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Templated direct growth of ultra-thin double-walled carbon nanotubes: supplementary information†

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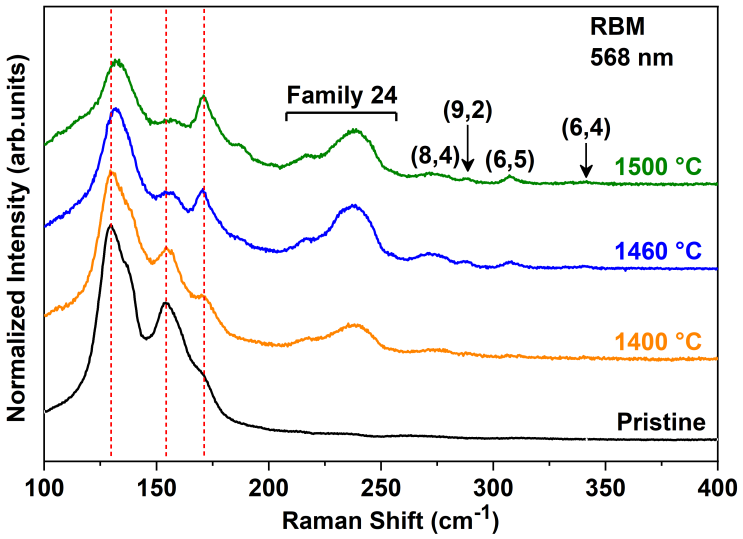

Fig. S1 RBM region of Raman spectra of pristine eDIPS-1.7 nm SWCNTs and annealed sample at 1500 °C excited by a 568 nm laser.

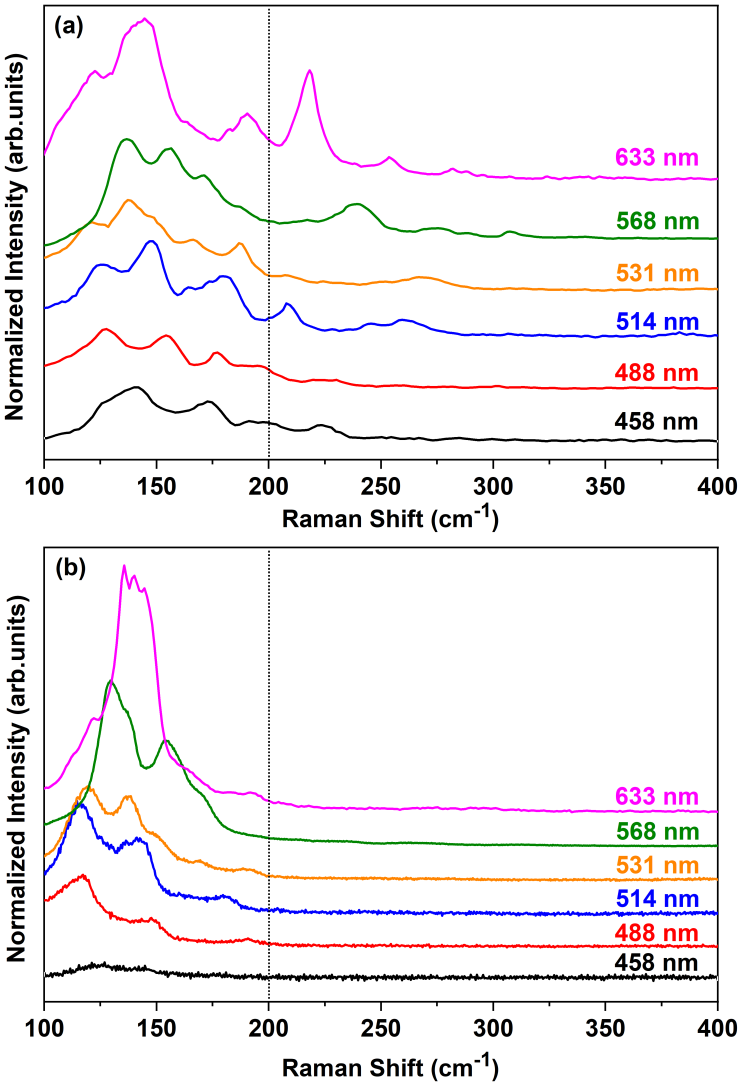

Fig. S2 RBM region of Raman spectra of annealed (a) and pristine (b) eDIPS-1.7 nm SWCNTs excited by multi-frequency Raman spectroscopy.

