Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Highly flexible and free-standing carbon nanotube/hollow carbon nanocage hybrid films for high-performance supercapacitors

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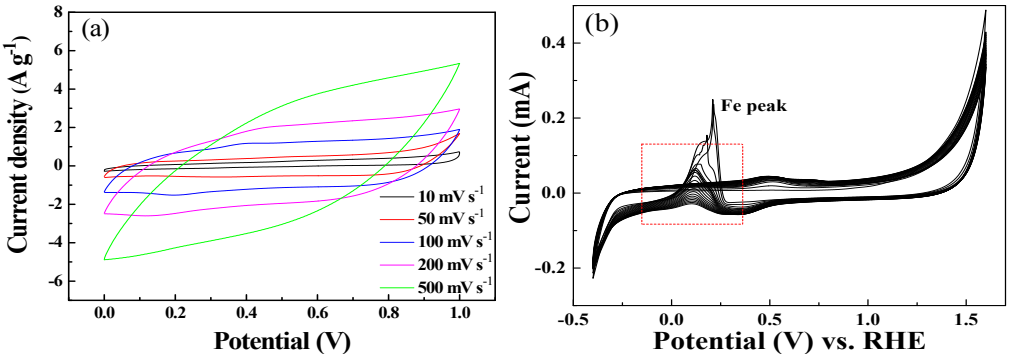

Fig. S1. (a) CV curves of the origin CNT film. (b) CV curves from purification process.

