Electronic Supplementary Material (ESI) for CrystEngComm.

Supporting Information

A High Performance Asymmetric Supercapacitor Device Based on CoO@CoAl-LDH Hierarchical 3D Nanobouquet Arrays

Yuan Song[1, 2, 3,] Qiang Shen[1, *], Guo-Xiang Pan[1, *], Chao Ye[2], Yi-Fan Zhang[1], Lin Song [3]

[1] Department of Materials Chemistry, Huzhou University, Huzhou 313000, China

[2] Yangtze River Delta Research Institute, Northwestern Polytechnical University, Taicang 215400, China

[3] School of Materials Science and Engineering, Northwestern Polytechnical University, Xi'an 710072, China

*Corresponding authors: Department of Materials Chemistry, Huzhou University, Huzhou 313000, China

E-mail addresses: qiangshen@zjhu.edu.cn (Q. Shen), pgxzjut@163.com (GX. Pan)

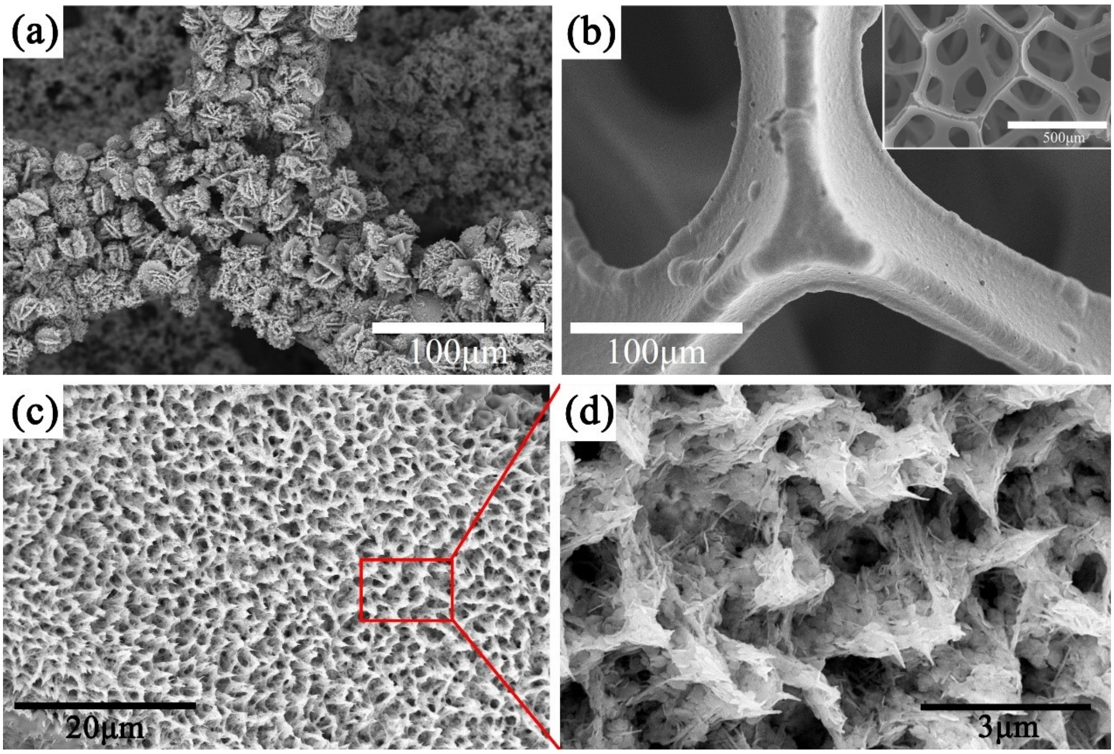

Fig. S1 SEM image of (a)CoO@CoAl-LDH/NF, (b) pure Nickel Foam with an inset of low magnification, CoAl-LDH nanoneedles with low magnification (c) and high magnification (d).

