

## Supporting Information

### Upcycling Waste PET to Oxygen-Rich Carbon Nanotubes for High-performance Supercapacitor with Ultra-high Cycling Stability

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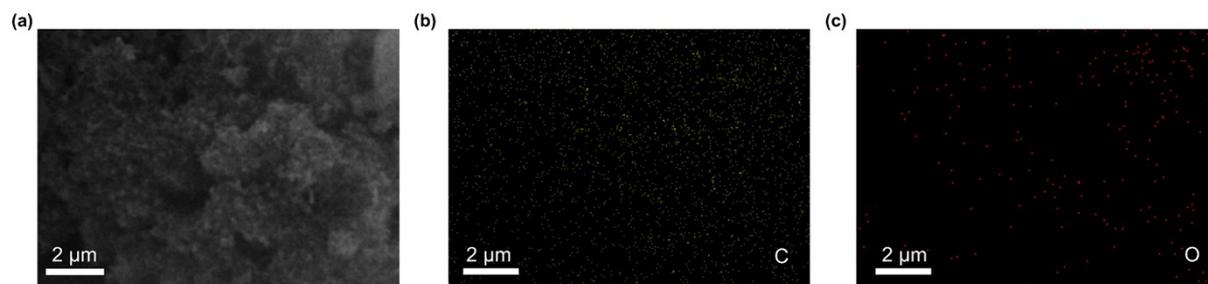
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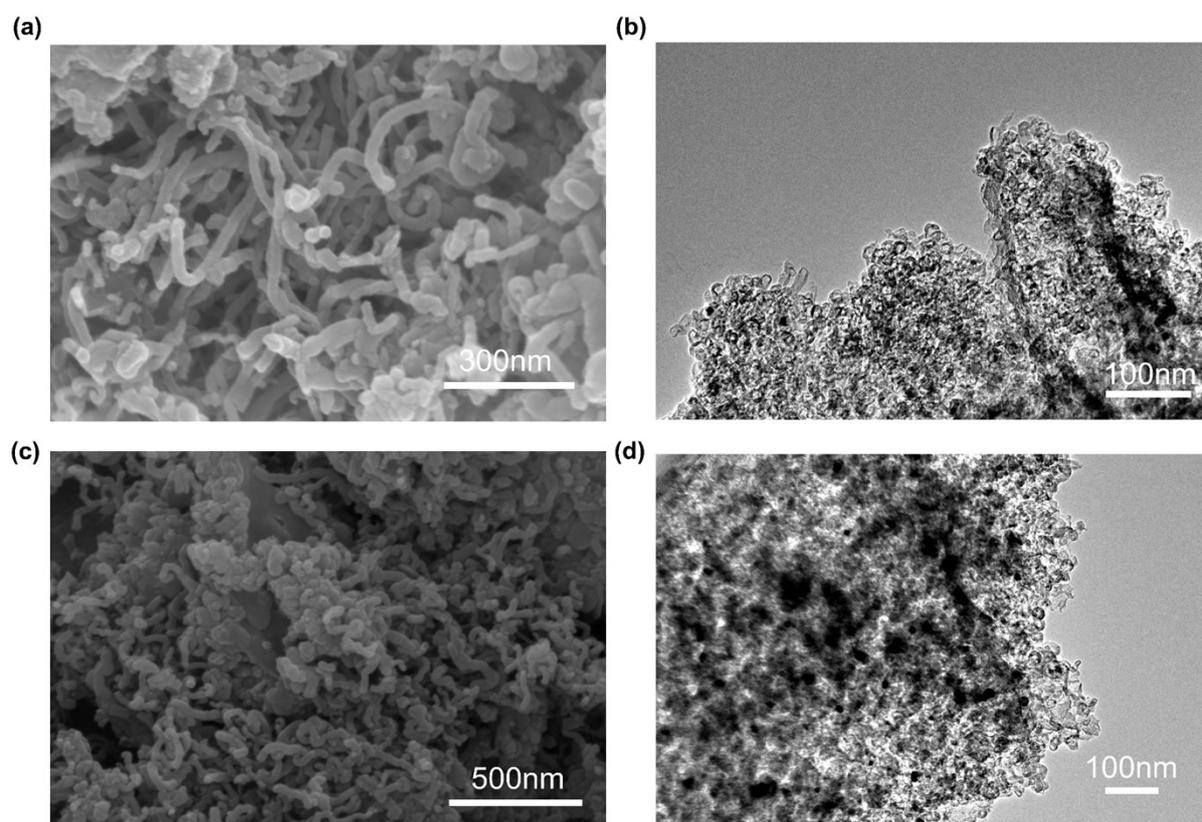
**Contents:**

