Electronic Supplementary Information (ESI)

Carbon nanotube-regulated growth of metal–organic framework nanosheets for enhanced electrochemical energy storage

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Supplement Figures:

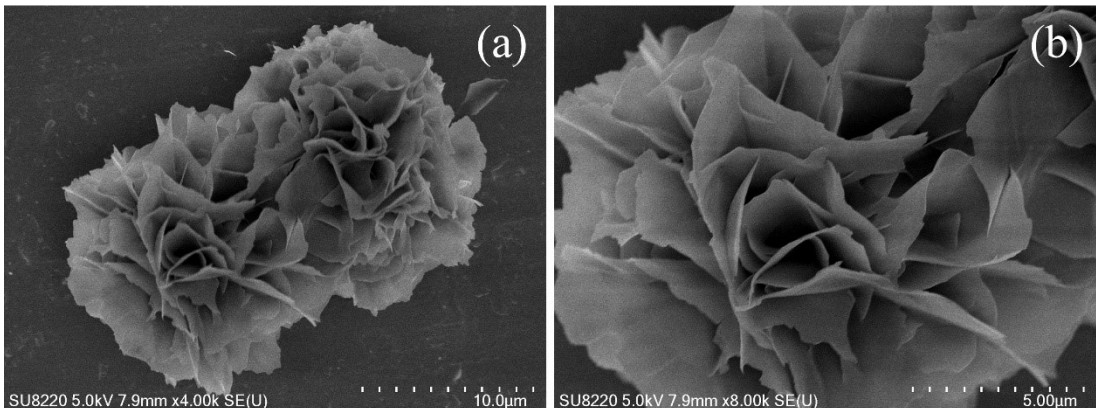

Fig. S1 SEM images of Ni-Tdc.

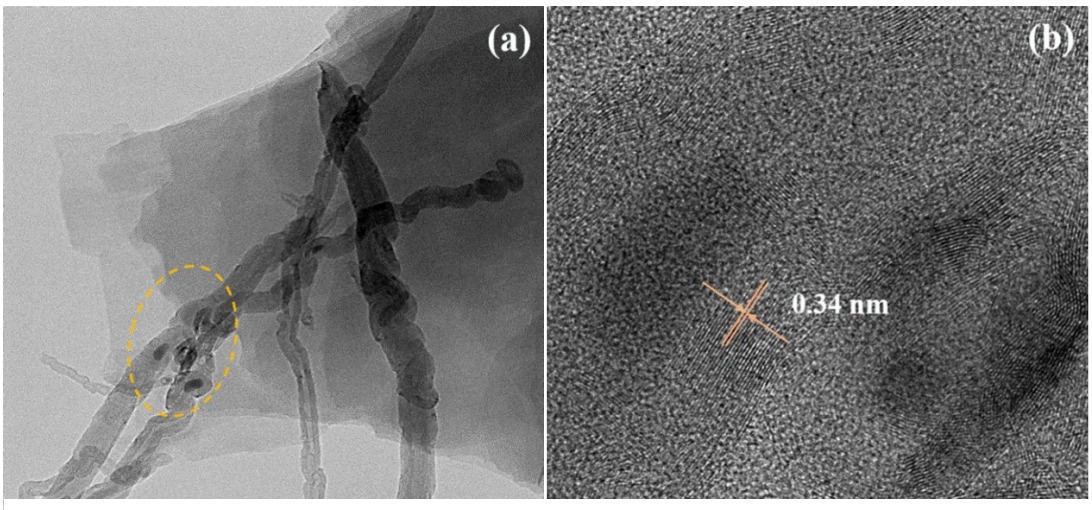

Fig. S2 TEM images of Ni-Tdc/CNTs-20 under different magnification.