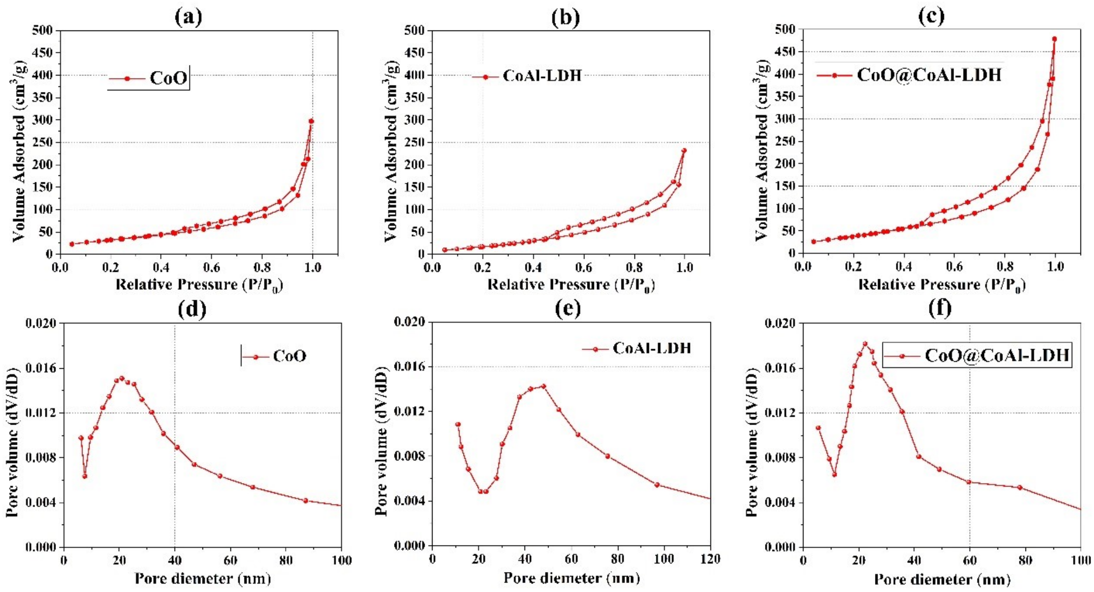

Fig. S2 Nitrogen adsorption desorption isotherms of (a) CoO nanosheets, (b) CoAl-LDH nanoneedles, (c)CoO@ CoAl-LDH nanobouquets, pore size distribution curves of (d) CoO nanosheets, (e) CoAl-LDH nanoneedles, (f) CoO@ CoAl-LDH nanobouquets

Table. S1 Data analysis of nitrogen absorption and desorption

Materials	S_{BET} (m^2 g^{-1})	Average Pore Size (nm)
CoO nanosheets	115.6	28.6
CoAl-LDH nanoneedles	87.3	46.2
CoO@ CoAl-LDH nanobouquets	152.8	32.4