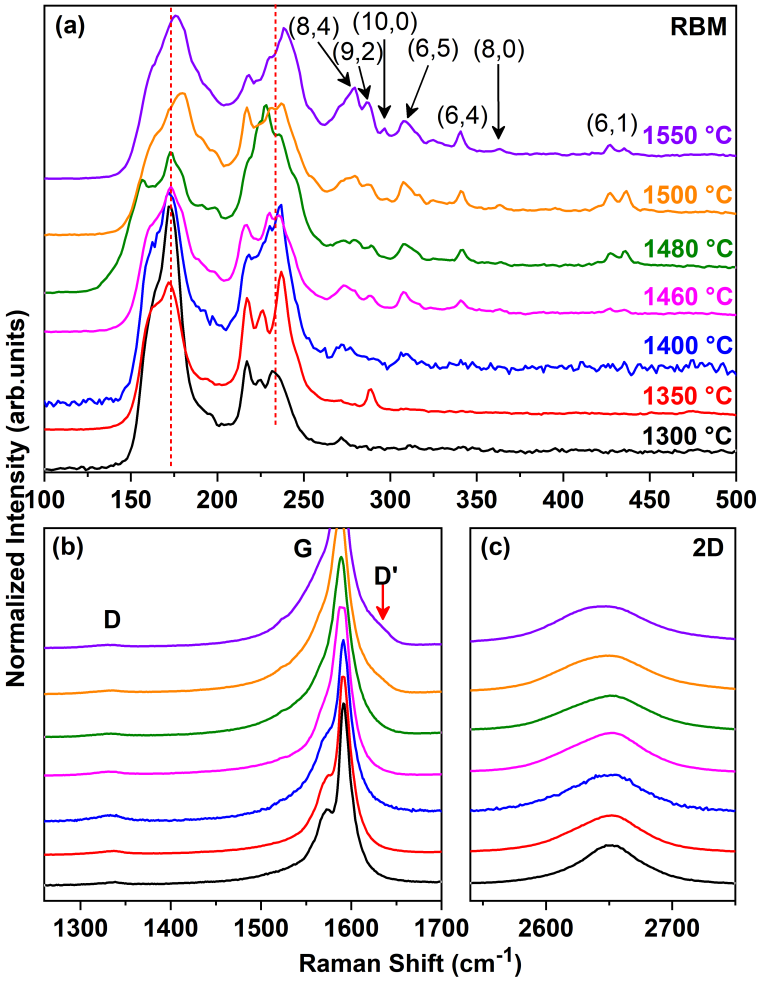

Fig. S3 Raman spectra of annealed samples at different temperatures excited by a 568 nm laser. (a) RBM, (b) D and G-bands, (c) 2D–band.