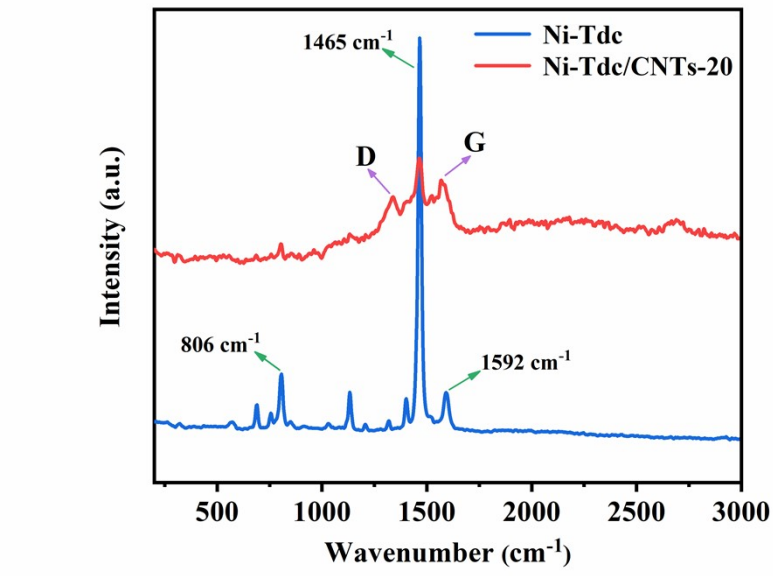

Fig. S3 Raman spectra of Ni-Tdc and Ni-Tdc/CNTs-20.

