Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

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Surfactant-free synthesis of nanoperforated graphene/nitrogen-doped carbon nanotube composite for supercapacitors

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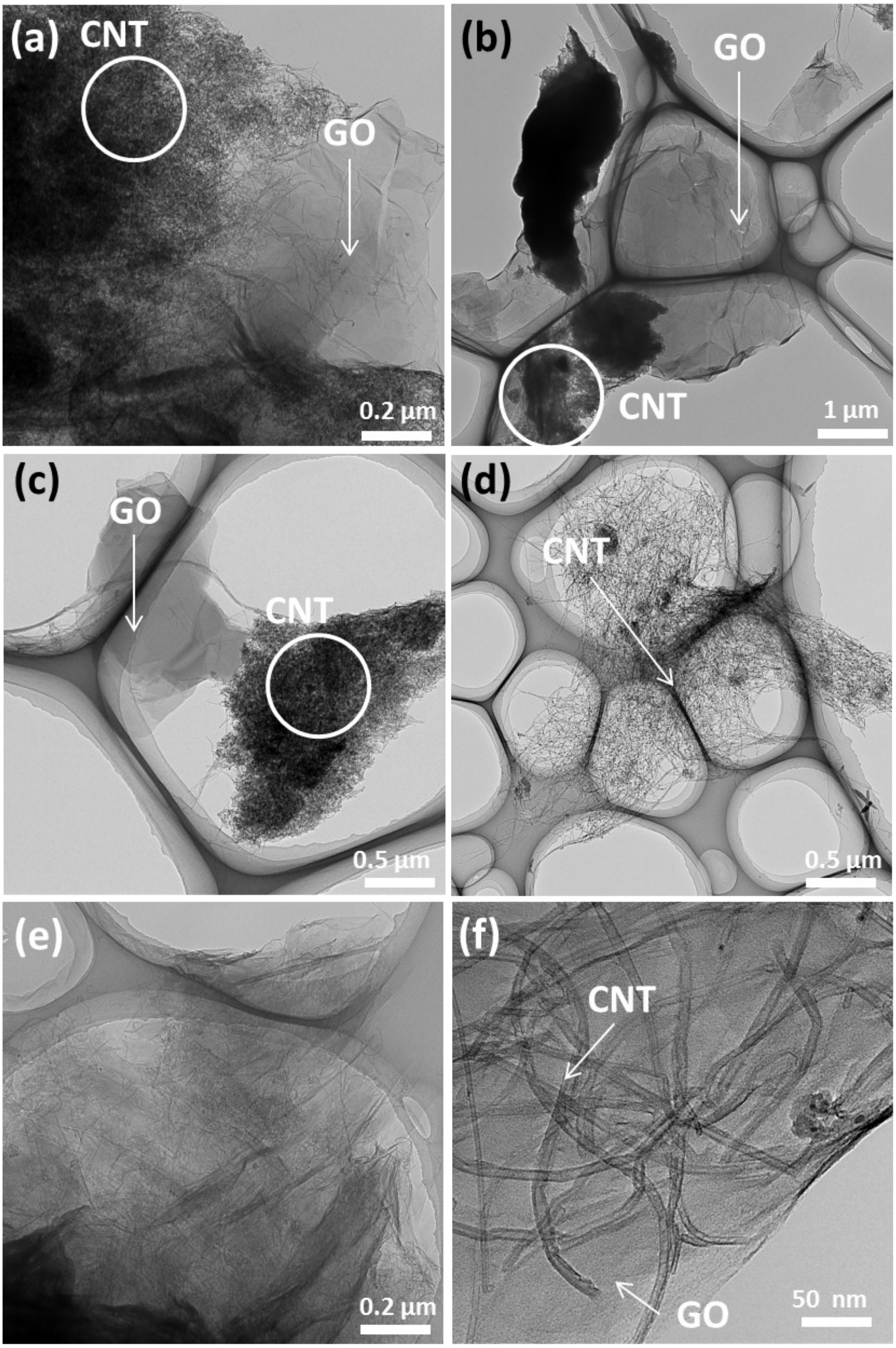

Fig. S1 (a,b) TEM images of GO/pristine CNT, (c,d) GO/ACNT, and (e,f) GO/N-CNT.

