Electronic supplementary information (ESI) for

A porous Co(OH)₂ material derived from MOF template and its superior energy storage performances for supercapacitors

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Fig. S1 PXRD patterns of the as-synthesized and simulated Co-BPDC-MOFs.



Fig. S2 (a) SEM image, (b) EDS image of Co-BPDC-MOF.



Fig. 3S (a) CV curves in 6 M KOH electrolyte at different scan rates, (b) galvanostatic charge–discharge (GCD) curves at different current densities, (c) corresponding specific capacitance at current densities from 0.1 to 10 A g⁻¹ of Co(OH)₂ via precipitation method.



Fig. 4S (a) CV curves in 6 M KOH electrolyte at different scan rates, (b) galvanostatic charge–discharge (GCD) curves at different current densities, (c) corresponding specific capacitance at current densities from 0.1 to 10 A g⁻¹ of Co(OH)₂ obtained via a mixture of Co(NO₃)₂•6H₂O and Na₂(bpdc) in place of Co-BPDC-MOF as precursor.

Table 1

Method	Capacita	Ref.			
	1 A g ⁻¹	2 A g ⁻¹	5 A g ⁻¹	10 A g ⁻¹	
Facile precipitation method	429	405	369	337	32
Soft template method	325 (1.33A/g)		279 (5.33A/g)		25
	166.7 351	344	334	325	24 33
MOF template method	531.8	496.1	454.6	430.9	This work

Comparison of the Co(OH)₂ materials via different methods.

Table 2

The specific capacitance, energy density and power density of MOFderived $Co(OH)_2//AC$ asymmetric supercapacitor at different charge/discharge current densities (corresponding to Fig. 4c).

Discharge current (A g ⁻¹)	0.2	0.5	1	2	5
Capacitance (F g ⁻¹)	49.8	45.5	41.6	39.7	35.4
Energy density (Wh kg ⁻¹)	13.6	12.4	11.3	10.8	9.6
Power density (W kg ⁻¹)	140	350	700	1400	3500



Fig. S5 (a), (b) and (c) TEM images (d) HRTEM image of the MOFderived $Co(OH)_2$ materials obtained after 2000 cycles.



Fig. S6 Nyquist plot of EIS data of the MOF-derived $Co(OH)_2$ electrode. (The inset is equivalent Randles circuit. R_S , Cd, R_{ct} and W represent the bulk solution resistance, constant phase element, charge transfer resistance and Warburg element, respectively. The impedance data is simulated with ZSimpWin software, the deviation of each component is less than 5%.)