## Supporting Information

## Electrochemically Stable Cobalt-Zinc Mixed Oxide/Hydroxide Hierarchical Porous Film Electrode for High-performance Asymmetric Supercapacitor

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## The calculation of d-spacing based on XRD patterns:

The layer distance (d) is determined from the Bragg equation:  $n\lambda = 2d\sin\theta$ , where n equals an integer,  $\lambda$  is the wavelength of X-ray beams,  $2\theta$  is the scattering angle corresponding to the given diffraction peak. Here, n = 1,  $\lambda = 0.15406$  nm. Therefore, d = 0.15406 nm/2sin $\theta$ .

For example, the 2 $\theta$  values of (-115) and (200) facets of Zn<sub>2</sub>Co<sub>3</sub>(OH)<sub>10</sub>•2H<sub>2</sub>O are found to be 34.195 and 33.152 degree, respectively, based on Figure 3a and the standard XRD pattern of Zn<sub>2</sub>Co<sub>3</sub>(OH)<sub>10</sub>•2H<sub>2</sub>O (JCPDS 21-1477). Thus, the  $\theta$  values of (-115) and (200) facets are 17.098 and 16.576 degree, respectively. Based on d = 0.15406 nm/2sin $\theta$ , the d-115 and d<sub>200</sub> are calculated to be 0.26 and 0.27 nm, respectively.



**Figure S1.** (a) XRD pattern of pure cobalt based mixed oxide/hydroxide powder. (b) Comparisons of XRD patterns of CoZn-MOH-45-y powders within selected diffraction angle ranges.



**Figure S2.** (a)  $N_2$  (77 K) adsorption/desorption isotherms and (b) BJH pore size distribution curves of CoZn-MOH-45-110 powder.



**Figure S3.** Comparisons of (**a**) EDS spectra and (**b**) Nyquist plots of CoZn-MOH-45-y samples supported on nickel foam prepared with different reaction time.



**Figure S4.** SEM images of CoZn-MOH-45-y supported on nickel foam prepared with different reaction time: (**a**,**b**) 30, (**c**,**d**) 70, (**e**,**f**) 150, and (**g**,**h**) 190 min.



**Figure S5.** Comparisons of Nyquist plots: (**a**) Co-MOH-0-110 and CoZn-MOH-45-110 electrodes, (**b**) CoZn-MOH-x-110 electrodes prepared with different feeding molar percentage of zinc ion.



**Figure S6.** SEM images of CoZn-MOH-x-110 supported on nickel foam prepared with different feeding molar percentages of zinc ion: (**a**) 0%, (**b**) 33%, (**c**) 40%, (**d**) 45%, (**e**) 50%, and (**f**) 56%.



Figure S7. Galvanostatic CD curves of as-assembled CoZn-MOH-45-110//AC ASC.



Figure S8. (a,b) SEM images of CoZn-MOH-45-110 electrode after the cycling performance test.