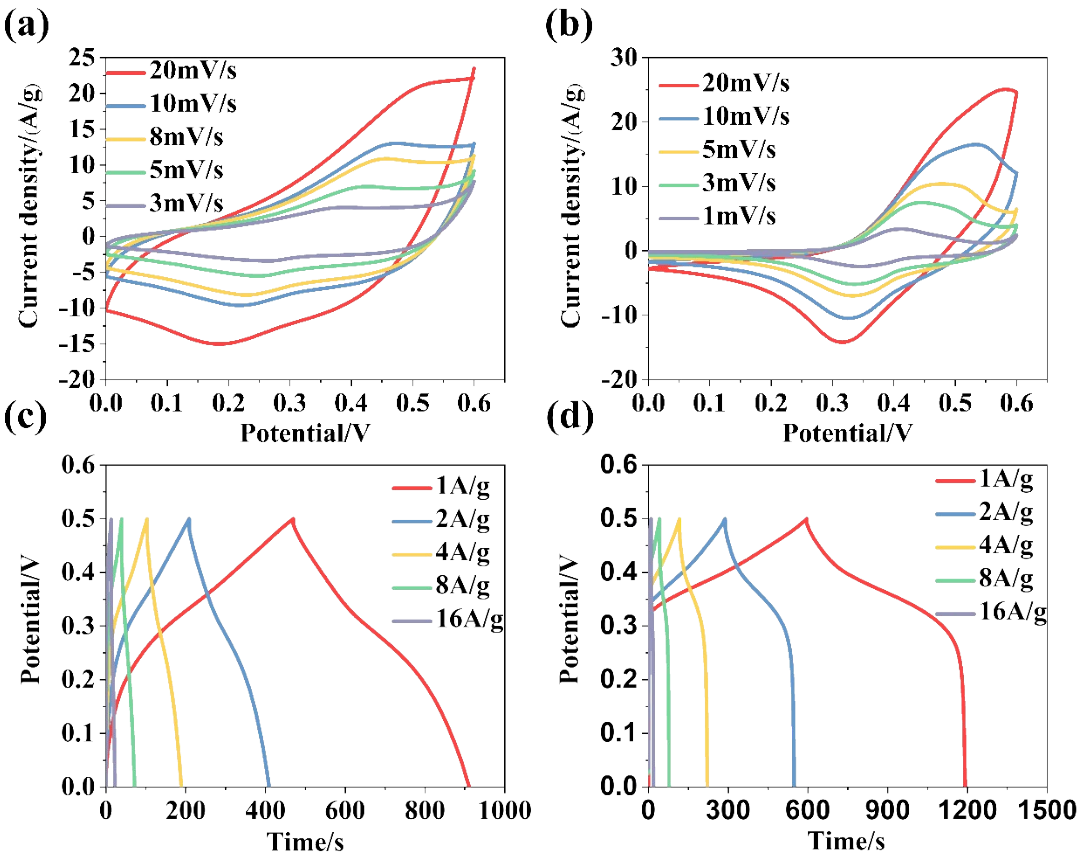

Fig. S3 CV curves of (a) the CoO/NF and (b) the CoAl-LDH/NF at various scan rates; GCD curves of (c) the CoO/NF and (d) the CoAl-LDH/NF at diverse current densities.

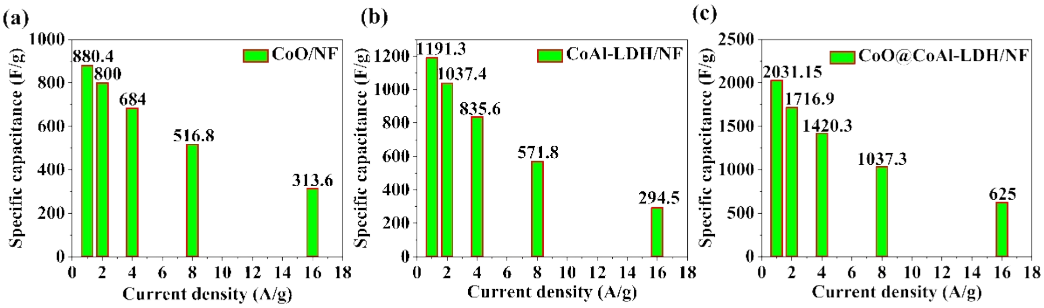

Fig. S4 Rate capability (histogram) at different scan rates of (a) CoO/NF, (b) CoAl-LDH/NF and (c) CoO@CoAl-LDH/NF

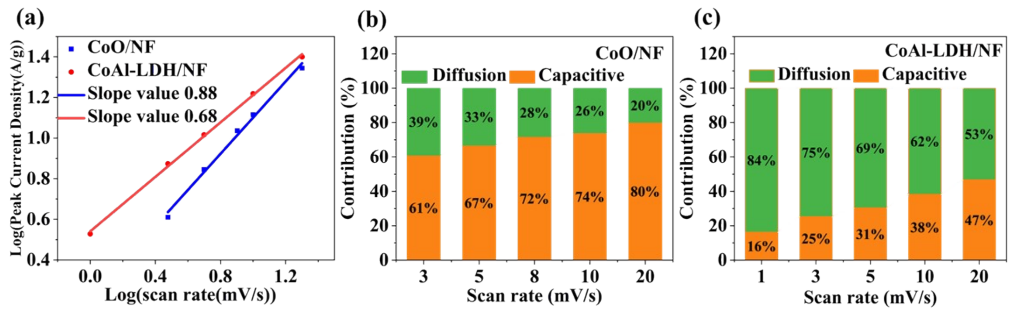

Fig. S5 (a) The value of the slope at different peak currents after linear fitting and pseudo-capacitance contribution rate (histogram) at different scan rates of (b) CoO/NF and (c) CoAl-LDH/NF

