Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information:

Highly flexible transparent conductive graphene /single-walled carbon nanotube nanocomposite films produced by Langmuir–Blodgett assembly

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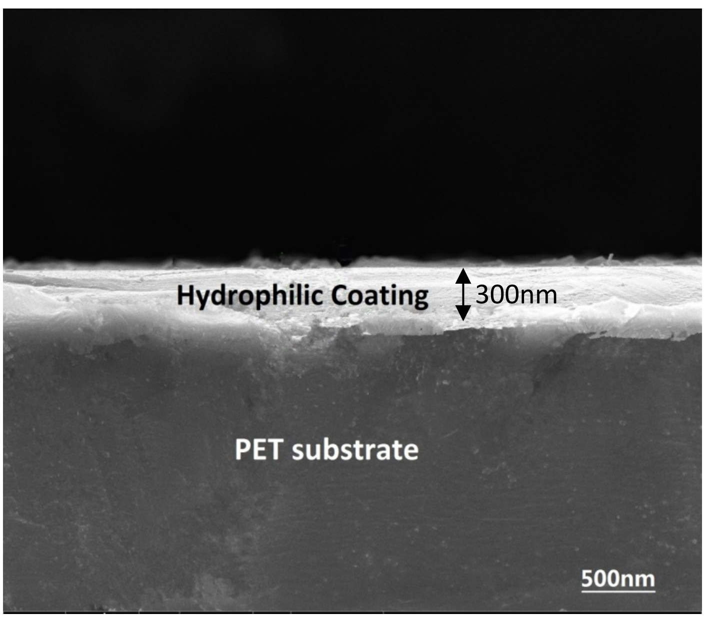

Fig. S1 Cross-sectional SEM micrograph of PET after hydrophilic coating.