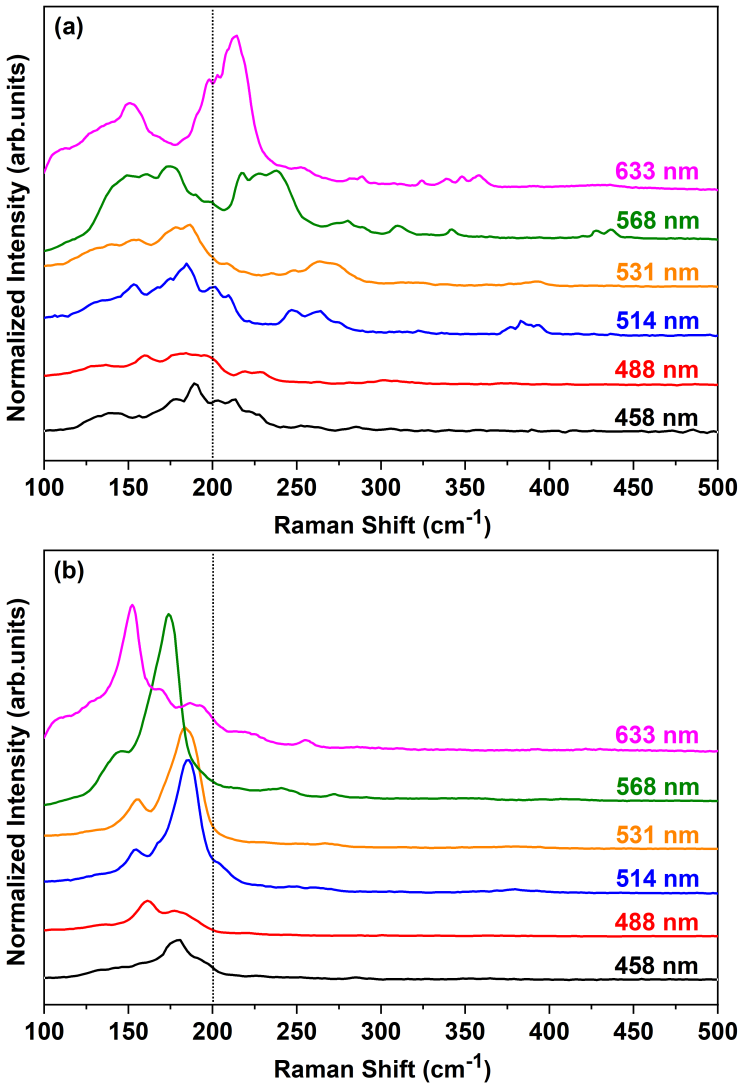

Fig. S4 RBM region of Raman spectra of annealed (a) and pristine (b) eDIPS-1.3 nm SWCNTs excited by multi-frequency Raman spectroscopy.

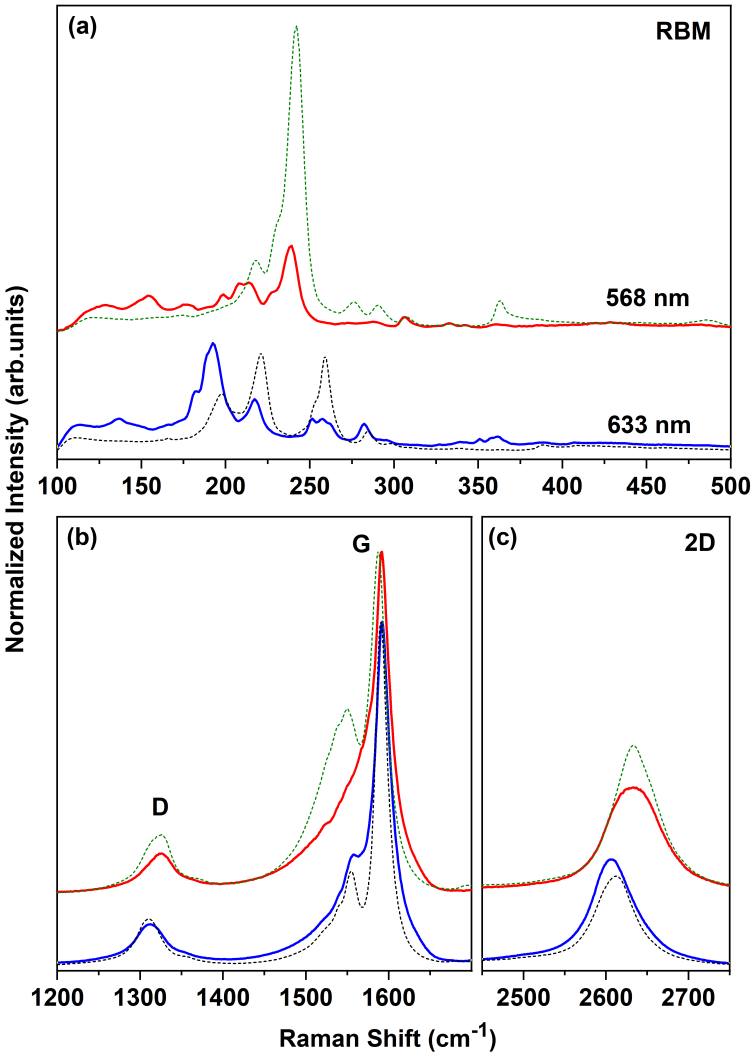

Fig. S5 Raman spectra of the pristine HiPco SWCNTs and annealed sample at 1500 °C excited by 568 and 633 nm lasers. (a) RBM, (b) D and G-bands, (c) 2D–band.

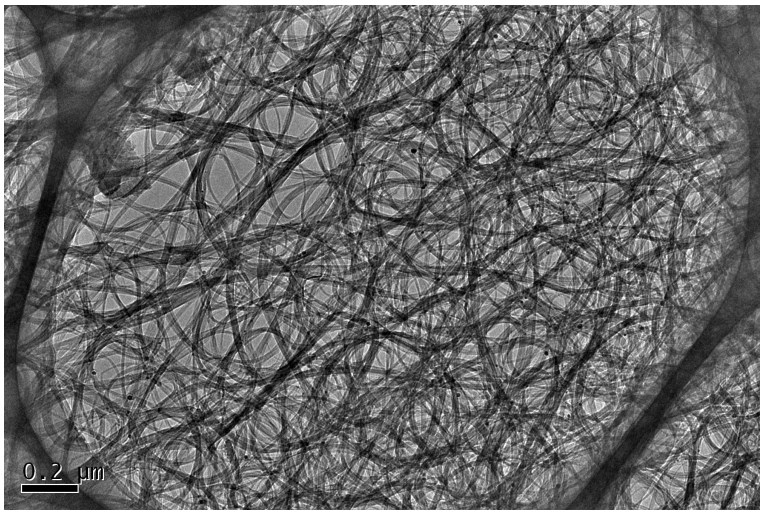

Fig. S6 TEM image ofeDIPS-1.3 SWCNTs annealed at 1500 °C. The sample has high purity. Only very few catalyst particles could be observed.

