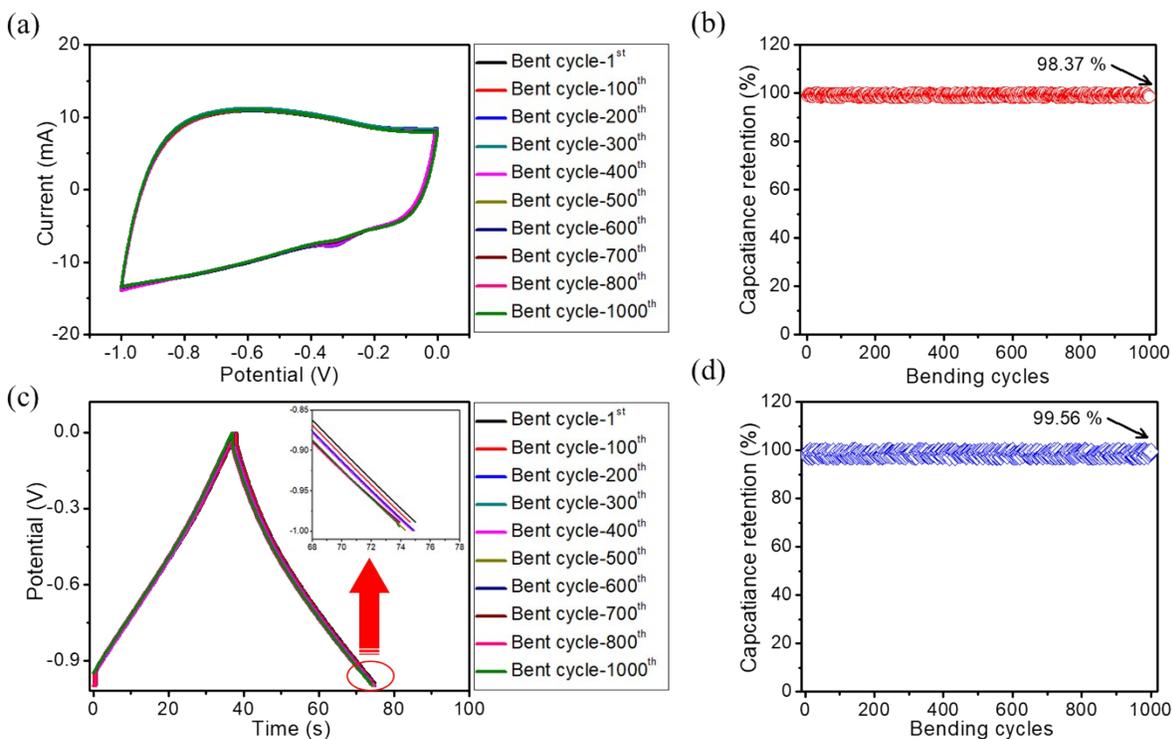


Fig. S8. Flexible performance of NPC@CC electrode in aqueous LiCl electrolyte. (a) CV curves at different bending cycles and (b) corresponding capacitance retention during 1000 bending cycles. (c) GCD curves at different bending cycles and (d) corresponding capacitance retention during 1000 bending cycles (inset shows the ending condition of GCD curves).

It is observed that the NPC@CC electrode possess good flexibility during 1000 times bending cycles (CV and GCD). The 1000 CV and GCD cycles were recorded for each bent state as shown in in Fig. S8 (a-d).

Supplementary References:

Note: These references are mentioned in Fig. 7 (a).

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