**Figs. S1-S5**

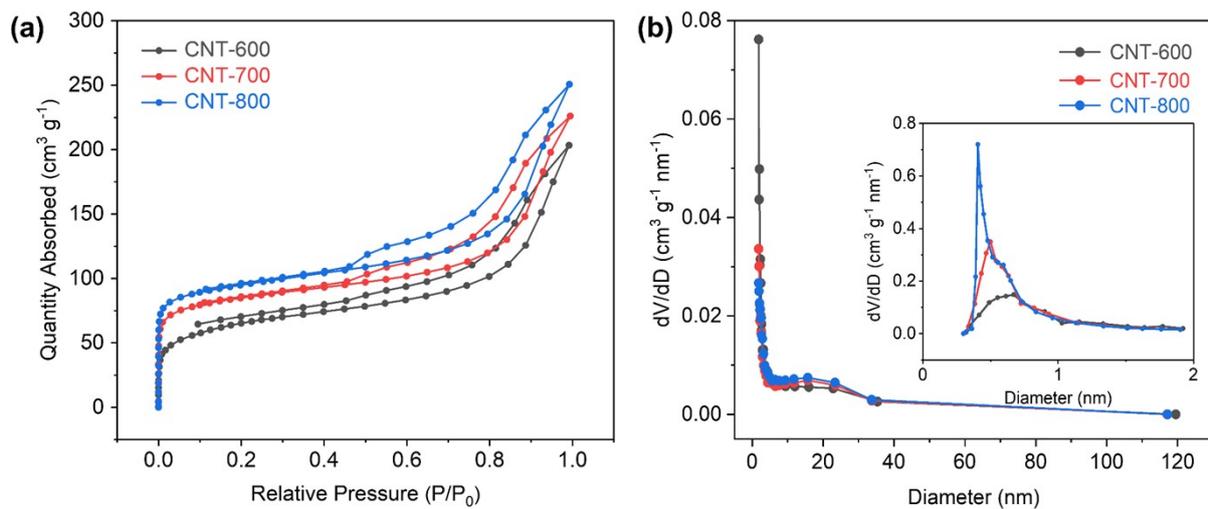
**Table S1-S3**



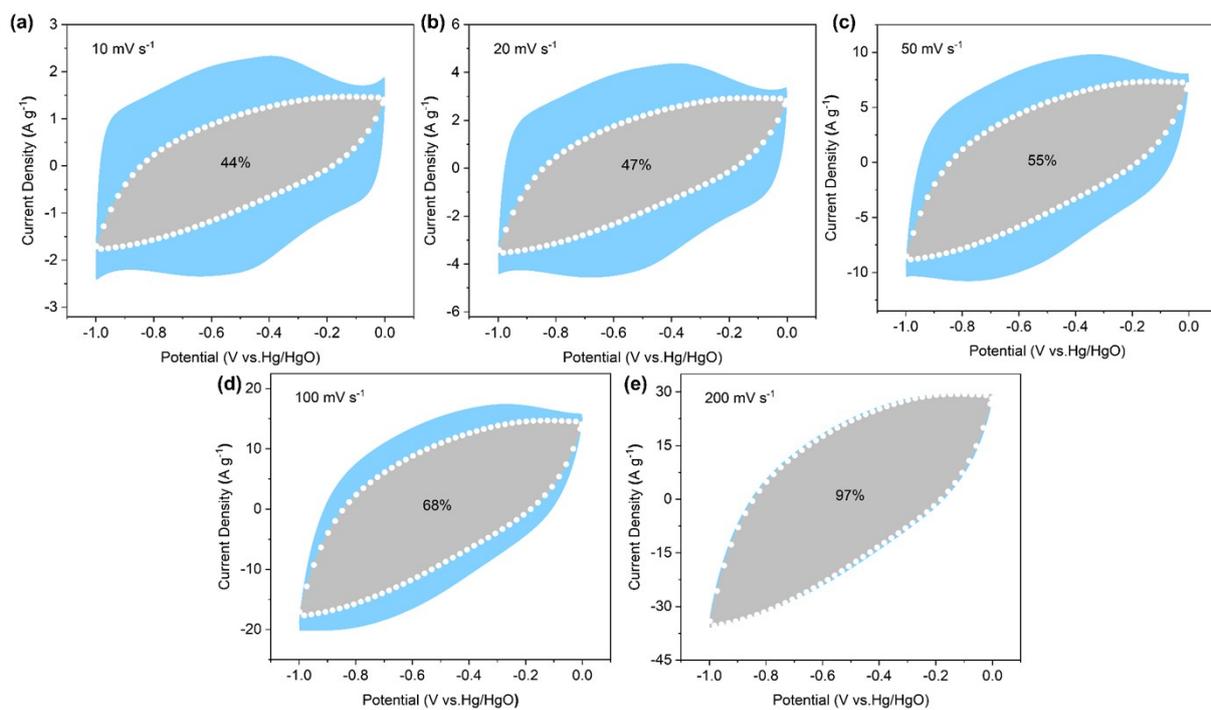
**Fig. S1.** (a-c) EDS mapping of CNT-700.



