Supplementary Information for:

Double-wall carbon nanotube transparent conductive films with excellent performance

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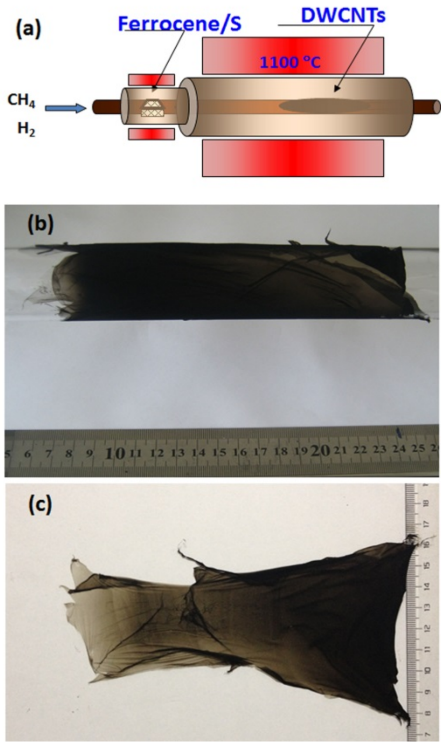

Figure S1. (a) Schematic showing the setup and growth process of the DWCNTs. (b-c) Optical photographs showing the size and morphology of the as-synthesized DWCNT samples.

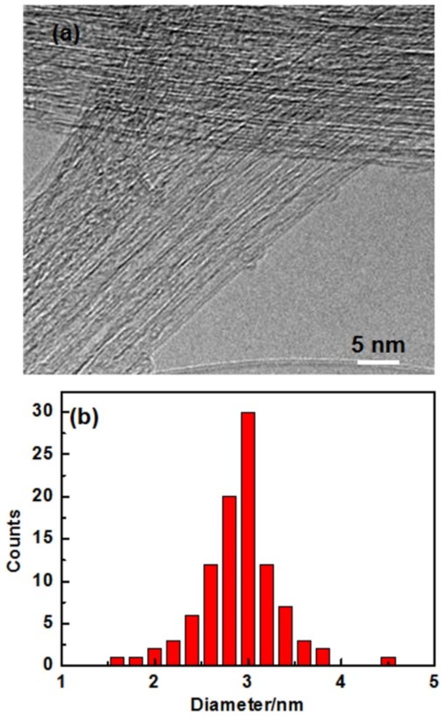

Figure S2. (a) Typical TEM image of the p-DWCNTs; (b) Diameter distribution of the p-DWCNTs measured from TEM observations.

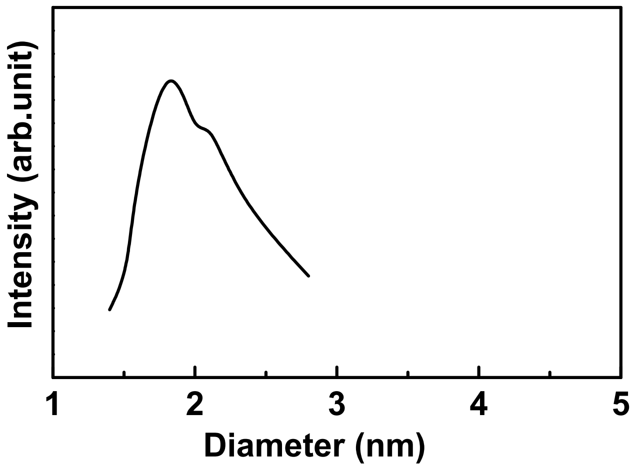

Figure S3. Diameter distribution of the DWCNTs plotted from Raman spectra excited by a 633 nm laser [1]

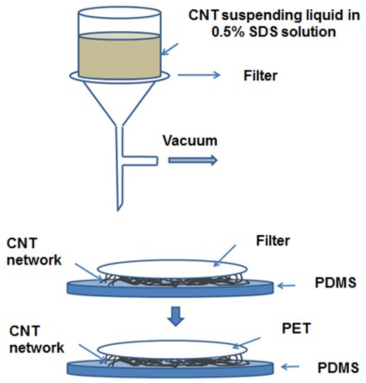

Figure S4. A flowchart showing the preparation of TCFs by a filtration method.

S1. Preparation of SWCNTs and SWCNT-TCFs.