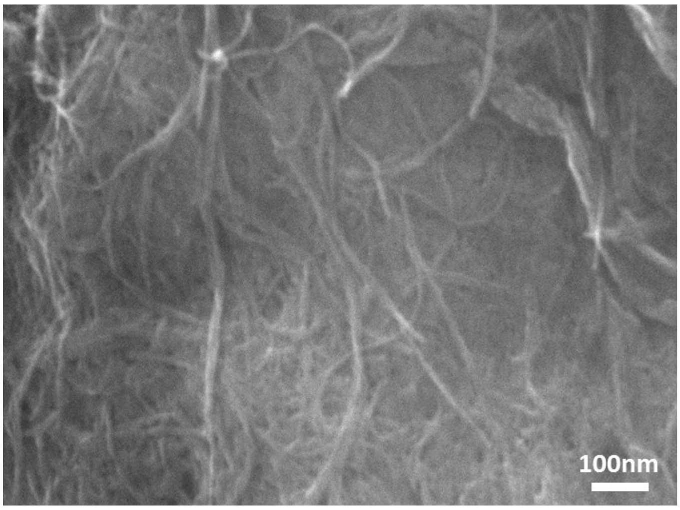

Fig. S2 SEM image of PG/N-CNT.

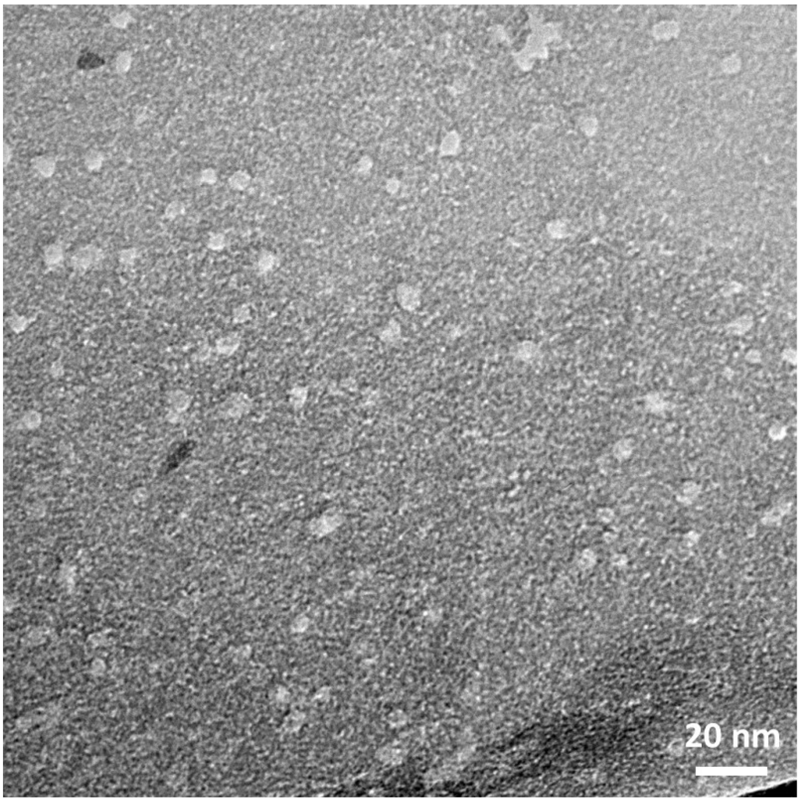

Fig. S3 TEM image of PG after HI acid treatment.