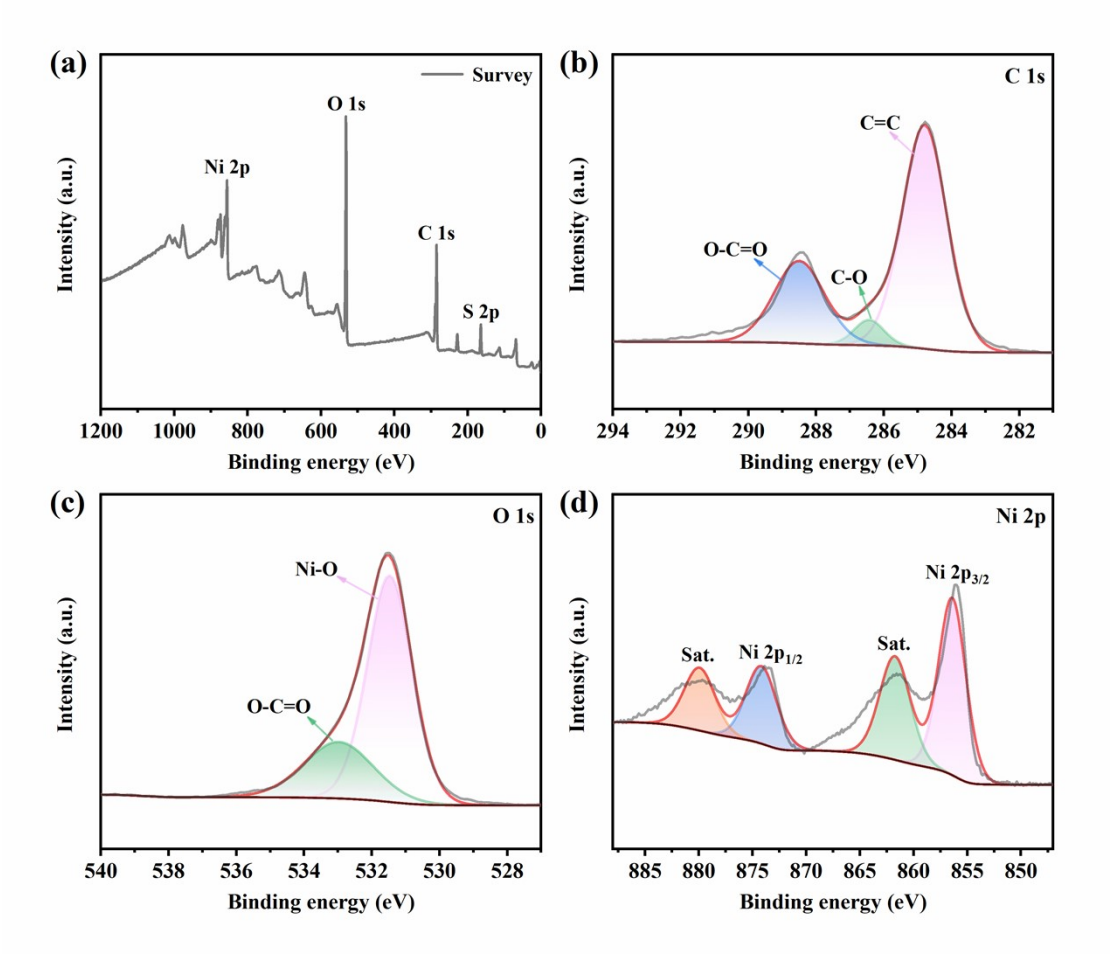

Fig. S4 XPS spectra of Ni-Tdc: (a) survey spectrum; (b) C 1s; (c) O 1s; (d) Ni 2p.

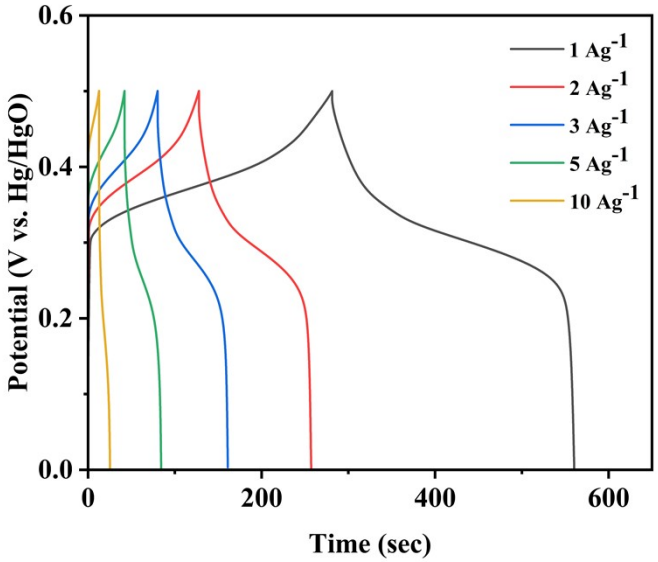

Fig. S5 GCD curves of Ni-Tdc electrode at different current densities.

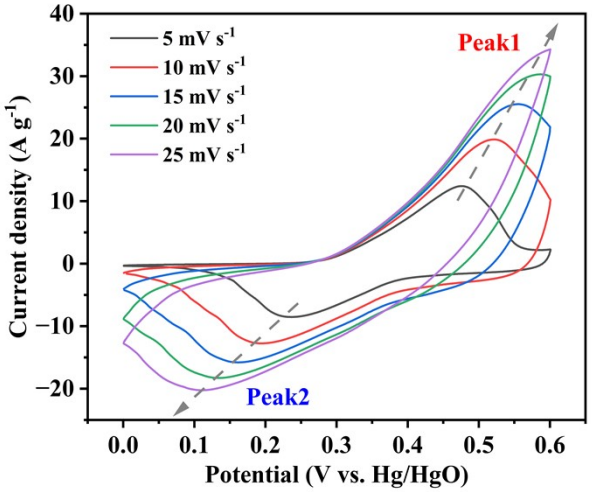

Fig. S6 CV curves of Ni-Tdc/CNTs-20 at different scan rates.

