Supporting information for

Enrichment Mechanism of Semiconducting Single-walled Carbon Nanotubes by Surfactant Amines

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Figure S1. High resolution transmission electron micrographs of 57ECA-assisted *sem*-enriched SWNTs.

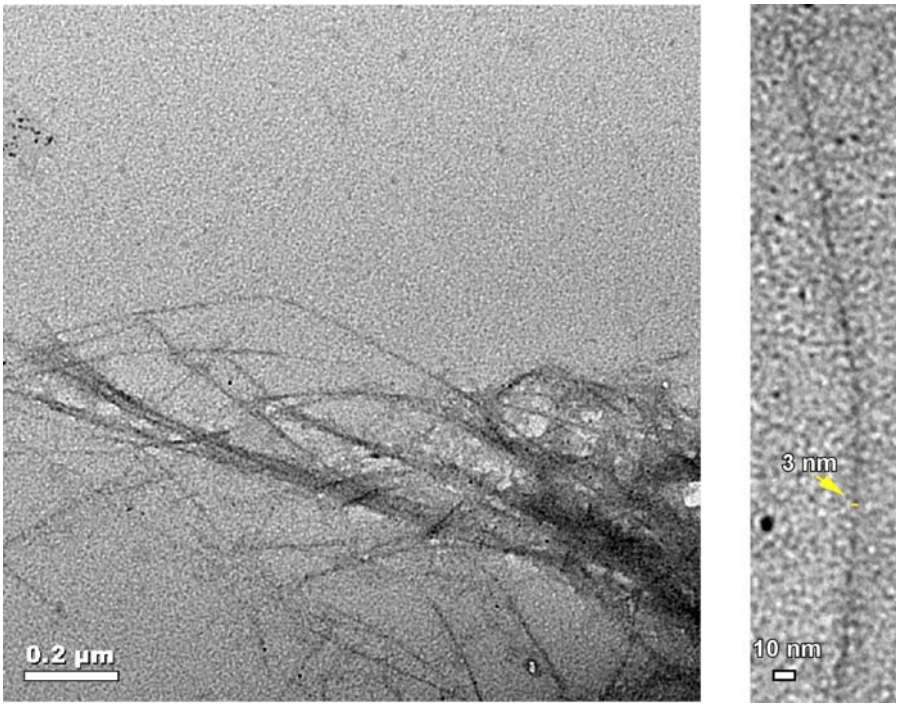


Figure S2. 2D ^{1}H - ^{1}H correlation spectroscopy (COSY) of neat 57ECA.