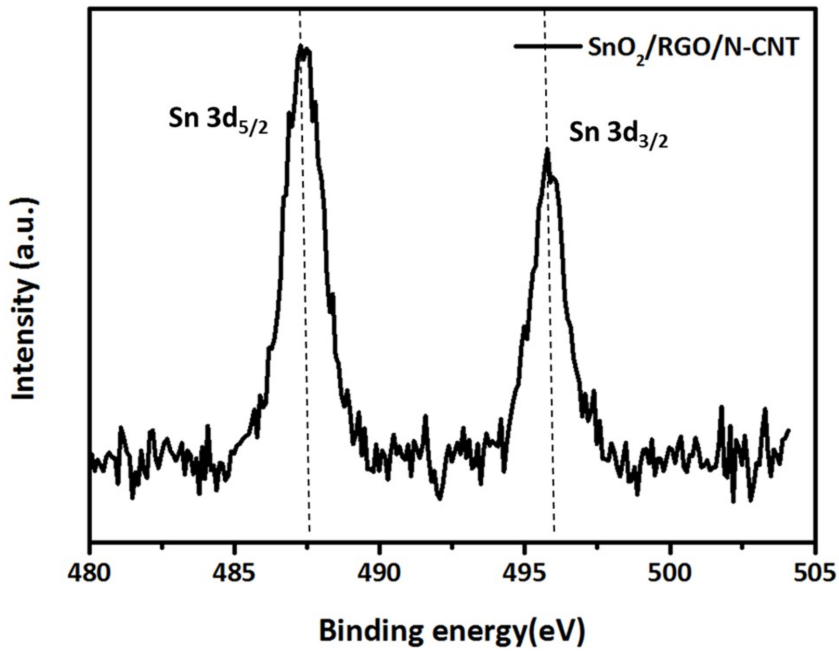

Fig. S4 Sn 3d peak of SnO_2/RGO/N-CNT. The Sn 3d XPS spectra of SnO_2/RGO/N-CNT show the Sn $3d_{5/2}$ and Sn $3d_{3/2}$ peaks associated with the SnO_2 nanocatalysts at 487.5 and 495.9 eV

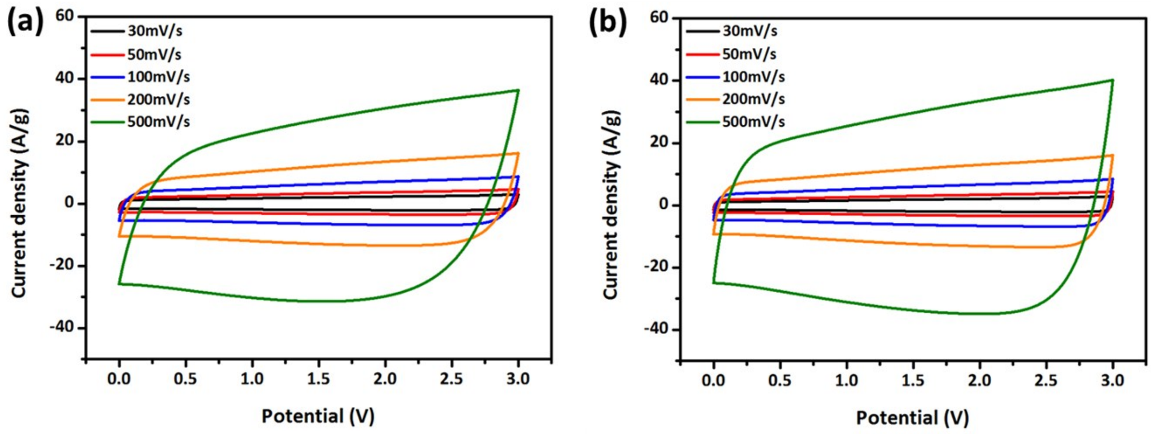

Fig. S5 Cyclic voltammograms of (a) PG and (b) PG/N-CNT-1 at scan rates of 30–500 mV/s.