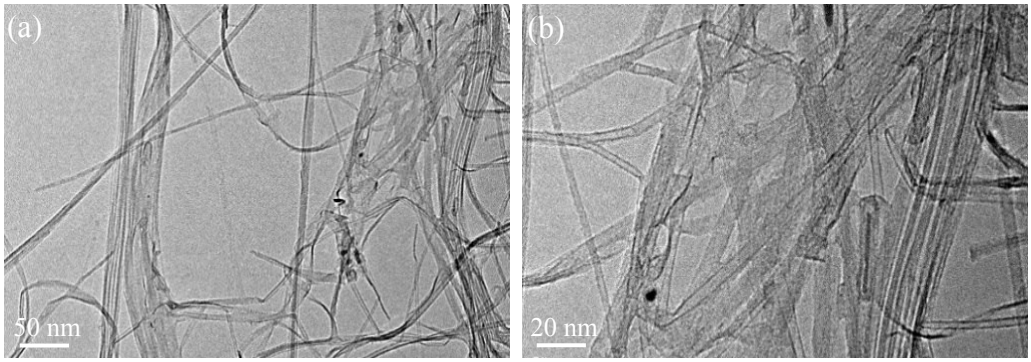

Fig. S2. TEM images of the purified CNTs at different magnifications

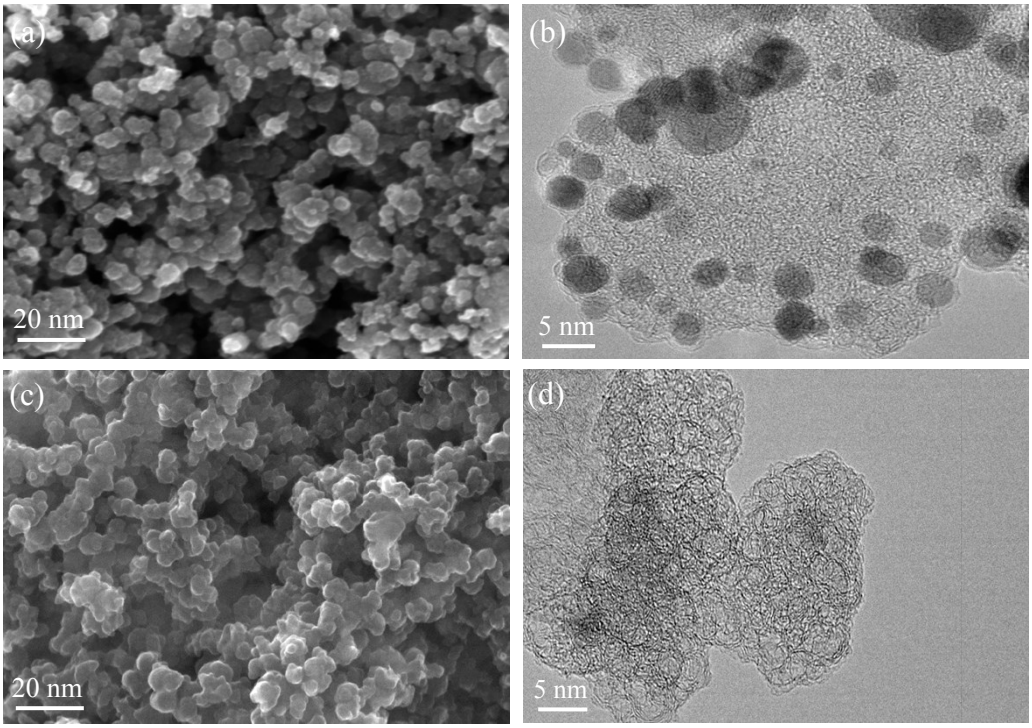

Fig. S3. SEM images of (a) CNC, (c) HCNC; TEM images of (b) CNC, (d) HCNC

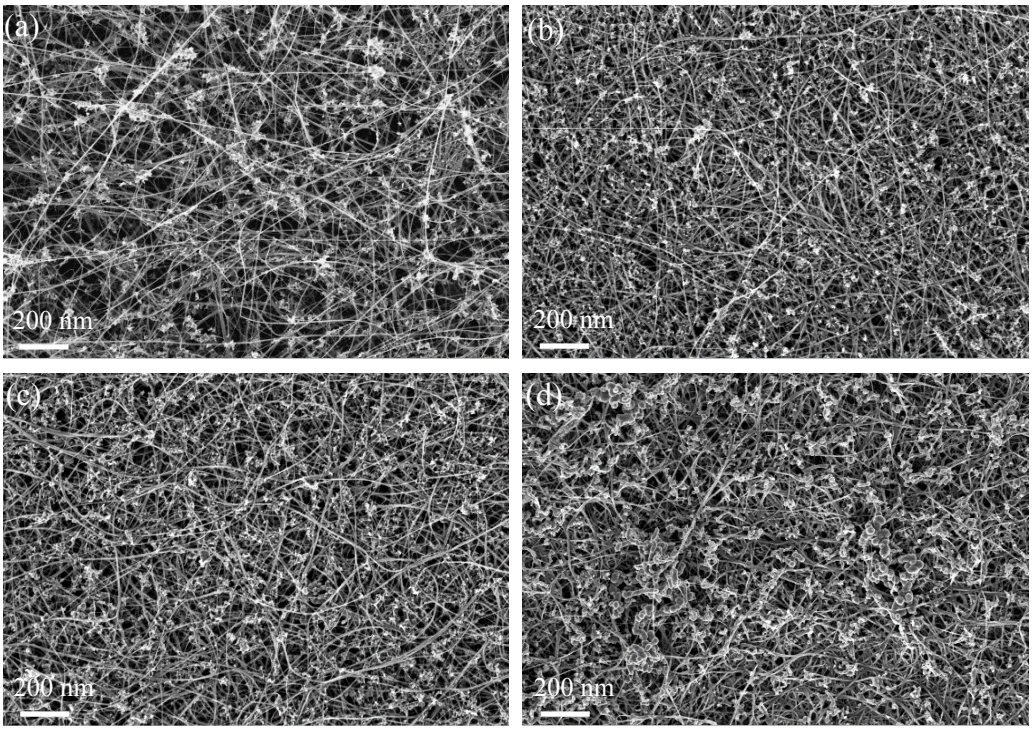

Fig. S4. SEM images of PCNT/HCNC hybrid films. (a) PCNT-HCNC-0.6; (b) PCNT-HCNC-0.8 (c) PCNT-HCNC-1.0; (d) PCNT-HCNC-1.2.