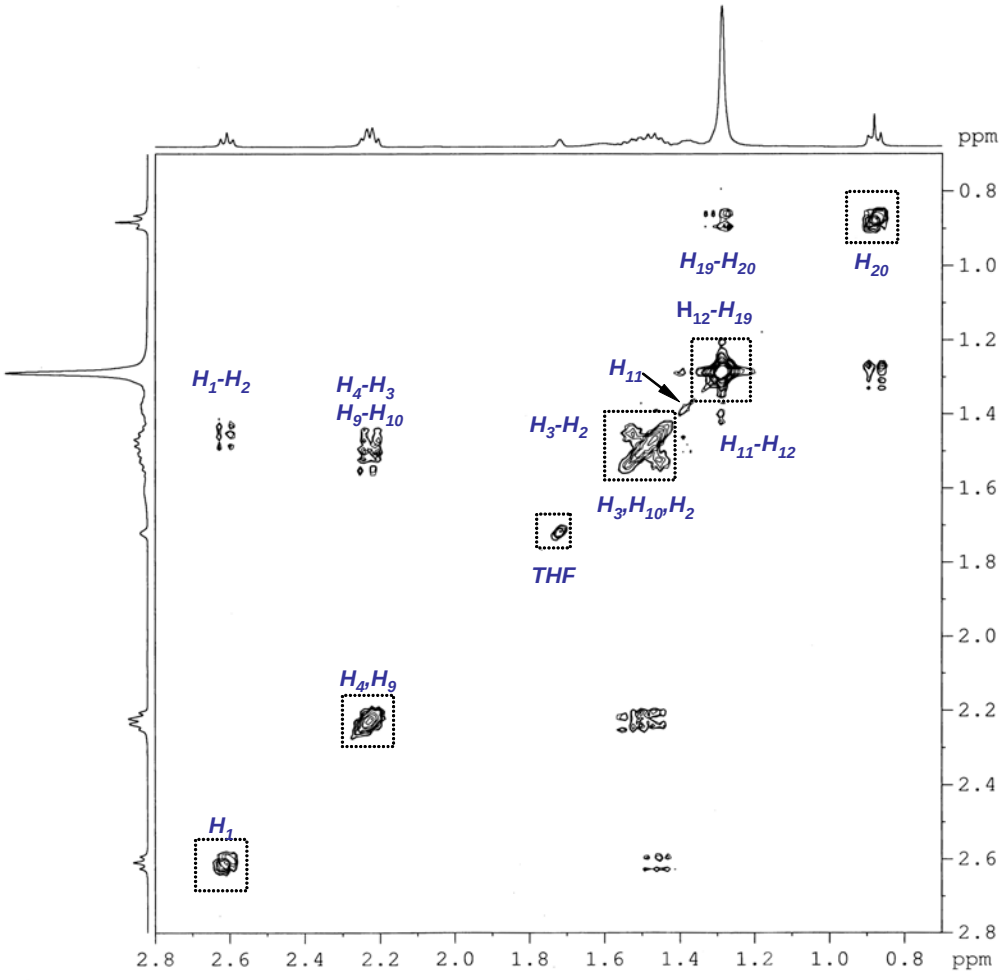


Figure S3. ^{1}H - ^{13}C heteronuclear multiple bond correlation (HMBC) spectra of neat 57ECA sample. Red boxes indicate direct ^{1}H - ^{13}C correlations (*i.e.*, $^{1}J_{C\text{-}H}$), while black boxes depict ^{1}H - ^{13}C correlations through space (*i.e.*, $^{3}J_{C\text{-}H}$ and $^{4}J_{C\text{-}H}$).

