

## Supporting Information

### Ni foam-supported Zn-Co-Ni ternary oxide nanosheet arrays derived from MOF precursor with enhanced performances for supercapacitor and Ni-Zn battery

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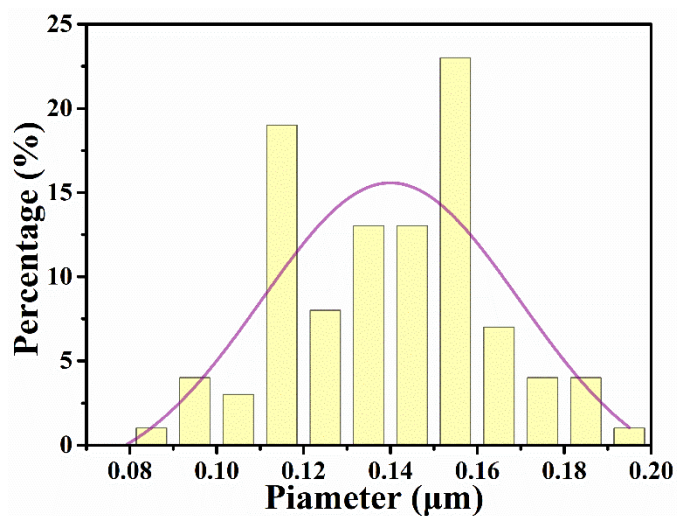


Fig. S1. Particle size distribution of the ZnCoNi-MOF precursor.

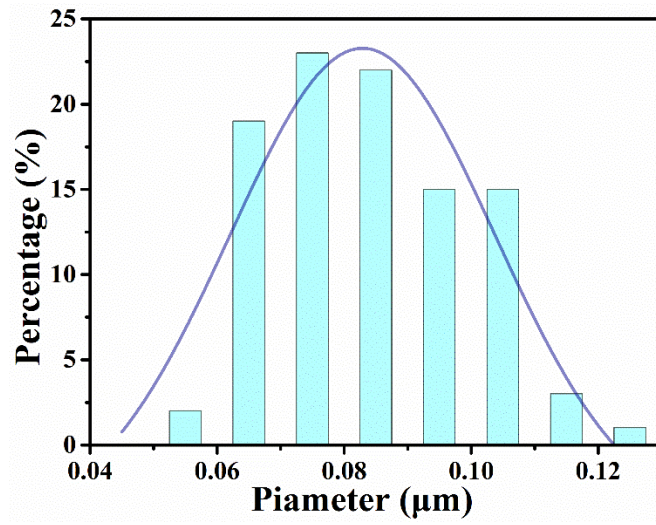


Fig. S2. The thickness distribution of the ZnCo<sub>2</sub>O<sub>4</sub>-NiO nanosheets.

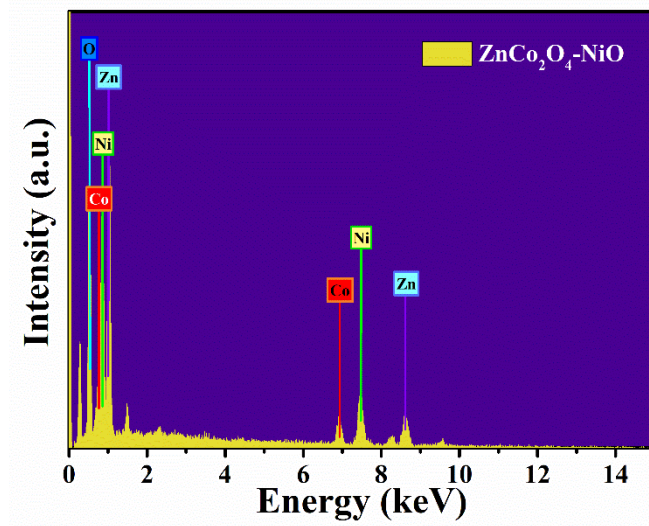


Fig. S3. Energy spectrum of ZnCo<sub>2</sub>O<sub>4</sub>-NiO sample.

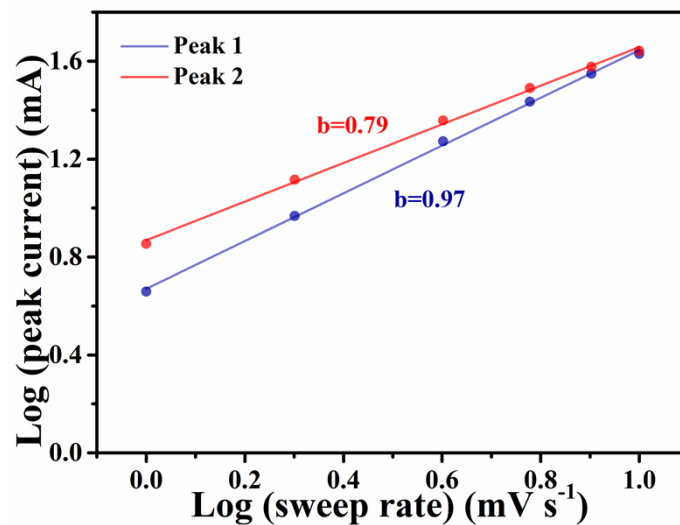


Fig. S4. The fitted  $b$  value corresponding to the redox peaks of  $\text{ZnCo}_2\text{O}_4\text{-NiO}$  electrode in three electrode system.