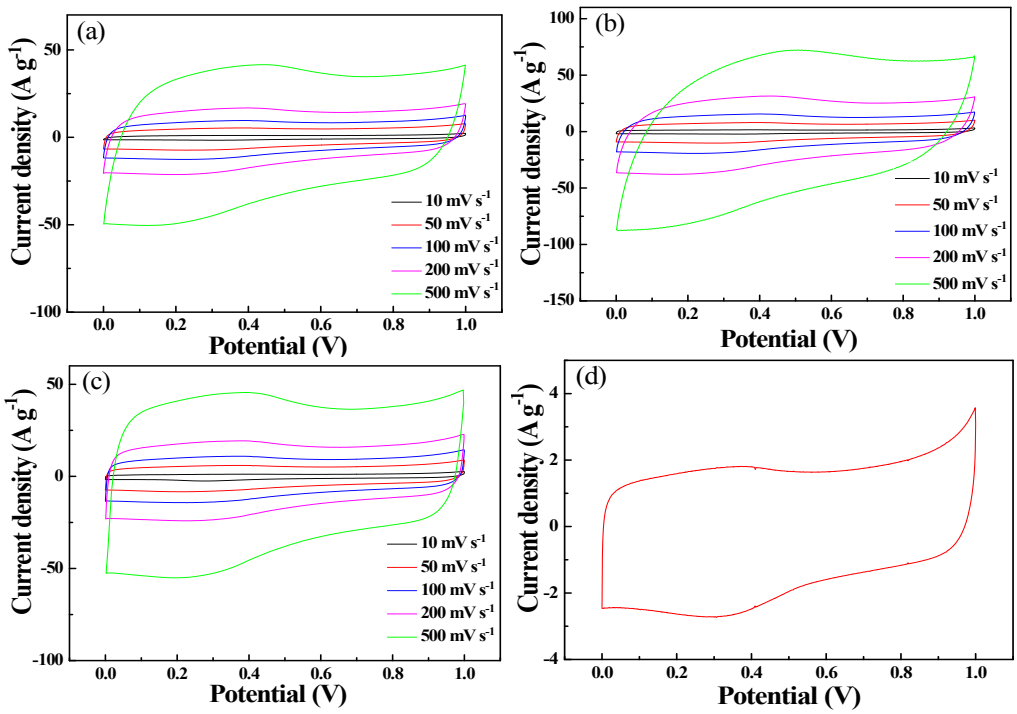

Fig. S5. (a) CV curves of the PCNT-HCNC-0.6 film at different scan rates. (b) CV curves of the PCNT-HCNC-0.8 film at different scan rates. (c) CV curves of the PCNT-HCNC-1.2 film at different scan rates. (d) CV curves of the PCNT-HCNC-1.0 film at 10 mV s^{-1}.

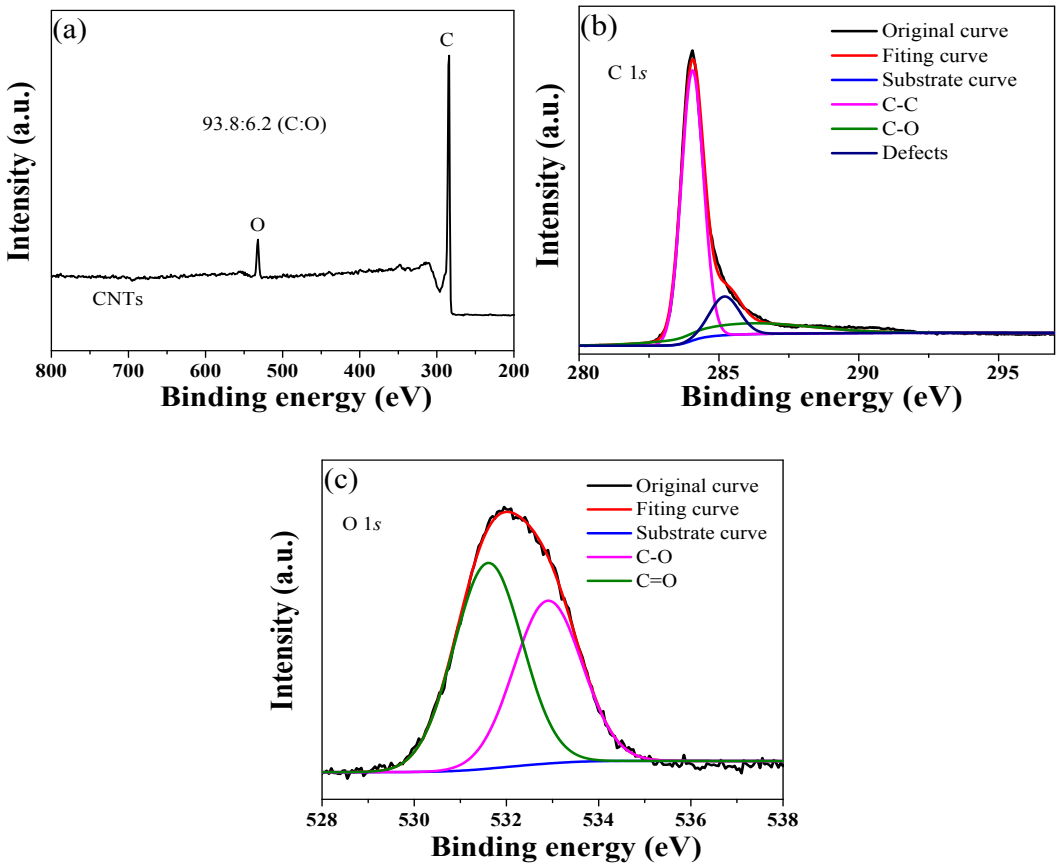

Fig. S6. (a) XPS, (b) carbon 1s and (c) oxygen 1s spectra of the PCNT-HCNC-1.0 hybrid film