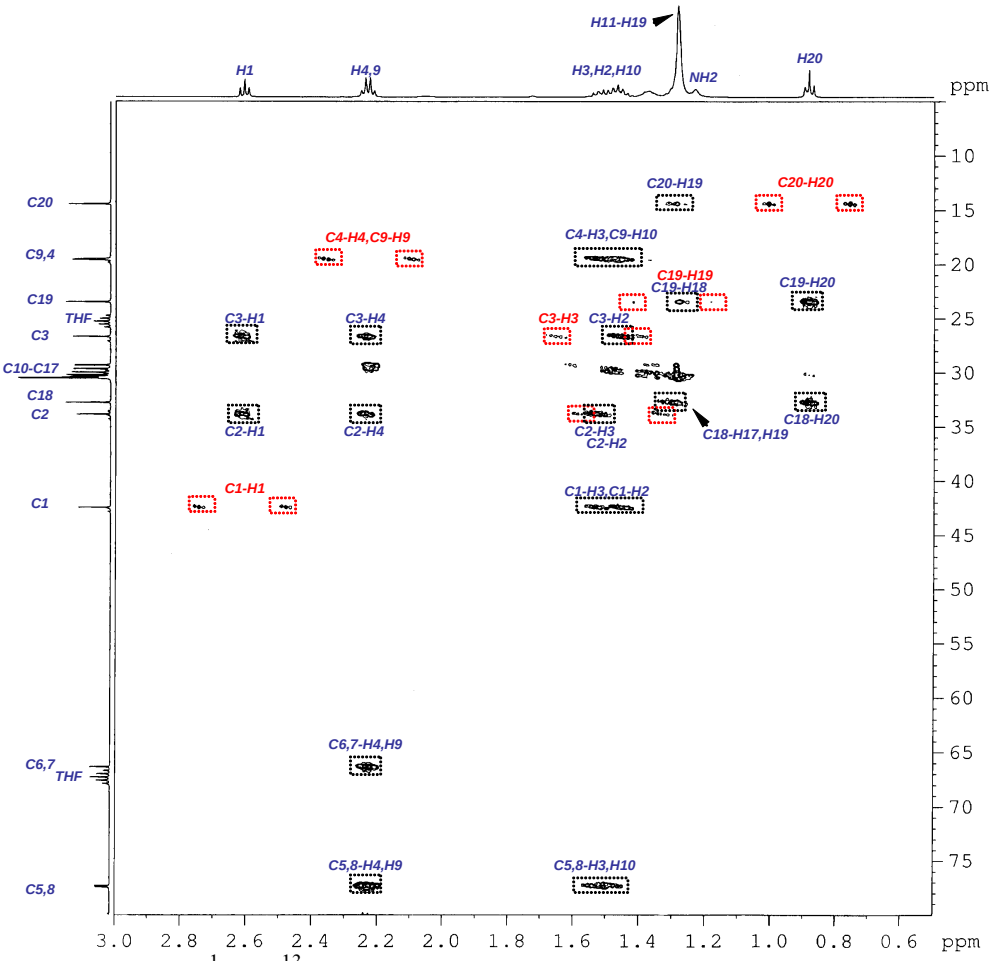


Figure S4. Close-up of the ^{1}H - ^{13}C heteronuclear multiple bond correlation (HMBC) spectrum of Figure S3 focusing in the C_{10} to C_{17} region.

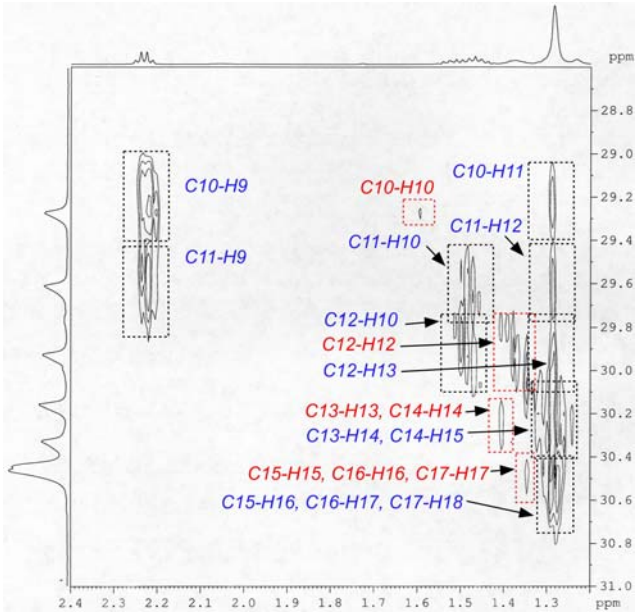


Figure S5. Effect of acidity on the 57ECA ^{1}H NMR position of water in THF-d_8 solution. **(A)**, **(B)**, **(C)**, and **(D)** spectra correspond to 20 μL additions of pH 5, 4, 3, and 2 HCl-acidified D_2O.