SWCNTs were prepared by a FCCVD method similar with that of DWCNTs but different growth conditions. Simply, SWCNTs were synthesized at 1100 ºC using sulfur as growth promoter and CH_4 as carbon source under a hydrogen atmosphere. In a typical experiment, 200 sccm H_2 flowed into a quartz tube reactor with a diameter of

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50 mm. When the temperature of the reactor was increased to 1100 °C, a mixture of ferrocene and 0.5 wt % sulfur powder was pushed to a position inside the reactor with a temperature of 100 °C and was transported into the reaction zone by a 1000 sccm H_2 gas flow. Then 20 sccm CH_4 flow was introduced into the reactor. The process lasted for 30 min. Finally, the reactor was cooled to room temperature naturally. A membrane-like product was collected from the inner wall of the reactor. The as-prepared SWCNTs were purified using the same procedure for purifying DWCNTs, and the obtained SWCNTs are denoted F-SWCNTs. The synthesis and treatment procedure for SWCNT TCFs are identical to that of DWCNT TCFs.

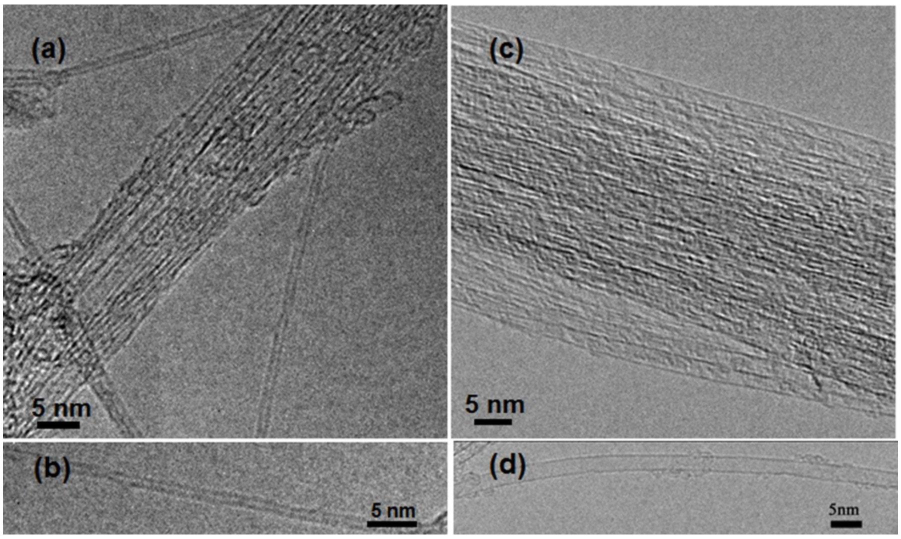

Figure S5. Typical TEM images of H-SWCNTs (a) and F-SWCNTs (b).

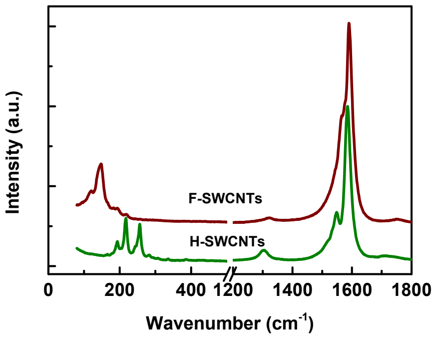

Figure S6. Typical Raman spectra of H-SWCNTs and F-SWCNTs with an excitation laser wavelength of 633 nm

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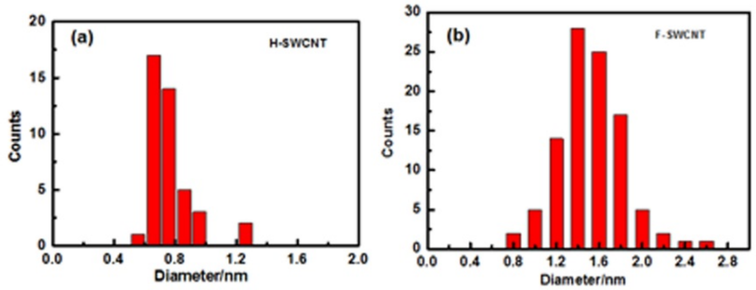

Figure S7. Diameter distribution of the H-SWCNTs (a) and F-SWCNTs (b) measured from TEM observations

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References

1. M. Endo, Y. A. Kim, T. Hayashi, H. Muramatsu, M. Terrones, R. Saito, F. Villalpando-Paez, S. G. Chou and M. S. Dresselhaus, *Small* 2006, ***2***, 1031.