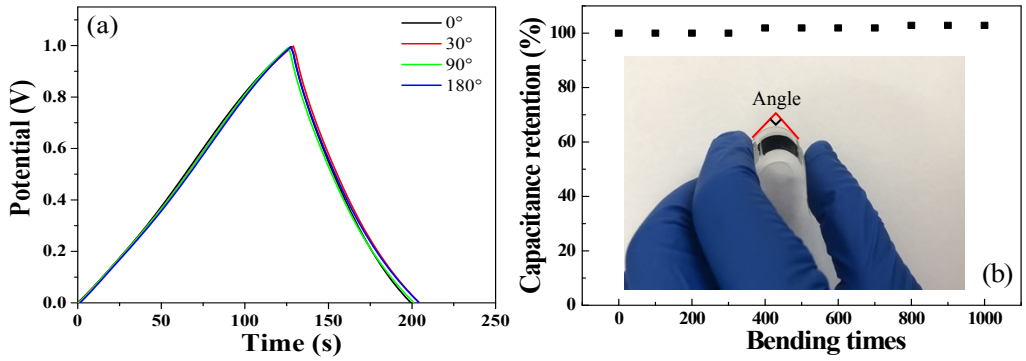

Fig. S7. (a) GCD curves of the PCNT-HCNC film bent at different angles. (b) Cycle life of the PCNT-HCNC measured at a current density of 2 A g^{-1}. The inset is the film bent at an angle of 90°.

Table S1. Specific surface areas of different PCNT-HCNC hybrid films

Samples	Specific surface area (m^2 g^{-1})
PCNT-HCNC-0.6	403.2865
PCNT-HCNC-0.8	521.1387
PCNT-HCNC-1.0	686.3172
PCNT-HCNC-1.2	467.5671

Table S2. The Results of areal capacitance from previous studies and the present measurement

Electrode material	Test condition	Areal capacitance (mF cm^{-2})	Ref.
Purified CNT-HCNC	10 mV s^{-1}	16.5	This work
Graphene sheets coated graphene fibers	17 μA cm^{-2}	1.2	1
Reduced graphene oxide on Au wires	50 mV s^{-1}	6.49	2
Graphene film	20 mV s^{-1}	<3	3
Printed SWNT film	1 A g^{-1}	<0.25	4
Graphene/Carbon black paper	10 mV s^{-1}	<30	5
Cellular graphene film	1 A g^{-1}	56.8	6
Graphite/MWNT hybrid paper	1 V s^{-1}	13	7
mesoporous carbon/CNT film	1 mA cm^{-2}	1	8

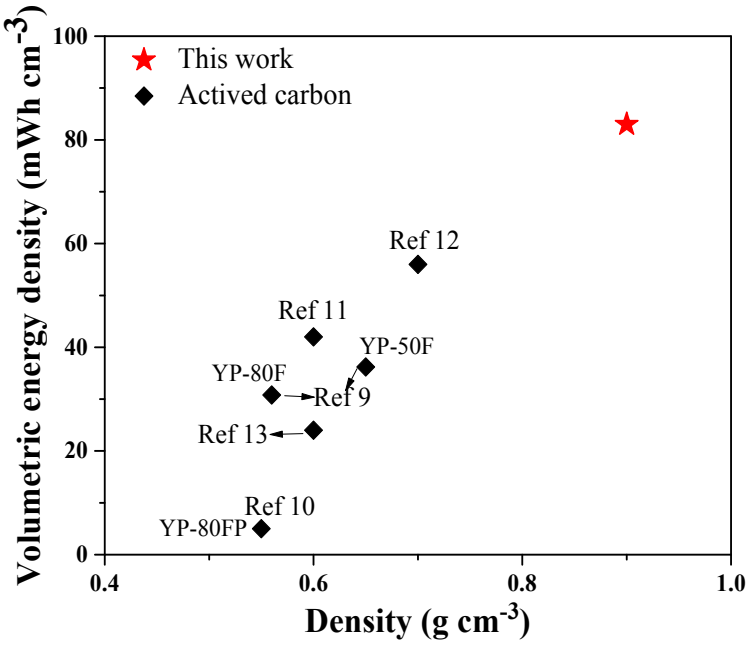

Fig. S8. Comparisons of volumetric energy density between the present sample and previous activated carbon.

References

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