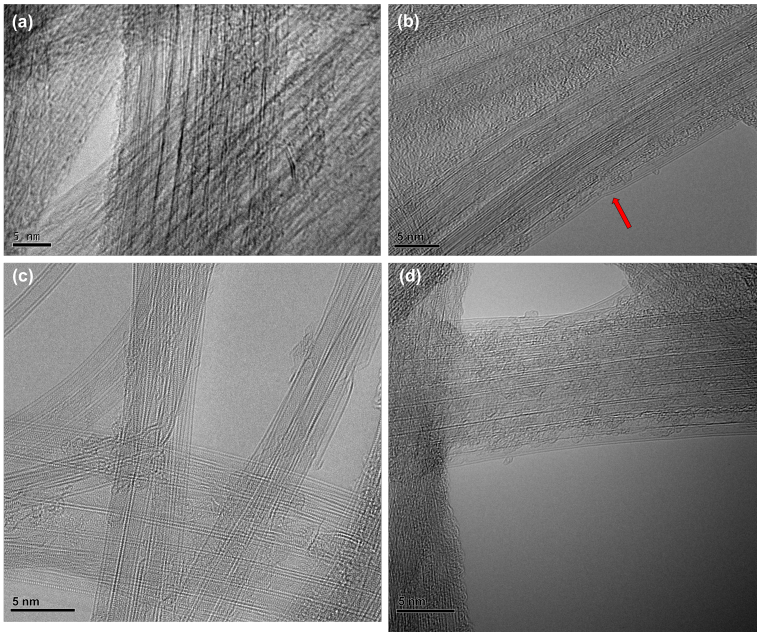

Fig. S7 Bundles of double-walled carbon nanotubes. The arrow in (b) indicates the transformation position between the double-walled carbon nanotube and triple-walled carbon nanotube with an addition inner tube.

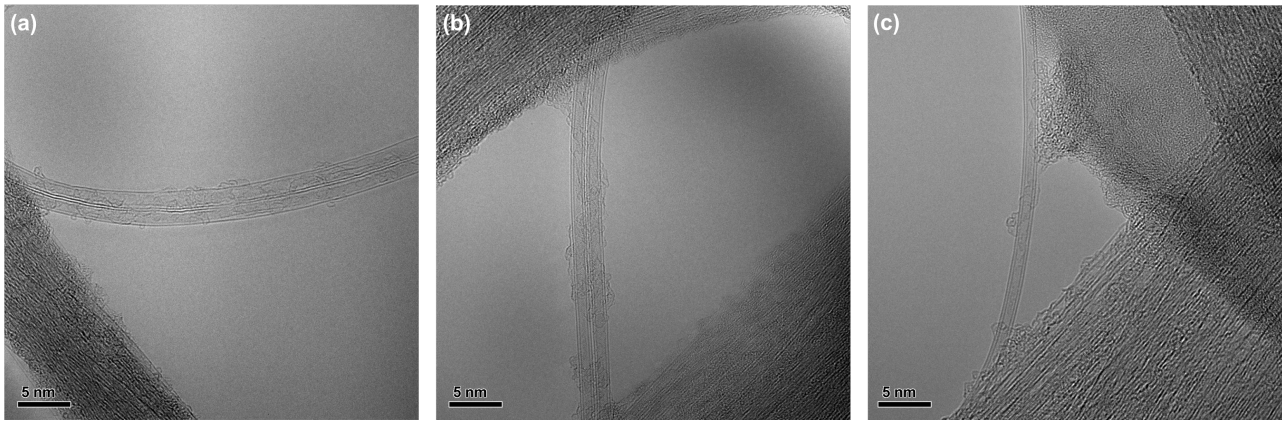

Fig. S8 HRTEM images of several isolated double-walled carbon nanotubes.