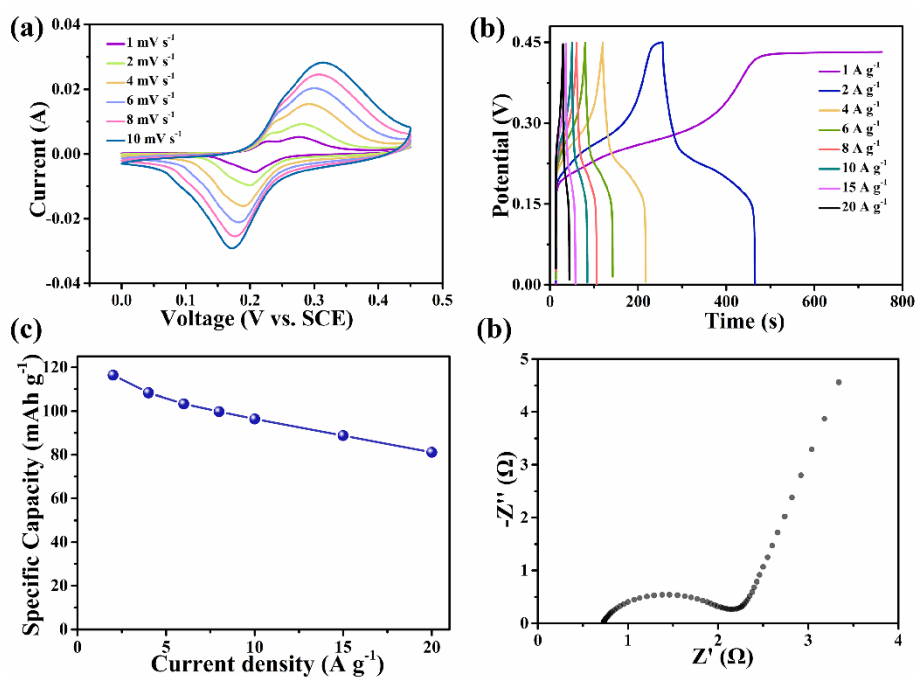


Fig. S5. (a) CV curves, (b) GCD curves, (c) specific capacity at different current density, and (d) EIS plot of  $\text{ZnCoNi-MOF}$  precursor electrode in three electrode system.

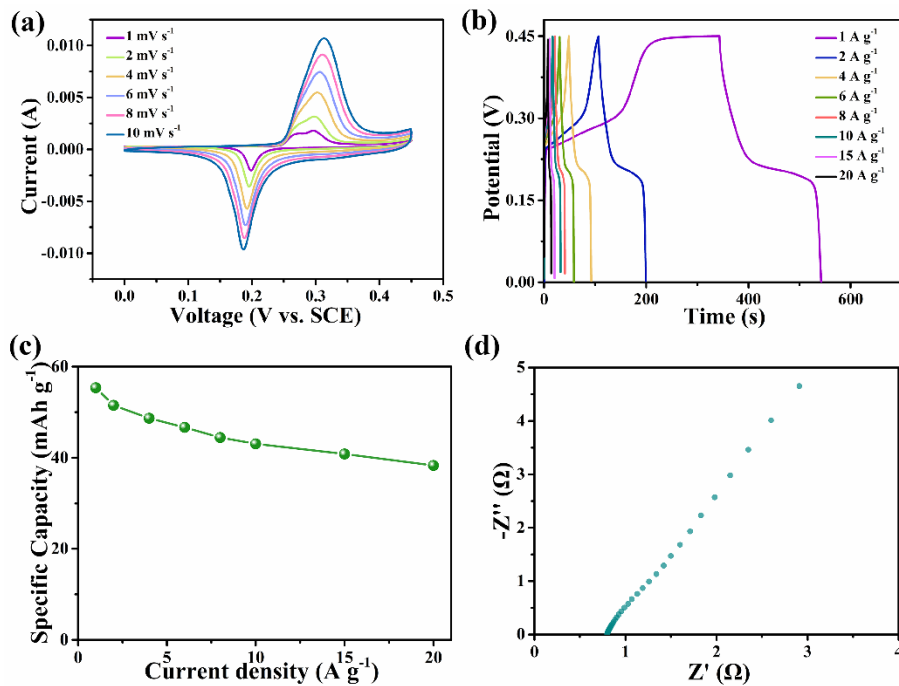


Fig. S6. The electrochemical performance of the ZnNi-oxide/NF electrode, (a) CV curves, (b) GCD curves, (c) specific capacity at different current density, and (d) EIS plot.