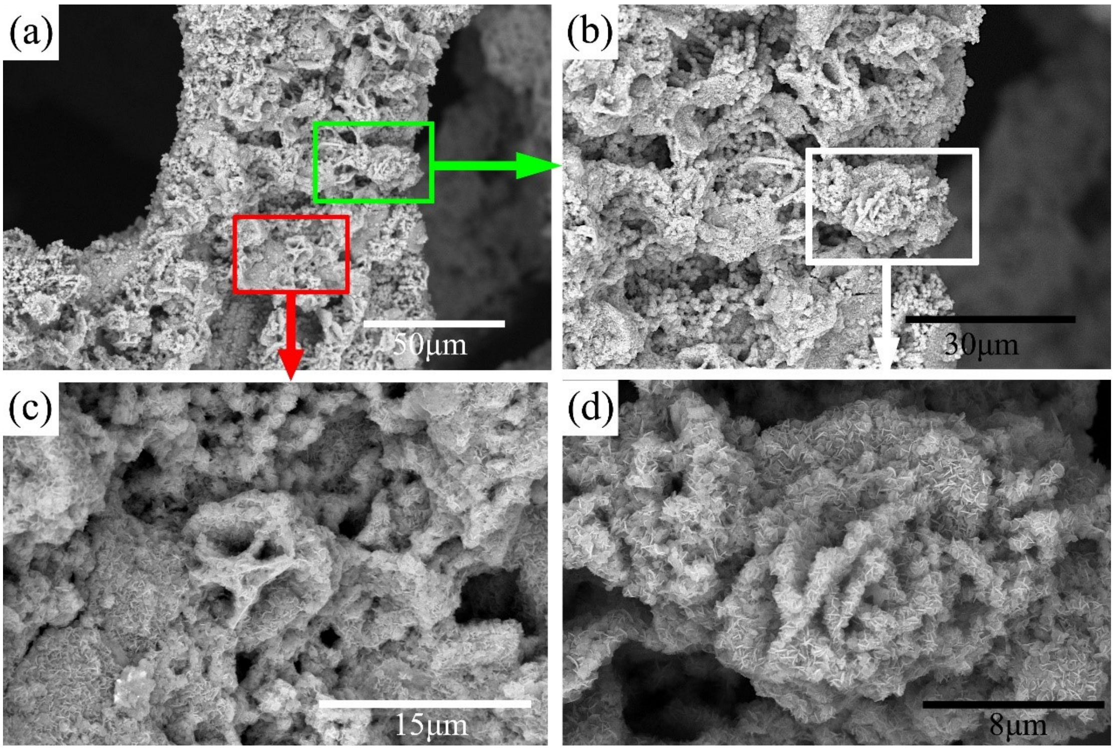

Fig. S6 SEM images of CoO@ CoAl-LDH nanobouquets arrays after 5000 cycles

Table. S2 Comparison of electrochemical properties of similar substance

Electrode materials	Specific capacitance	Cycle stability	Ref
CoAl-LDH/rGO	1492F/g (at 1A/g)	94.3% (after 5000 cycles)	[1]
Co_3O_4@CoAl-LDH	1899.4F/g (at 1A/g)	96.8% (after 5000 cycles)	[2]
Ni_3S_2/CoAl-LDH/rGO	2457.5F/g (at 1A/g)	90.0% (after 5000 cycles)	[3]
NiCo2O4@NiCoAl-LDH	1814.2F/g (at 1A/g)	93.0% (after 2000 cycles)	[4]
O_v-NiCo-LDH	2577.8F/g (at 1A/g)	73.5% (after 5000 cycles)	[5]
$CuCo_2O_4$@MoO_4	1153F/g (at 1A/g)	76.56% (after 5000 cycles)	[6]
α-phase NiCo-LDH	1120F/g (at 1A/g)	93.8% (after 1000 cycles)	[7]