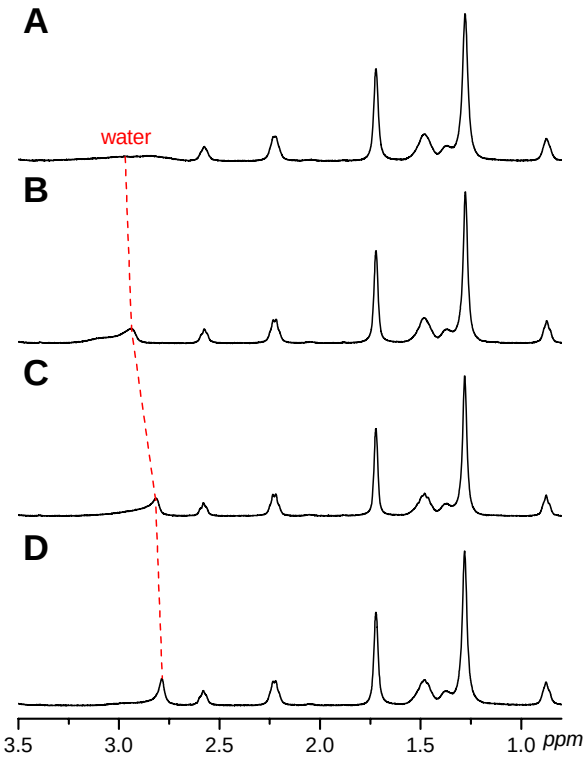


Figure S6. (**A**) ^{1}H NMR spectrum of ODA in THF-d_8 at 27 °C. (**B&C**) ^{1}H NMR spectra of ODA-treated SWNTs at 27 and 57 °C, respectively. This confirms that the absence of ^{1}H peak in (**B**)&(**C**) is not due to H_2O.

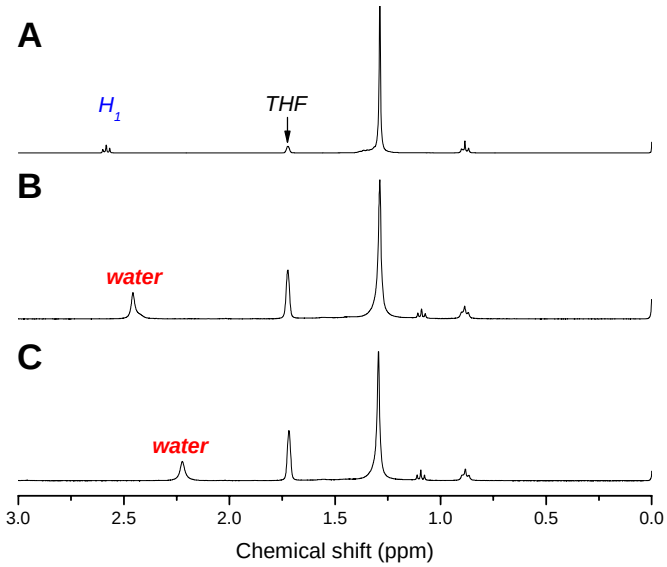
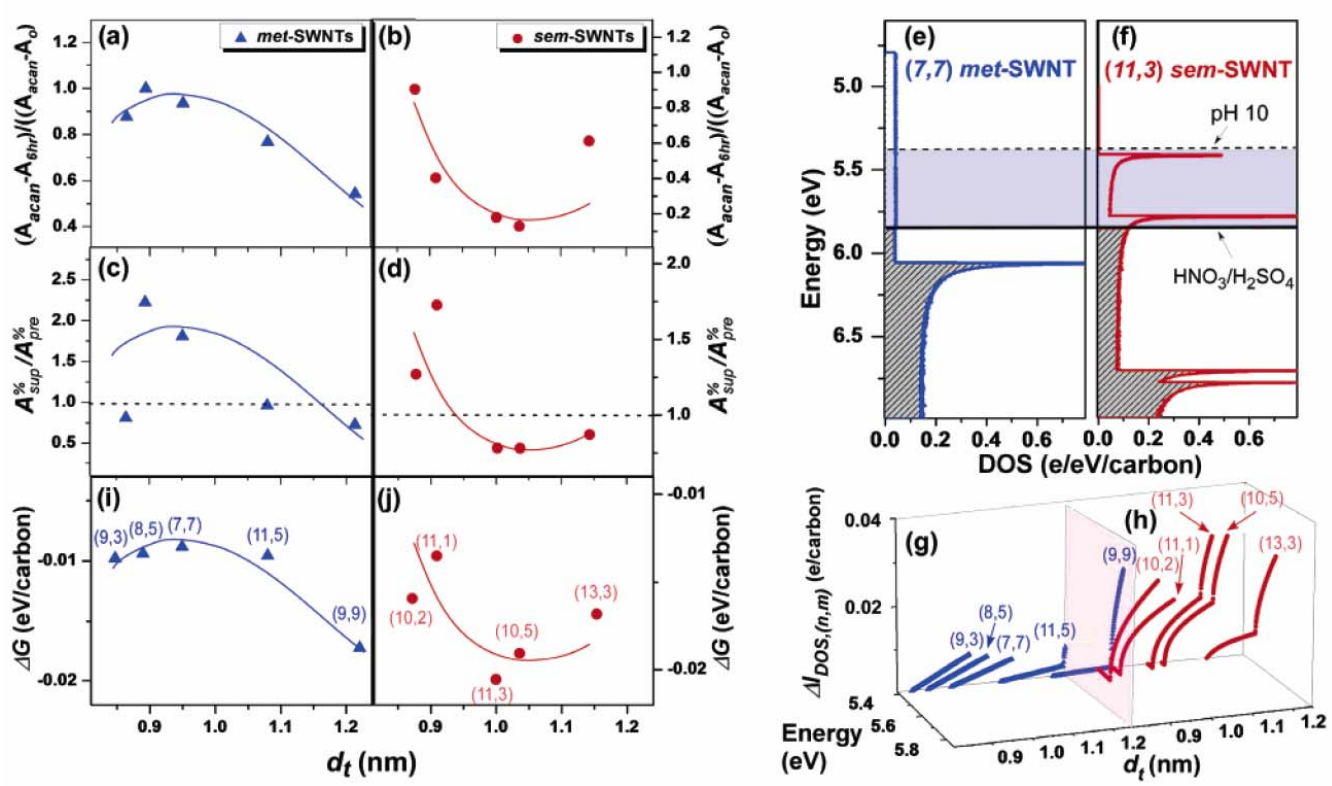


