Supplementary Materials

3D hollow cage copper cobalt sulfide derived from metal–organic frameworks for high-performance asymmetric supercapacitors

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Table. S1 Capacitive parameters of energy density and power density from GCD plot

Potential window (V)	Current (A)	Specific capacitance (F/g)	Discharge time (s)	Energy density (Wh kg^{-1})	Power density (W kg^{-1})
1.62	0.5	240.29	789	87.59	399.65
	0.75	203.28	450	74.10	592.8
	1	194.69	330	70.96	774.11
	2	174.50	145	63.61	1579.28
	5	142.82	48	52.06	3904.50
	8	119.38	26	43.51	6024.46
	10	109.57	19	39.94	7567.58

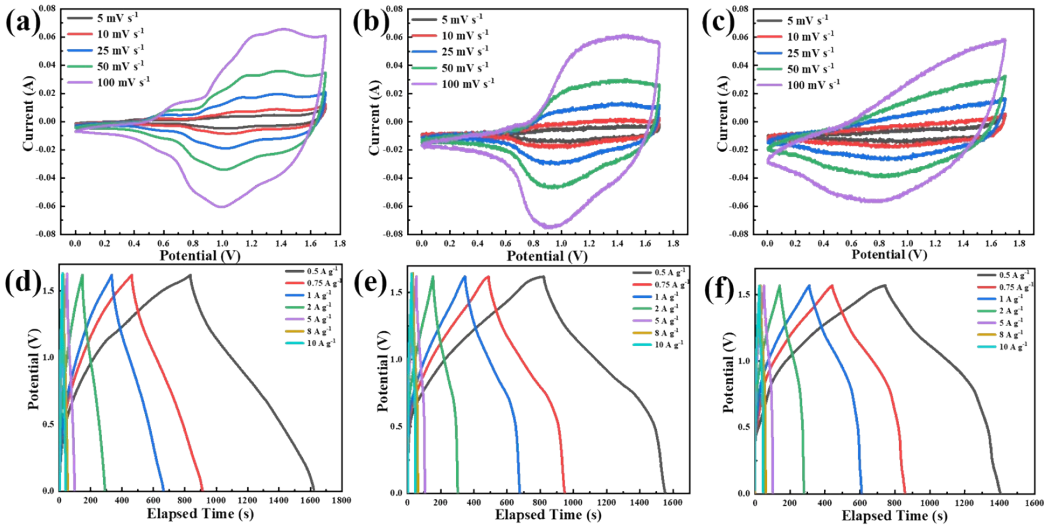

Fig. S1 (a~c) CV curves of ASC device at scan rates from 5 to 100 mV s^{-1} , (d~f) GCD curves of ASC obtained at current densities from 0.5 A g^{-1} to 10A g^{-1}.

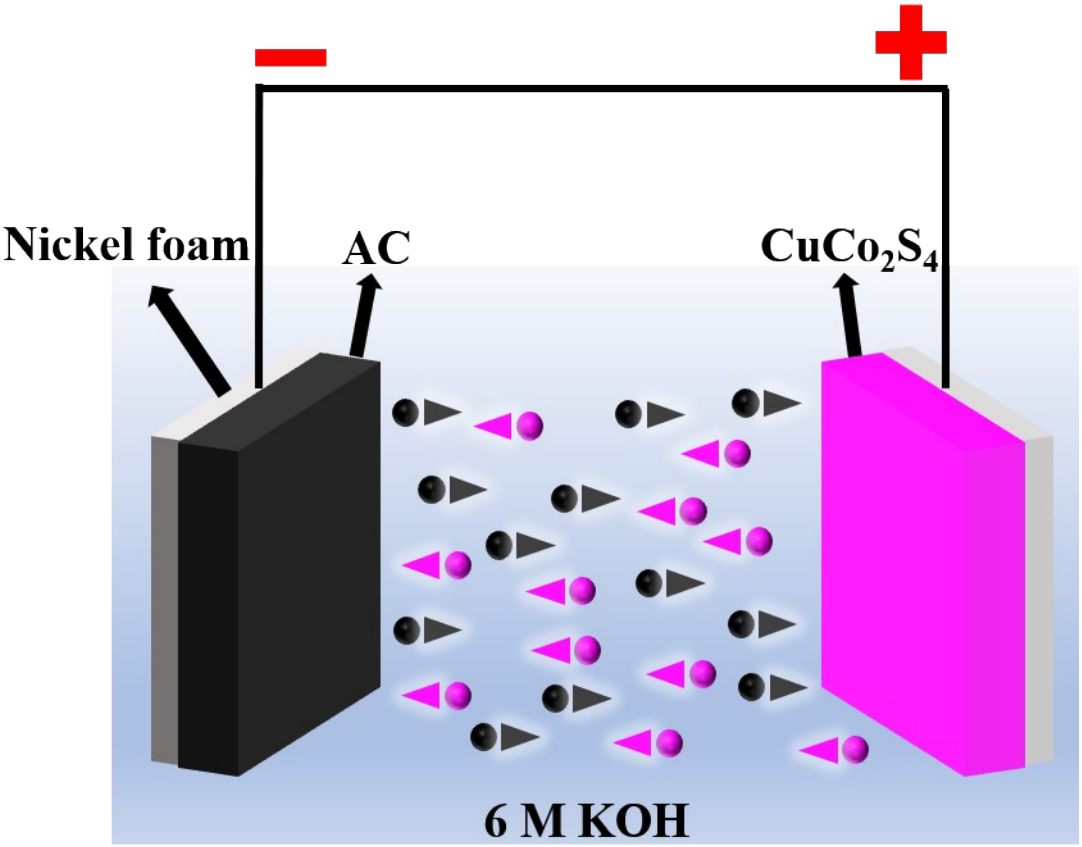

Fig. S2 Model diagram of an assembled asymmetric supercapacitor

Table. S2 Literature study for $CuCo_2S_4$ //AC ASC devices that provide supercapacitive parameters.

Materials	Morphology	Capacitance@GCD	Energy density (W h kg^{-1})	Power density (W kg^{-1})	Stability (%)@ cycle	Refs.
CuS@CQDs	nanoflower	920.5 F g^{-1} @0.5 A g^{-1}	44.19	397.75	92.8% @ 10,000	1
$NiCo_2S_4$	hollow cages	1382 F g^{-1} @1 A g^{-1}	35.3	750	79% @ 10,000	2
Nickel Phosphides	Nanoplate	2293 F g^{-1} @1 A g^{-1}	42.2	741.1	85.7% @ 10,000	3
Cu_2NiSnS_4	Marigold flower	1029 F g^{-1} @0.5 A g^{-1}	41.25	750	59.31% @5,000	4
$NiCo_2O_4$	nanosheets	1734.9 F g^{-1} @2 A g^{-1}	42.25	298.79	87.3% @5,000	5
$CuCo_2S_4$	hollow cages	1096.27 F g^{-1} @0.5A g^{-1}	87.59	399.65	95.83% @5,000	This work

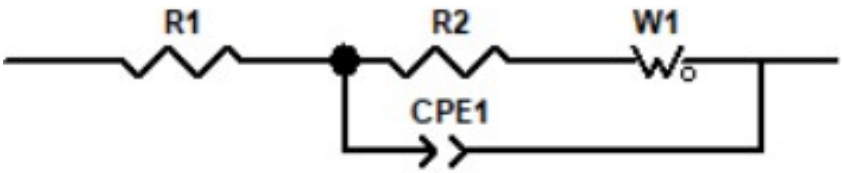

Fig. S3 equivalent circuit diagram of EIS

References

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