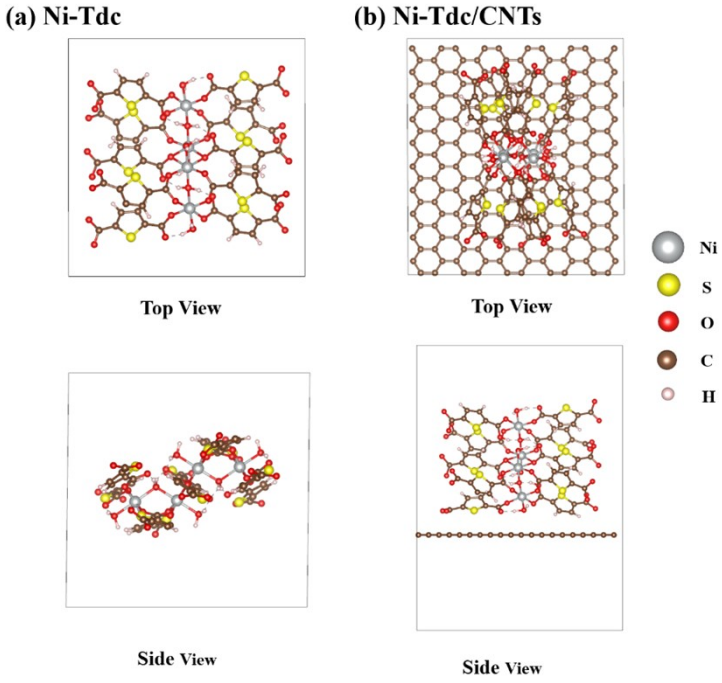

Fig. S7 Optimized crystal structural models of Ni-Tdc and Ni-Tdc/CNTs.

Supplement table:

Table. S1 Porosity properties of the Ni-Tdc_and Ni-Tdc/CNTs-20 samples.

Samples	BET Surface Area	t-Plot micropore volume	Adsorption average pore diameter (4V/A by BET)
Ni-Tdc	16.4178 m^2/g	0.000729 cm^3/g	12.49309 nm
Ni-Tdc/CNTs-20	35.2797 m^2/g	0.004838 cm^3/g	19.74872 nm

Table. S2 The mass loadings of active materials for various electrodes.

Electrode Samples	Ni-Tdc	Ni-Tdc/CNTs-10	Ni-Tdc/CNTs-20	Ni-Tdc/CNTs-30	Ni-Tdc/CNTs-40	AC as the negative electrode
Active Materials	1.79mg	2.81mg	1.89mg	3.01mg	1.99mg	12mg

Table. S3 Comparison of energy storage performance of Ni-Tdc/CNTs-20 and various MOFs-based electrodes.

Electrodes	Synthesis method	Electrolyte	Specific capacitance/Specific capacity	Energy density (Wh kg^{-1})	Power density (W kg^{-1})	Cycling stability (%)/Cycles	Magnification performance	Ref
Cu-MOF/rGO	Ultrasonication mixing method	1 M $NaNO_3$	385 F g^{-1} at 1 A g^{-1}	42	3100	98.5, 4000	94.8 % (4 A g^{-1})	1
Mn/Ni-MOF@MWCNTs	One-step solvothermal method	1 M LiOH	793.6 F g^{-1} at 1 A g^{-1}	33.2	1198	78.3, 2000	51.9 % (20 A g^{-1})	2
Co-MOF/PANI	*In-situ* chemical oxidative polymerization method	1 M KOH	502 F g^{-1} at 1 A g^{-1}	/	/	90, 5000 (Specific Capacitance)	23.2 % (5 A g^{-1})	3
Ni/Mn-MOF	Solvothermal method	6 M KOH	531.5 F g^{-1} at 0.5 A g^{-1}	/	/	67.7, 2300	59.8 % (5 A g^{-1})	4
NiBpy-py	One-pot solvothermal method	3 M KOH	222.5 F g^{-1} at 0.5 A g^{-1}	52.3	1118.7	75, 1000 (Specific Capacitance)	42.7 % (5 A g^{-1})	5
Ni/Co-MOF-rGO	One-pot co-synthesis method	6 M KOH	860 F g^{-1} at 1 A g^{-1}	72.8 15.1	850 4250 0	91.6, 6000	/	6
RGO-Au-Ag2O/PIn	Two-step procedure method	1 M Na_2SO_4	212.50 F g^{-1} at 2A g^{-1}	40	1000	82, 12000	/	7

Ni-Tdc/CNTs-20	Solvothermal method	1 M KOH	757.8 F g^{-1} at 1 A g^{-1}	45 22.2	798 8000	74.1, 5000	79.4 % (10 A g^{-1})	This work

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