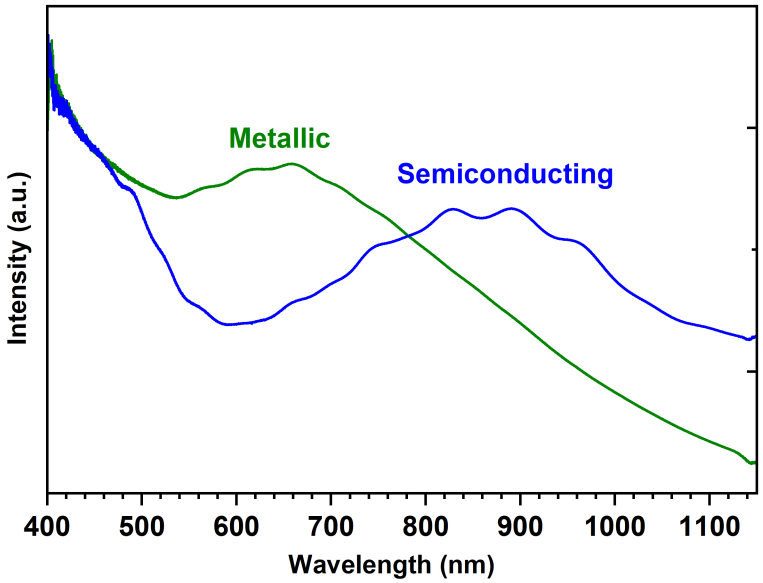

Fig. S9 Optical absorption spectra indicate the high-purity of separated metallic and semiconducting SWCNTs.

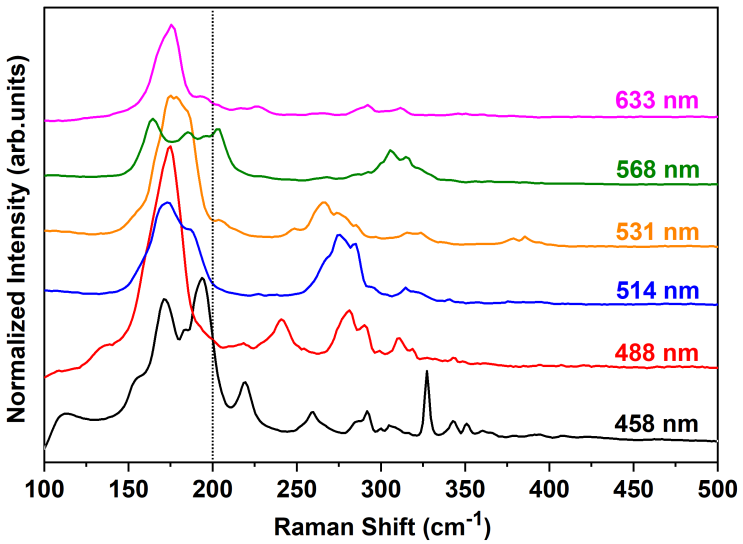

Fig. S10 RBM region of Raman spectra of annealed semiconducting arc-discharge SWCNTs at 1500 °C excited by multi-frequency Raman spectroscopy.

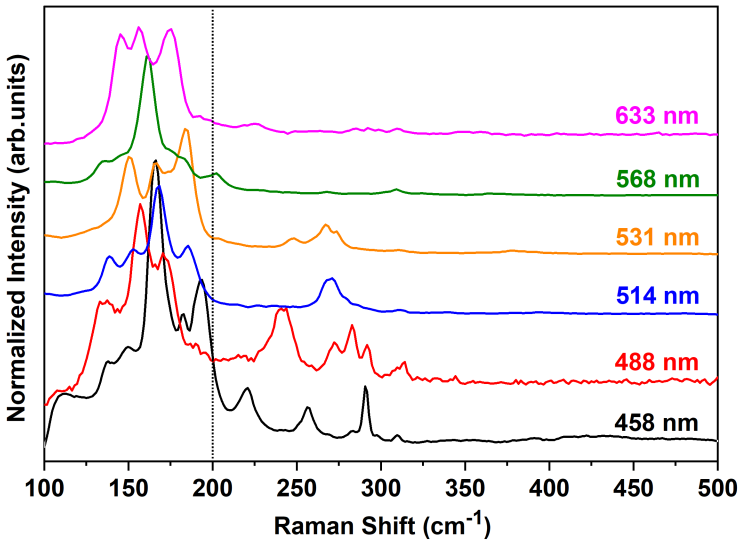

Fig. S11 RBM region of Raman spectra of annealed metallic arc-discharge SWCNTs at 1500 °C excited by multi-frequency Raman spectroscopy.