Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting information

Both Layered Trihydroxide Hollowcube and Bismuth Oxide Derived from MOF Templates for High-performance Alkaline Battery

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Calculation method: Specific capacity [1-3] (C_m, mAh g^{-1}) of the electrode materials and CoNiMn-LDH//Bi_2O_3 battery is reckoned as follows:

$$C_m = \frac{\int_0^t I dt}{m_c}$$

Where *t,* m_c and *I* are the discharge time (s), mass loading (g) and discharge current (A), severally. Energy density (*E*, Wh kg^{-1}) and power density (*P*, W kg^{-1}) of CoNiMn-LDH //Bi_2O_3 battery are calculated as follows:

$$E = C_m \times \Delta V$$

$$P = \frac{E}{\Delta t}$$

Here, Δt (s) and ΔV (V) are the discharging time and working potential.

N_2 adsorption–desorption isotherms and pore size distribution plot

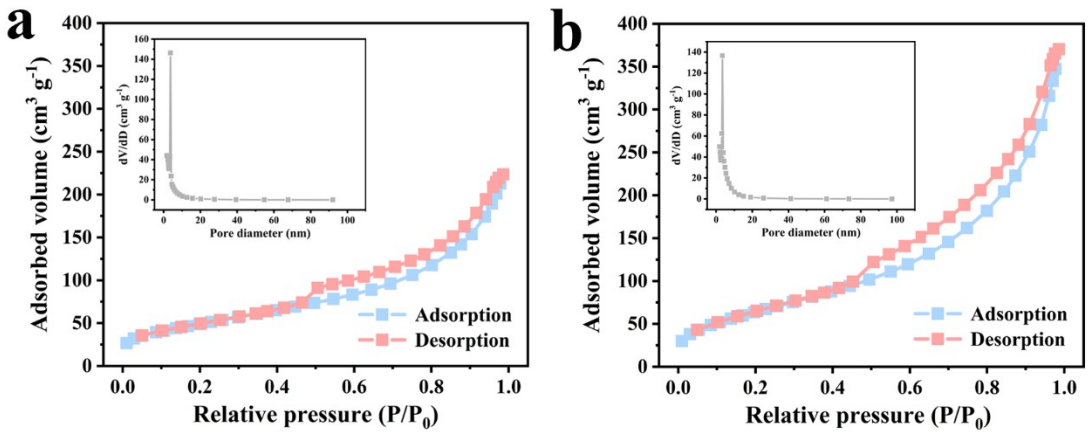

Fig. S1. (a) N_2 adsorption–desorption isotherms and pore size distribution plot for CoNi-LDH. (b) N_2 adsorption–desorption isotherms and pore size distribution plot for CoNiMn-LDH.

XPS spectra

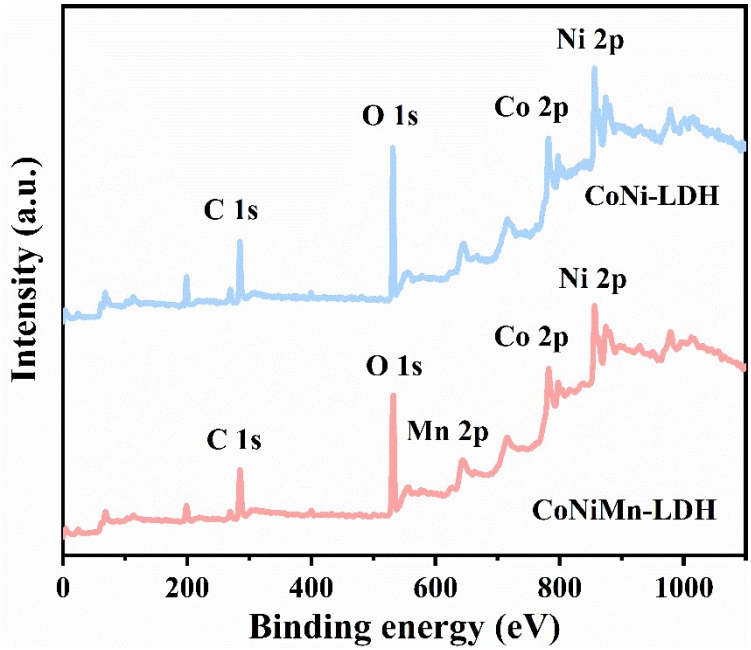

Fig. S2. The XPS survey of CoNi-LDH and CoNiMn-LDH.