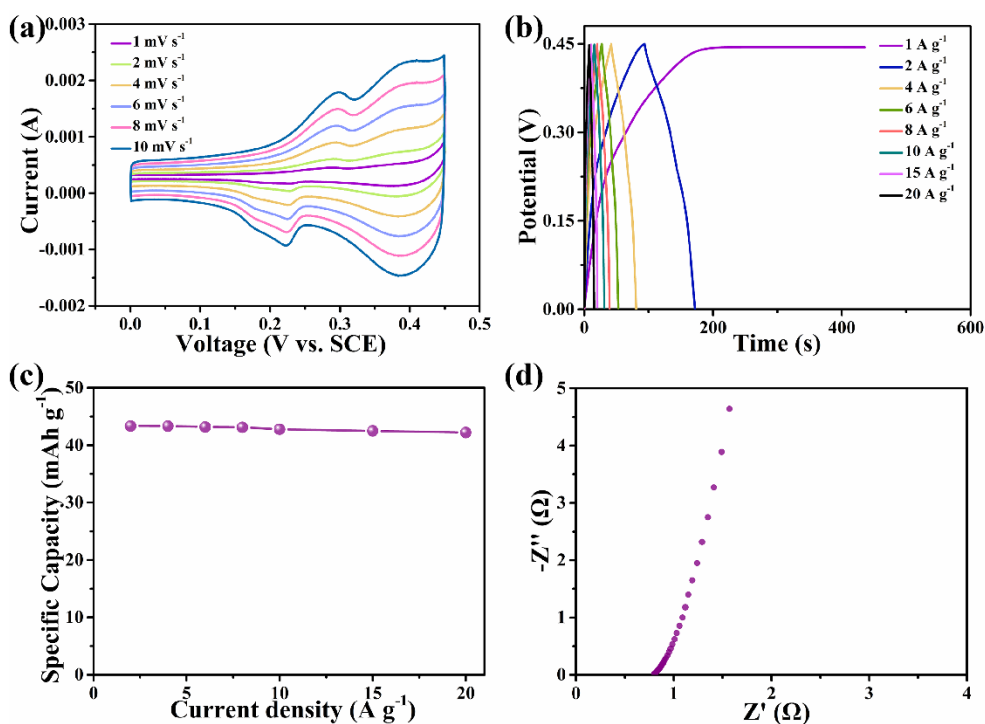


Fig. S7. The electrochemical performance of the ZnCo-oxide/NF electrode, (a) CV curves, (b) GCD curves, (c) specific capacity at different current density, and (d) EIS plot.

Table S1. EDS analysis of the elemental composition of ZnCo<sub>2</sub>O<sub>4</sub>-NiO samples.

Sample	Ni (at%)	Co (at%)	Zn (at%)	O (at%)
ZnCo <sub>2</sub> O <sub>4</sub> -NiO	30.77	7.27	13.68	48.28

Table S2. Comparison of specific capacity as supercapacitor for the as-synthesized electrodes.

Current densities	ZnCo <sub>2</sub> O <sub>4</sub> -NiO (mA h g <sup>-1</sup> )	ZnCoNi-MOF (mA h g <sup>-1</sup> )	ZnNi-oxide/NF (mA h g <sup>-1</sup> )	ZnCo-oxide/NF (mA h g <sup>-1</sup> )
1 A	196.67	—	55.36	—
2 A	189.44	116.39	51.50	43.35
4 A	182.89	108.33	48.67	43.33
6 A	178.00	103.33	46.67	43.17
8 A	173.78	99.78	44.44	43.11
10 A	168.89	96.39	43.06	42.78
15A	157.08	88.75	40.83	42.50
20 A	147.78	81.11	38.33	42.22

Table S3. Resistance comparison of different samples.

	ZnCo <sub>2</sub> O <sub>4</sub> -NiO/NF (Ω)	ZnCoNi-MOF/NF (Ω)	ZnNi-oxide/NF (Ω)	ZnCo-oxide/NF (Ω)
$R_s$	0.61	0.72	0.76	0.79
$R_{ct}$	0.17	1.23	16.60	0.47

Table S4. Comparison of the performances with various rechargeable aqueous Zn-based batteries.

Battery materials	Energy density (Wh/kg)	Power density (W/kg)	Ref
ZnO/Co <sub>3</sub> O <sub>4</sub> //Zn	36.6	356	47
Co <sub>3</sub> O <sub>4</sub> //Zn	241	1506	49
MoZ-12//Zn	65	650	53
PbO <sub>2</sub> //Zn	252.39	570.53	54
Ni <sub>2</sub> Zn-MgCo <sub>2</sub> O <sub>4</sub> //Zn	120.4	312	55
CuV <sub>2</sub> O <sub>6</sub> //Zn	317	210	56
A-Co(OH) <sub>2</sub> @NiCo-LDH//Zn	489.6	380	57
ZnNiP-0.5//RGO	67.4	825	58
<b>ZnCo<sub>2</sub>O<sub>4</sub>-NiO//Zn</b>	<b>322.47</b>	<b>1682.14</b>	<b>This work</b>