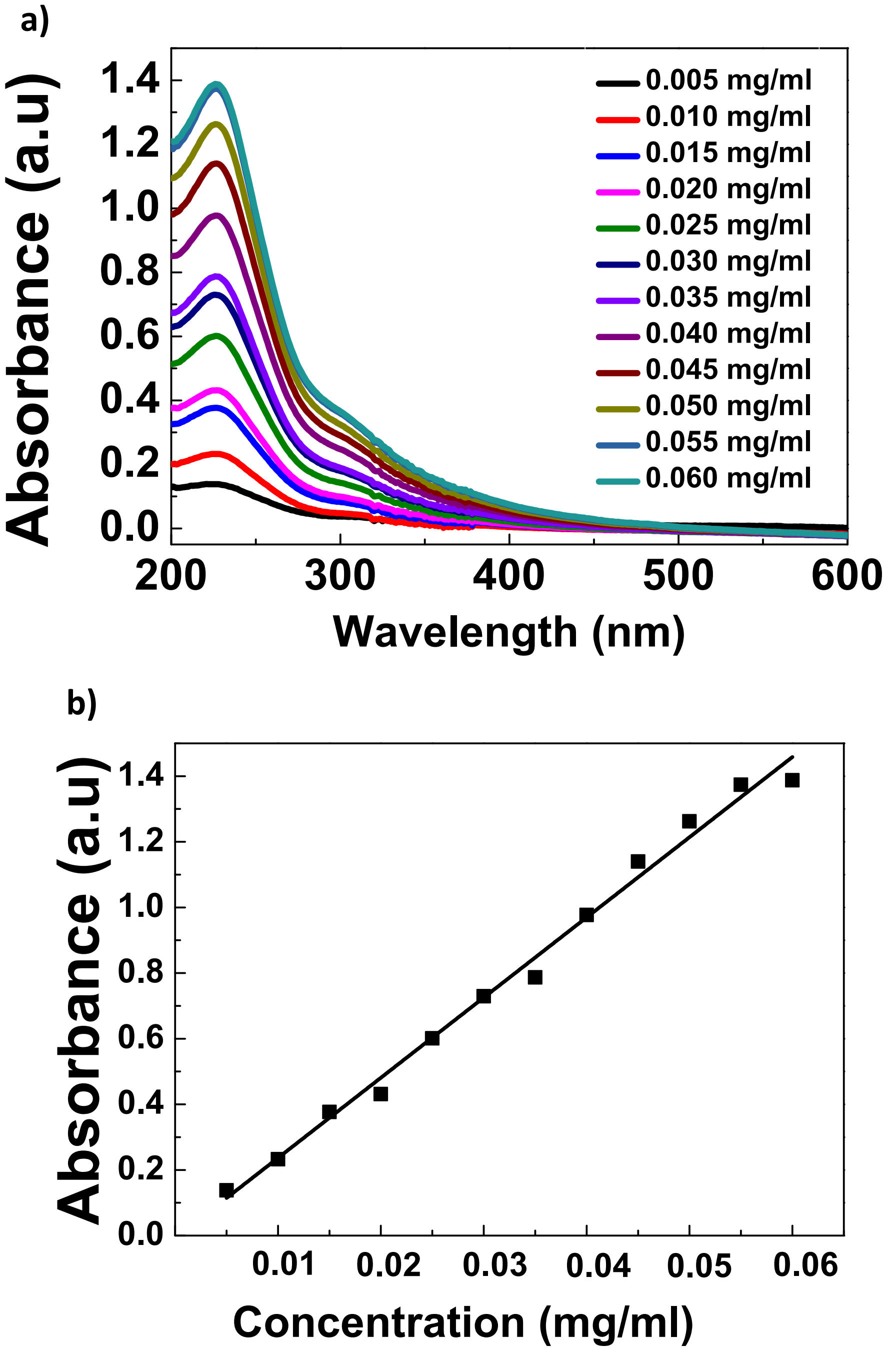

Fig. S2 (a) UV – vis spectra of UL-GO dispersed in water at varied concentrations. (b) Absorption at the peak as a function of the concentration of UL-GO.