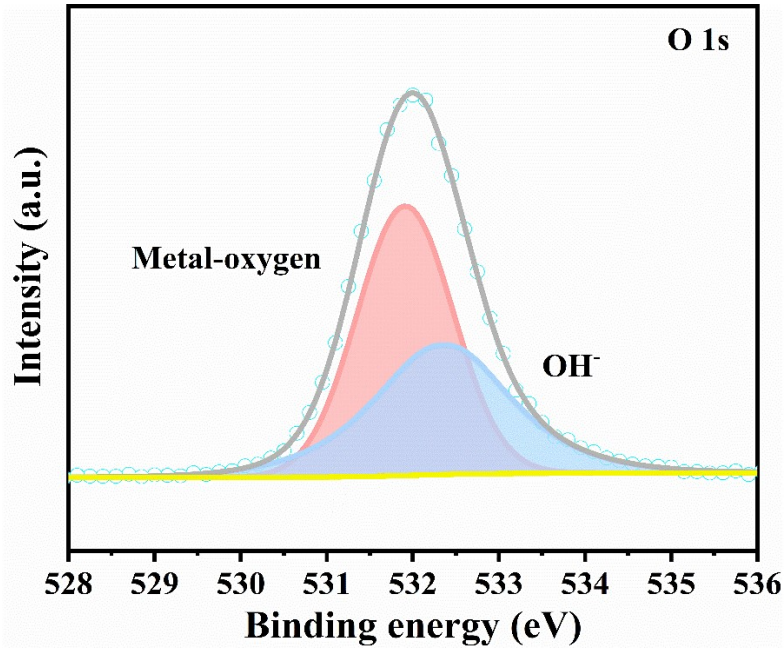

Fig. S3. High-resolution XPS spectra of the O 1s of CoNi-LDH.

Morphology characterization

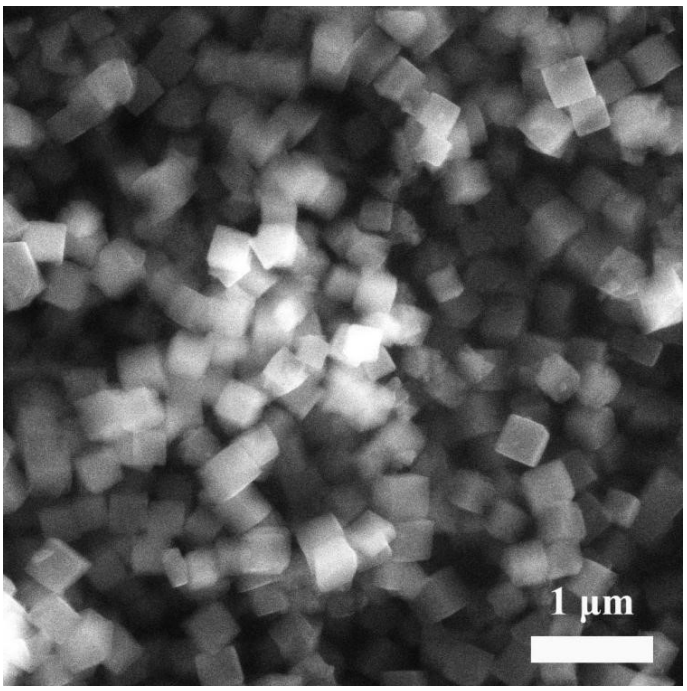

Fig. S4. SEM of ZIF-67.

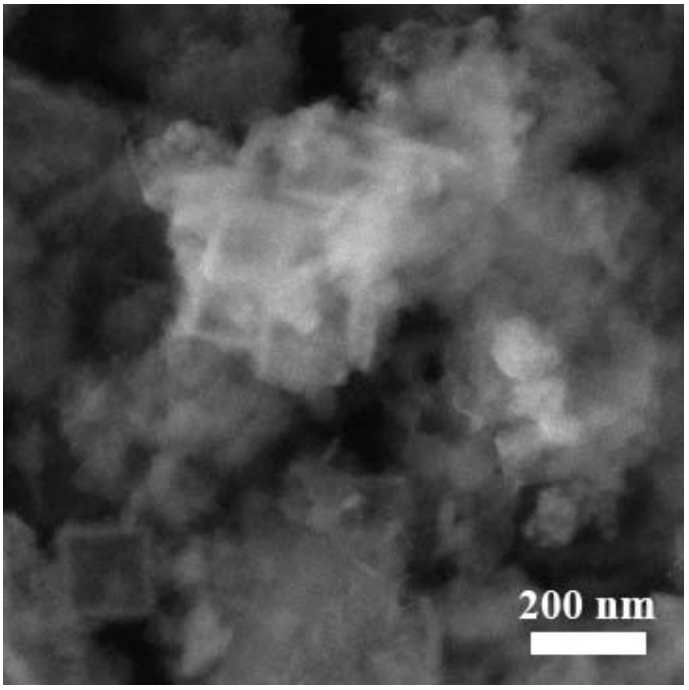

Fig. S5. SEM of CoNi-LDH under magnification.