MnO_2@NiCo-LDH	1547F/g (at 1A/g)	82.3% (after 2000 cycles)	[8]
(Ni,Co)Se_2/CC	2.85F/cm^2 (at 2mA/cm^2)	80.8% (after 2000 cycles)	[9]
ZIF-8-C@NiAl-LDH	1370F/g (at 1A/g)	77.0% (after 1000 cycles)	[10]
CoO@CoAl-LDH	2031.2F/g (at 1A/g)	88.2% (after 5000 cycles)	This work

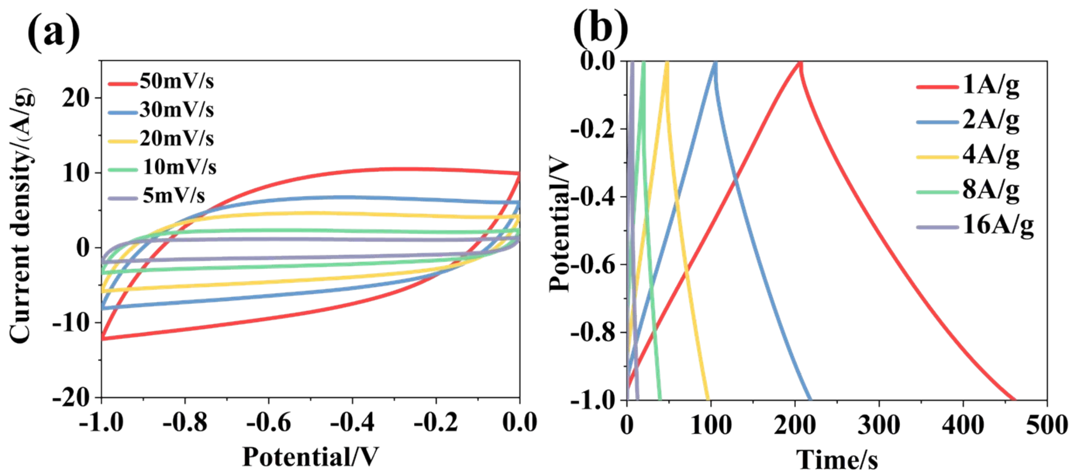

Fig. S7 (a) CV curves of the AC at diverse scan rates; (b) GCD curves of the AC at diverse current densities

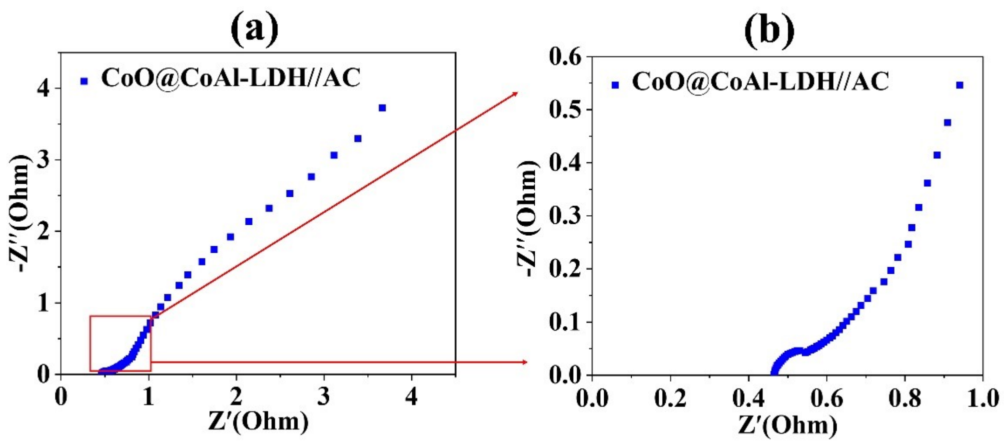

Fig. S8 (a) Nyquist spectra of CoO@CoAl-LDH/NF and (b) enlarged Nyquist spectra of CoO@CoAl-LDH/NF at Z' value range of 0-1.0 ohm.

Reference

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