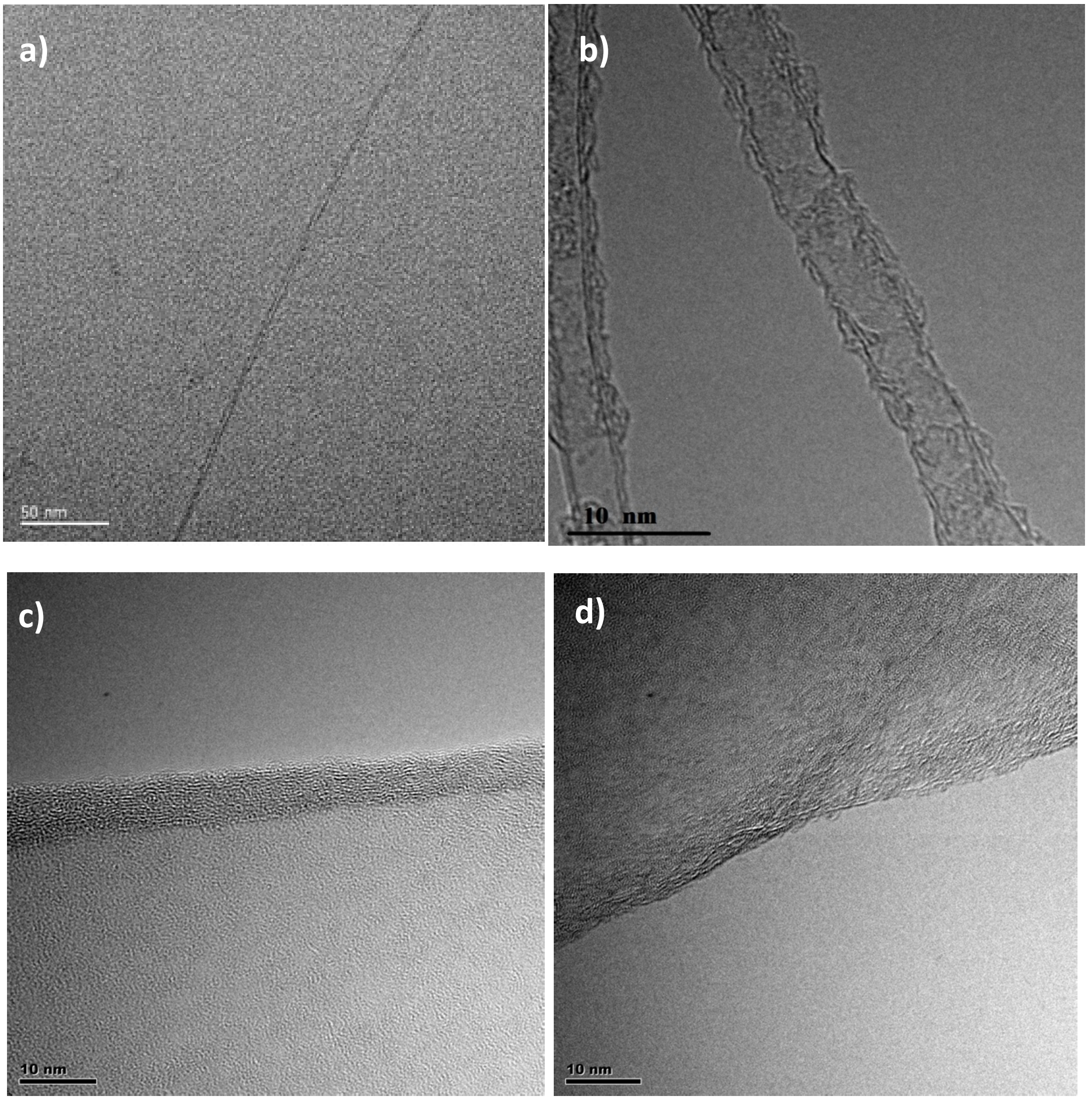

Fig. S3 TEM images of the COOH-functionalized SWCNTs (a-b) and GO sheet (c-d).

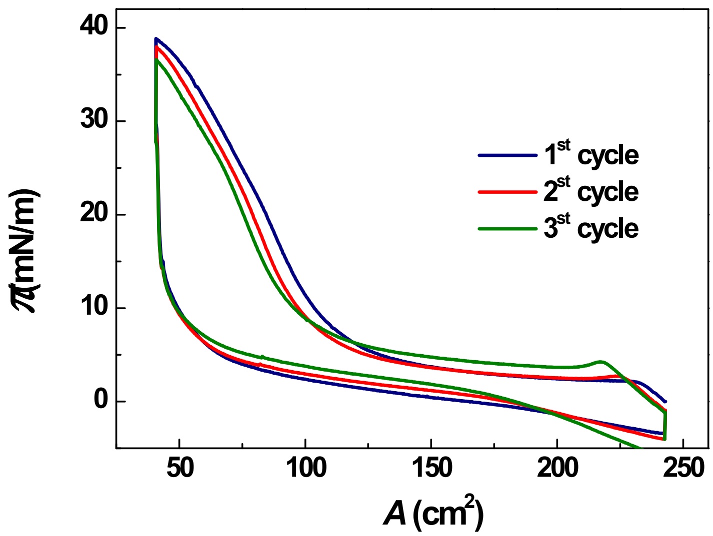

Fig. S4 Isotherm plots of three sequential compression/expansion cycles, confirming highly reversible and stable SWCNT monolayer against compression. The three curves essentially overlap on top of another over the whole area.

Table S1 Relative percentages of carbon and assignations of UL-GO/SWCNT and rUL-GO/SWCNT.

Binding energy and assignation	C-C*sp*^{2} ~284.8 eV	C=C*sp*^{3} ~285.6 eV	C-O ~286.6 eV	-C=O ~287.8 eV	-O-C=O ~290.3 eV
UL-GO/SWCNT	30.12%	20.51%	29.49%	17.69%	2,29%
HI-rUL-GO/SWCNT	51.95%	19.10%	13.10%	12.73%	1.92%