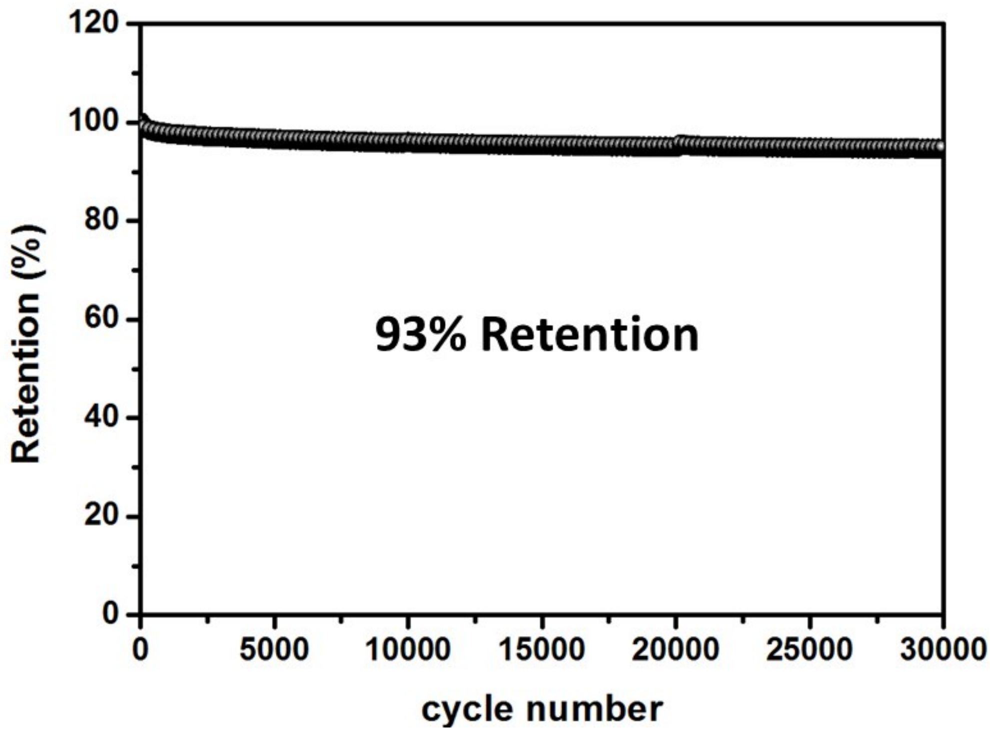

Fig. S6 Cycling stability of PG electrode at current density of 10 A/g.

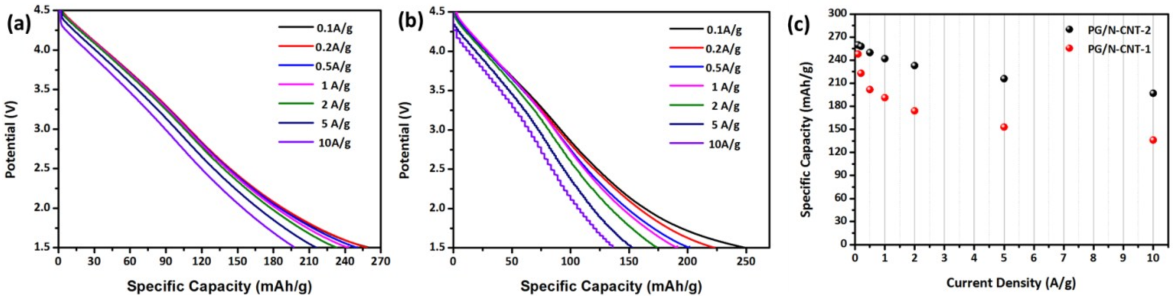

Fig. S7 Electrochemical properties of (a) PG/N-CNT-2 and (b) PG/N-CNT-1 as determined through half-cell tests in 1 M $LiPF_6$ in EC/DMC (1:1, v/v) electrolyte. (c) Specific capacities of PG/N-CNT-2 and PG/N-CNT-1 as functions of current densities.

Sample	Carbon (at. %)	Oxygen (at. %)	Nitrogen (at. %)
N-CNT	92.05	4.68	3.28

Table S1. Elemental contents data of N-CNT sample.

Table S2. Comparison of the specific capacitances of carbon-based electrodes.

Materials	**C_g (F/ g)**	**Electrolyte**	**Ref.**
Pillared graphene/CNT	144 (3.6 A/g)	1 M $TEABF_4$/PC	[1]
Graphene/CNT composite film	110 (1 A/g)	1 M $TEABF_4$/PC	[2]
Plasma reduced RGO paper	181 (10 mV/s)	1 M $TEABF_4$/ACN	[3]
Porous graphene	140 (0.1 A/g)	1 M $TEABF_4$/ACN	[4]
Activated graphene hydrogel	184 (0.2 A/g)	BMIM BF_4 ionic liquid electrolyte	[5]
hierarchically porous nanocarbon/graphene	185 (0.5 A/g)	EMIM BF_4 ionic liquid electrolyte	[6]
Activated graphene/CNT film	200 (0.5 A/g)	EMIM BF_4 ionic liquid electrolyte	[7]
Nitrogen-doped porous carbon/graphene	188 (5 A/g)	1 M $TEABF_4$/ACN	[8]
Sponge-templated activated graphene	207 (0.5 A/g)	1 M $TEABF_4$/ACN	[9]
Nanoperforated graphene/nitrogen-doped CNT	**288 (0.5 A/g)**	**1 M $TEABF_4$/ACN**	**This work**

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