EIS fitting results

Table. S1. EIS fitting results of CoNi-LDH and CoNiMn-LDH

Material	R_{ct} (Ω)	R_s (Ω)
CoNi-LDH	6.783	0.646
CoNiMn-LDH	4.407	0.598

CV profiles

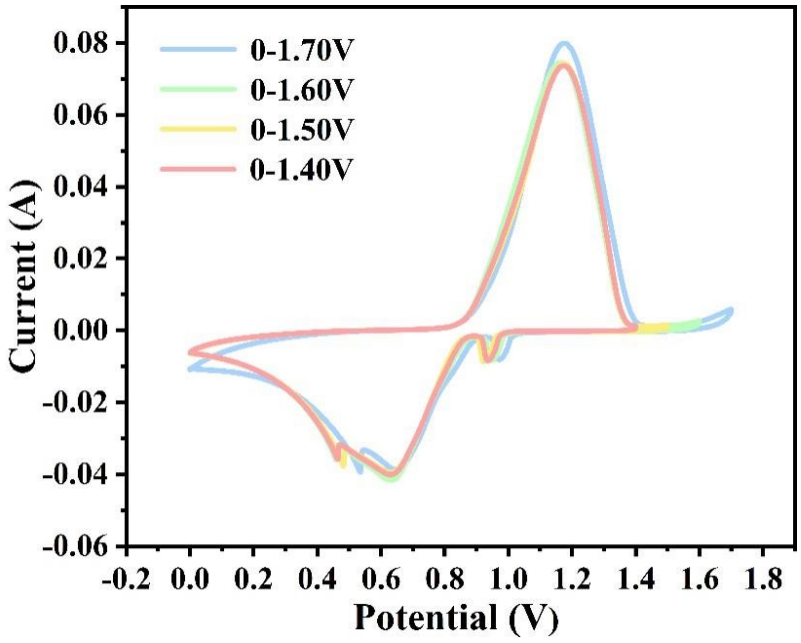

Fig. S6. Voltage window selection of the CoNiMn-LDH//Bi_2O_3 full battery

Nyquist plots

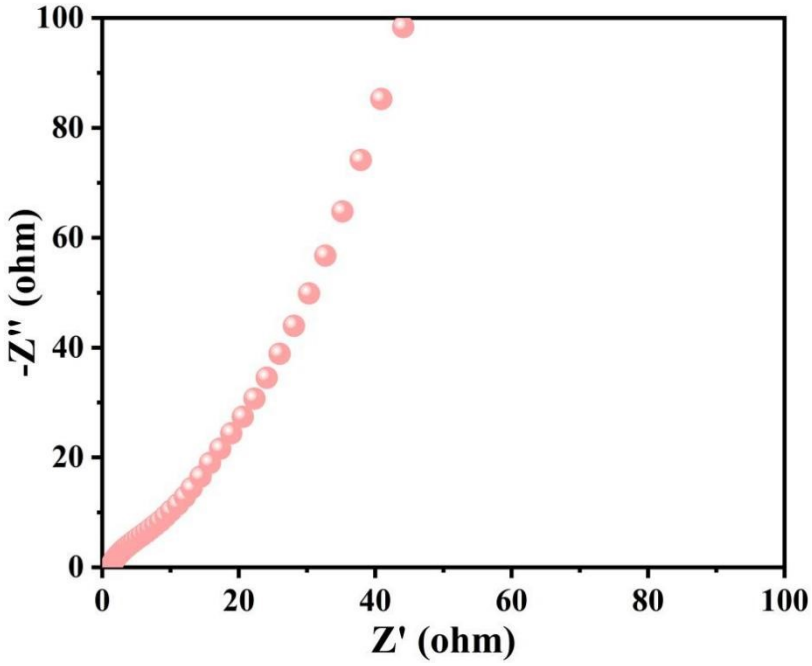

Fig. S7. EIS of the CoNiMn-LDH // Bi_2O_3 full battery.

Ragone Comparison table

Table. S2. Comparison of electrochemical performances of CoNiMn-LDH//Bi_2O_3 in this work with other literature-reported energy storage devices

Electrode materials	Power density (W kg^{-1})	Energy density (Wh kg^{-1})	References
CoNiMn-LDH//Bi_2O_3	4219	120	This work
NiCo-B-S//AC	856	45	[4]
LDH/NG-5//AC	354	31.2	[5]
NiCo-LDH//AC	338	79.6	[6]
NiMn-LDH//AC	1700	46.7	[7]
$NiCo_2S_4$@NC//rGO	4000	30.7	[8]
$NiCSe_2$//HPC	400	34.8	[9]
Ni/$Ni(OH)_2$//AC	530	23.45	[10]
$Ni_xCo_{1-x}(OH)_2$//AC	348.9	21.9	[11]
NiCo-LDH/10//CNT	649	36.1	[12]
NiCoP/NiCo-OH//AC	775	34	[13]
Y-doped $Ni(OH)_2$//AC	754.56	22	[14]

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