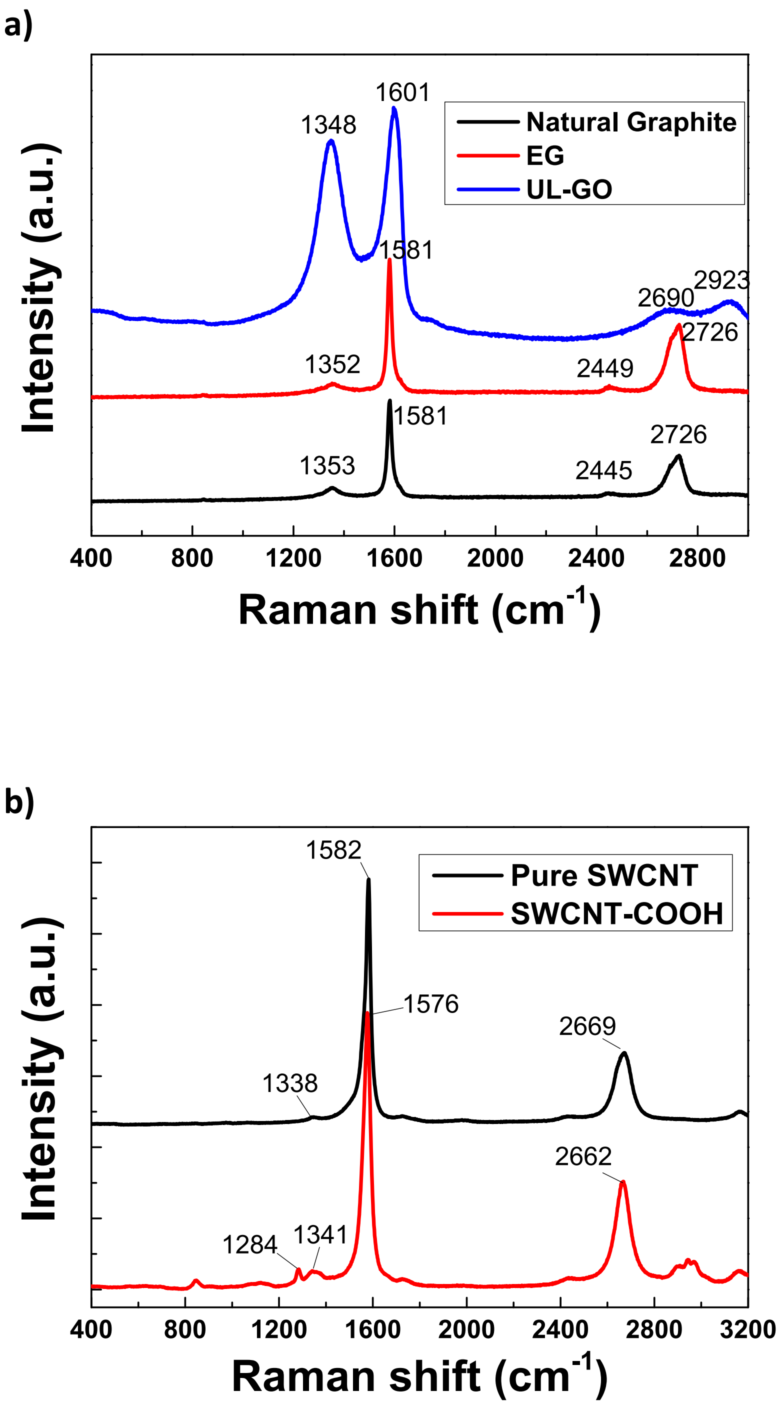

Fig. S5 (a) Raman spectra for natural graphite, EG and UL-GO. (b) Raman spectra for pure SWCNT and COOH-functionalized SWCNTs.

Table S2 Comparison of opto-electrical properties for TCFs made by solution based methods.

Fabrication Method	Graphene Type	Sheet Resistance (Ω/sq)	Transmittance (%)	σ_{DC}/σ_{OP}	Reference
L-B assembly	Hybrid films with SWCNTs	8100	90	0.443	Current work
	Expandable graphite exfoliated With DMF	$1.5x10^5$	92	0.03	Li *et al.*[1] Nature Nanotechnol. 2008, 3, 538
Transfer printing	High temperature annealing	$4.0x10^6$	95	0.0018	Kim *et al.*[2] Adv. Mater. 2010, 22, 1954
	High temperature annealing	6848	82	0.27	Wang *et al.*[3] Carbon
	Chemical reduction	$3.0x10^4$	80	0.05	Liu *et al.*[4] Nanotechnology 2009, 20, 465605
	Chemical Reduction+ High temperature annealing	$1.0x10^5$	65	0.008	Eda *et al.*[5] Nature Nanotechnol. 2008, 3, 270
Spin coating	Chemical Reduction+ High temperature annealing	$7.0x10^4$	65	0.011	Eda *et al.*[6] APL 2008, 92, 233305
	High temperature annealing	5000	80	0.32	Wu *et al.*[7] APL 2008, 92, 263302
	High temperature annealing	1750	70	0.55	Liang *et al.*[8] Nanotechnology, 2009, 20, 13 434007
	Chemical reduction	$1.1x10^4$	87	0.23	Zhu *et al.*[9] APL 2009, 95, 103104
Dip coating	High temperature annealing	1800	70	0.54	Wang *et al.*[10] Nano Lett. 2008, 8,323
	High temperature annealing	8000	70	0.12	Zhao *et al.*[11] Electrochimica Acta, 2009, 55, 491
	Chemical Reduction+ High temperature annealing	$11x10^6$	95	0.0007	Kim *et al.*[12] Langmuir, 2009, 25, 11302

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