LPD Silica Coating of Individual Single Walled Carbon Nanotubes

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Supplementary Materials





Fig. S1. ATR-IR of dried SiO₂-SWNTs, prepared from DTAB-SWNT solution, with assigned peaks.





Fig. S2. TGA of SiO₂-SWNTs in air.



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Fig. S3. ATR-IR of SiO₂-SWNT solid after heating to 1000 °C.





Fig. S4. Raman (532 nm excitation) of SiO₂-SWNT solid after heating to 1000 °C.

Fig. S5. Deconvoluted C1s XPS spectra for (a) raw SWNTs and (b) SiO₂-SWNTs.

Fig. S6. X-ray diffraction from SiO_2 -SWNTs showing the amorphous halo due to the silica coating.

Fig. S7. Electron dispersive spectrum (EDS) of SiO₂-SWNT fabric on Au.

Fig. S8. Raman spectra (532 nm excitation) showing the G' mode of SWNT during the coating reaction.

Fig. S9. SEM of SiO₂-SWNTs formed from DTAB-SWNT solution after 15 min reaction in LPD solution.

Fig. S10. SEM images of silica layer with SiO_2 -SWNTs formed from DTAB-SWNT solution with an excess of silica, showing the coated SWNTs emerging from underneath and between cracks in the silica matrix.

Fig. S11. SEM of SiO₂-SWNTs, prepared from DTAB-SWNT solution, with excess SiO₂ colloids.

Fig. S12. SEM images of SiO₂-SWNTs (a) before and (b) after TGA to 1000 $^{\circ}$ C.

Fig. S13. SEM image of etched ends of coated SWNTs.

Fig. S14. Schematic representation of spontaneous interconnects between exposed SWNTs.

Fig. S15. Raman spectrum of SDS-SWNT solution (red) with subsequent addition of LPD growth solution (gray). The inset image shows the relative intensities of the Raman G band (blue) and the 8,3 SWNT fluorescence band (green) as a function of reaction time.

Fig. S16. Raman spectrum of DTAB-SWNT solution at varying pH.

Fig. S17. Raman spectra (532 nm excitation) showing the D and G modes of SWNT during the coating reaction.

Fig. S18. Raman spectrum (785 nm excitation) of SWNT coating reaction showing the D and G modes, (a) before and (b) after LPD silica coating.

Fig. S19. Normalized UV/vis spectrum of 1% DTAB-SWNT solution (pink) versus SiO₂-SWNT solution (blue).

Fig. S20. SEM of SiO₂-SWNT "fabric," formed from DTAB-SWNT solution, deposited onto an aluminum SEM stub.

Fig. S21. SEM images of SiO_2 -SWNT fabric on the edge of a cut PES filter.

Sample	raw SWNT (eV)	SiO ₂ -SWNT (eV)
C1s	284.36	284.52
	285.35	285.25
	287.10	288.43
	290.50	290.34
O1s	530.47	532.42
	534.67	536.48
Si2p	n/a	105.30
		107.13
F1s	n/a	689.45

Table S1. XPS binding energies for raw and SiO_2 -SWNTs.