

Chirality specific and spatially uniform synthesis of single-walled carbon nanotubes from sputtered Co-W bimetallic catalyst

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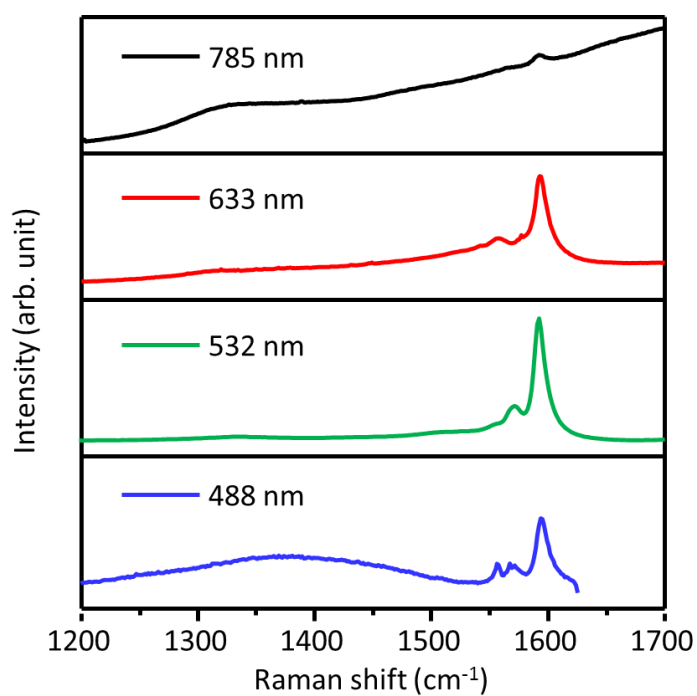


Figure S1. Characteristic Raman spectra (G-band region) of SWNTs grown from sputtered Co-W. The catalyst reduction and CVD reaction were performed at 750°C.

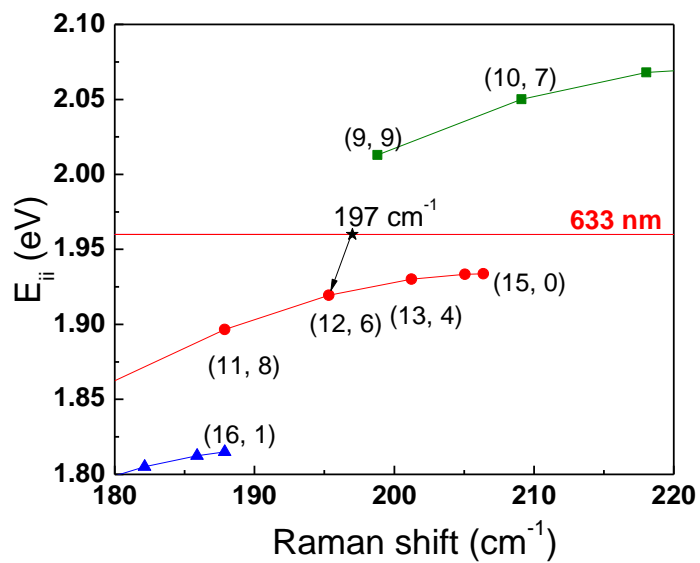


Figure S2. Assignment of SWNTs at 197 cm⁻¹ according to the Kataura plot. A relation of RBM frequency and diameter of $\omega_{\text{RBM}} = 235.9/d_t + 5.5$ was utilized. The red horizontal line corresponds to the excitation energy of 633 nm laser.

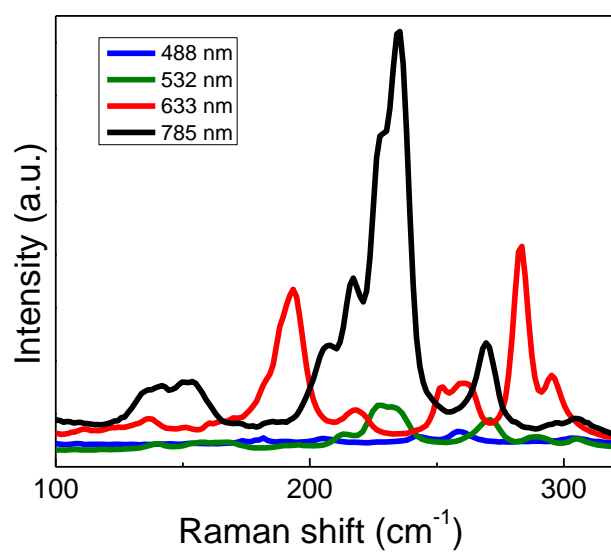


Figure S3. Raman spectra (RBM region) of SWNTs grown from sputtered Co. The catalyst was reduced at 600°C and grown at 750°C.