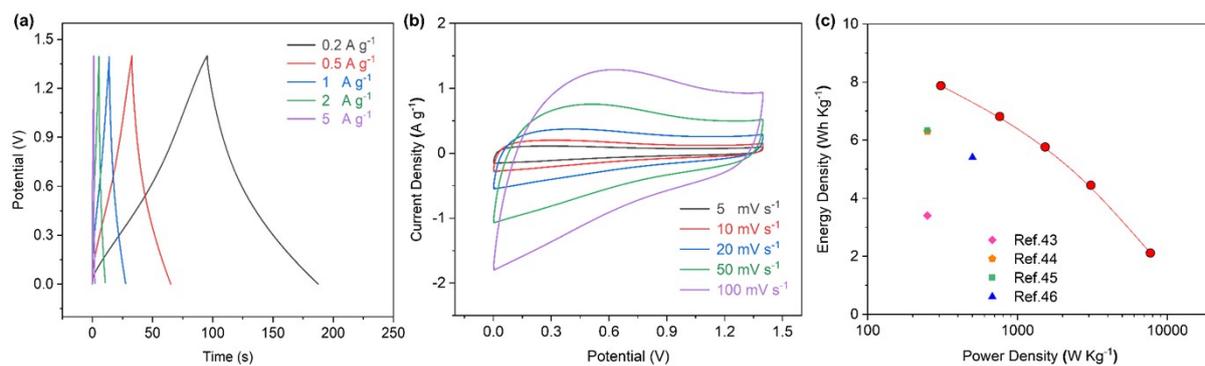
**Fig. S2.** (a) SEM images and (b) TEM images of CNT-600. (c) SEM images and (d) TEM images of CNT-800.



**Fig. S3.** (a)  $N_2$  adsorption-desorption isotherms of CNT-600, CNT-700 and CNT-800. (b) Pore size distributions of CNT-600, CNT-700 and CNT-800.



**Fig. S4.** The contributions of EDLC and PC of CNT-700 at various scan rates.



**Fig. S5.** (a) GCD curves at different current densities. (b) CV curves at various scanning rates. (c) Nyquist plots.

**Table S1.** Summary of the results of the fitting of the C 1s and O 1s high-resolution XPS spectra of CNT -700.

C 1s		O 1s	
C=C	53.59 at.%	C-OH	42.88 at.%
C-O	34.78 at.%	O=C	51.22 at.%
O=C	11.63 at.%	Chemisorbed O	5.90 at.%

**Table S2.** Specific surface area and pore structure parameters of the samples.

Sample	$S_{\text{BET}}$ ( $\text{m}^2 \text{g}^{-1}$ )	$V_t$ ( $\text{cm}^3 \text{g}^{-1}$ )	$D_{\text{ave}}$ (nm)
CNT-600	235.67	0.3124	5.3024
CNT-700	315.16	0.3452	4.3813
CNT-800	354.86	0.3848	4.3375

**Table S3.** Summary of the fitting results for  $R_s$  and  $R_{\text{ct}}$  of CNT at different temperatures.

Sample	$R_s(\Omega)$	$R_{\text{ct}}(\Omega)$
CNT-600	0.44	0.29
CNT-700	0.42	0.20
CNT-800	0.38	0.14