Figure S7. **(a, b)** Deconvoluted RRS RBM peak-area change ratios (A_{acan} - A_{6h})/(A_{acan} - A_0) between annealed and 0 and 6 h DMF-aged samples as a function of diameter (d_t) for *met*- and *sem*-SWNTs. Larger (A_{acan} - A_{6h})/(A_{acan} - A_0) values indicate resistance to pH of 10 assisted reduction of SWNTs toward their pristine, unoxidized state. **(c, d)** d_t-dependent abundance ratio in the supernatant (sup) *vs* precipitate (pre) fractions after 30 days of undisturbed sedimentation. Placement of the data points above or below the broken lines indicates enrichment of the respective d_t at the supernatant or precipitate, respectively. **(e, f)** Schematic representation of the valence density of states (DOS) with respect to vacuum for a (7,7) *met*- and (11,3) *sem*-SWNTs. The horizontal solid and broken lines racket the shaded redox jump between the estimated HNO_3/H_2SO_4 oxidation level and the pH 10 H^+/O_2 reduction potential, respectively. **(g, h)** Change of integrated DOS ($\Delta I_{DOS,(n,m)}$) for representative (n,m) *met*- and *sem*-SWNTs. **(i, j)** Calculated reduction free energy (ΔG) for the indicated redox jump (*i.e.*, shaded region in **(e&f)** as a function of d_t for *met*- and *sem*-SWNTs, respectively. The curves in parts **a-d** as well as **i** and **j** are for guiding the eye toward the d_t- and metallicity-dependent trends. Adapted with permission from Ref. 1, Copyright 2005 American Chemical Society.



Reference

1. Kim, S. N.; Luo, Z.; Papadimitrakopoulos, F., *Nano Lett.* 2005, *5*, 2500-2504.