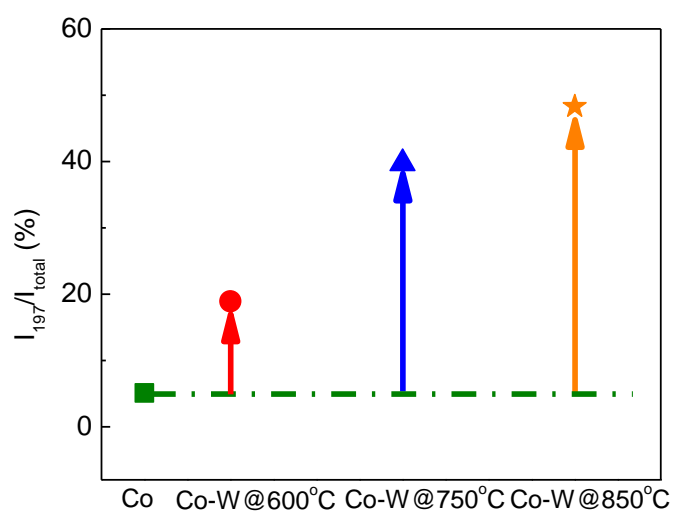


Figure S4. Relative intensities of the 197 cm⁻¹ peak with respect to the total sum intensity of RBM peaks changes between different conditions.

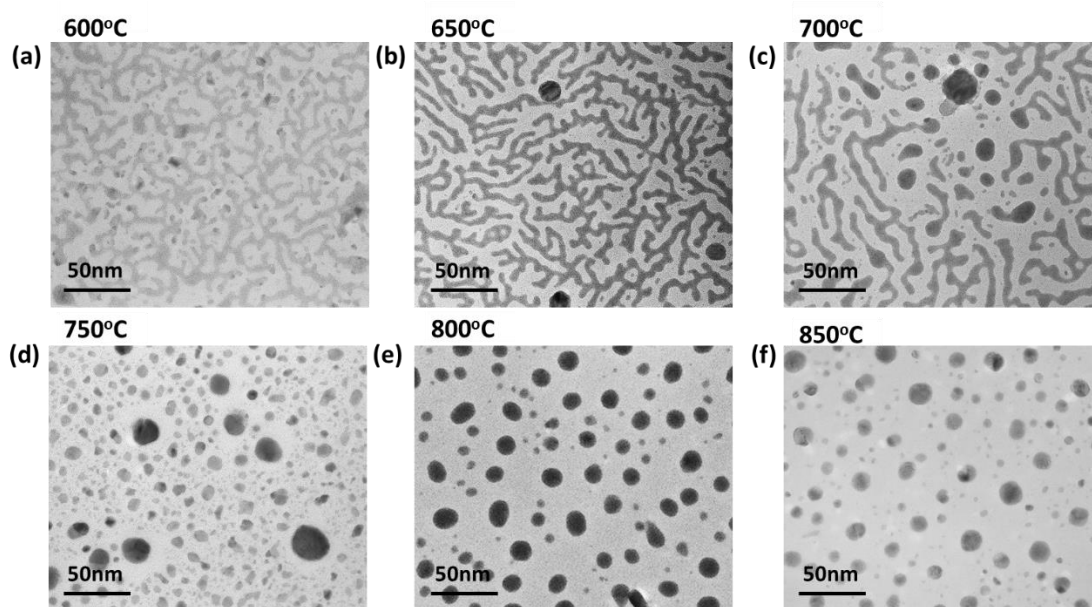


Figure S5. Characteristic TEM images of Co-W catalyst reduced at different temperatures (a) 600°C, (b) 650°C, (c) 700°C, (d) 750°C, (e) 800°C, and (f) 850°C, showing the morphology transition from wormlike structure to spherical particles. The strong interaction/reaction between Co and W starts from a temperature as low as (c) 700°C.

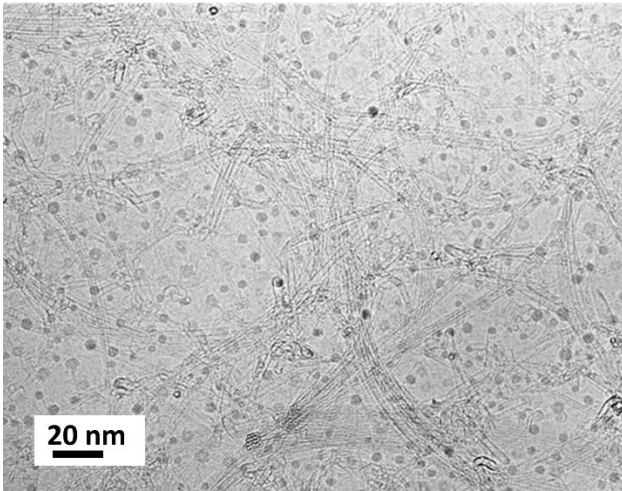


Figure S6. A characteristic TEM image of SWNTs grown from Co monometallic catalyst, showing that the particles are mostly 1-5 nm and the SWNTs are around 3.6 nm in diameter. Catalyst particles larger than 5 nm are hardly observed.