Supporting Information

$CoPt/CeO_2$ Catalysts for Growth of Narrow Diameter Semiconducting Single-walled Carbon Nanotubes

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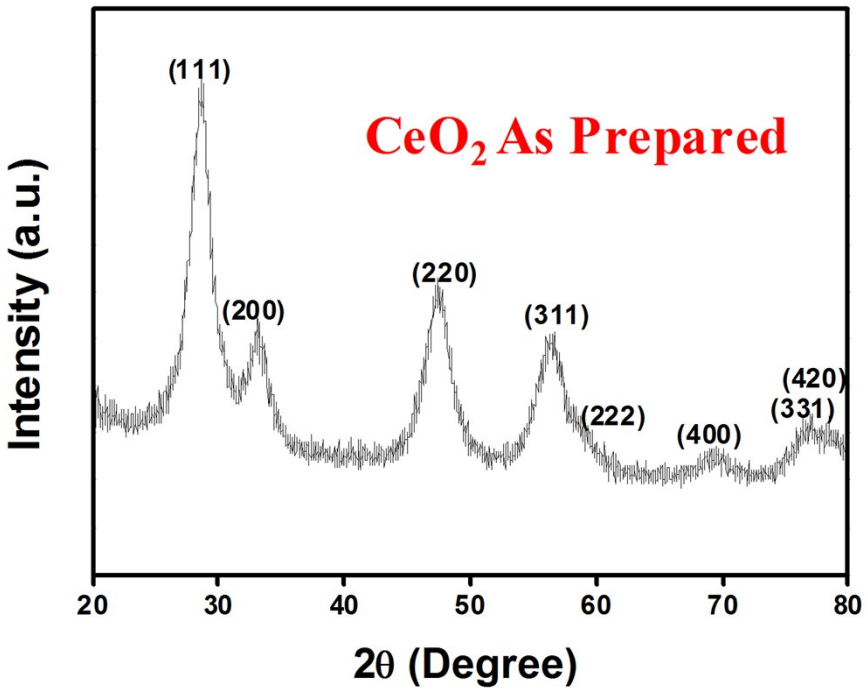

Figure S1. XRD of mesoporous CeO_2 .

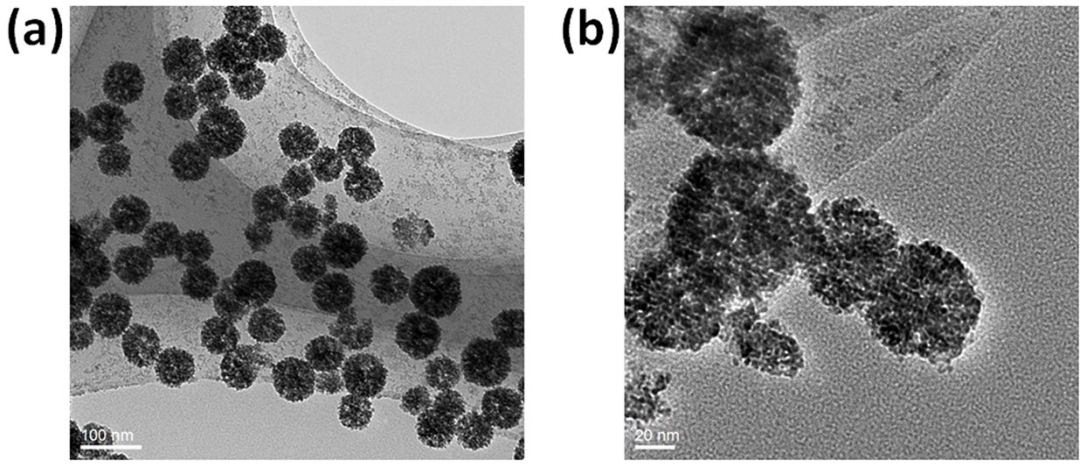

Figure S2. Typical TEM images of mesoporous CeO_2. (a) The low magnification. (b) The high magnification.

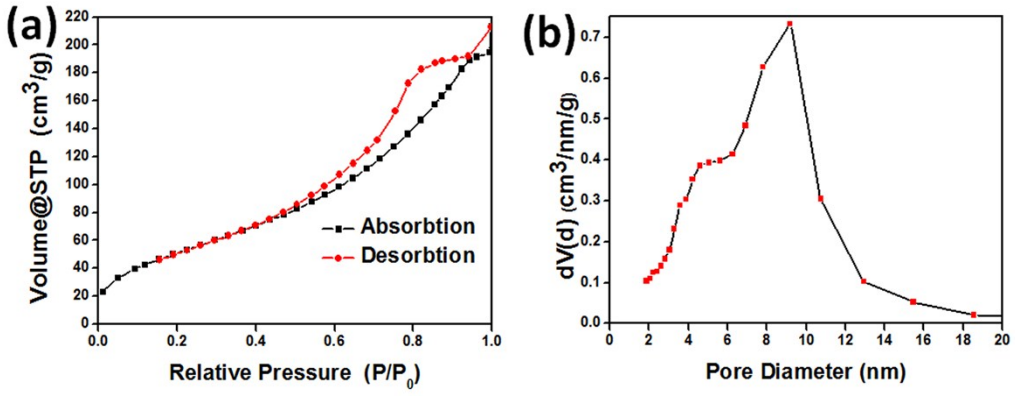

Figure S3. (a) N_2 adsorption and desorption isotherms of mesoporous CeO_2. (b) B-J-H pore size distribution curves of mesoporous CeO_2.

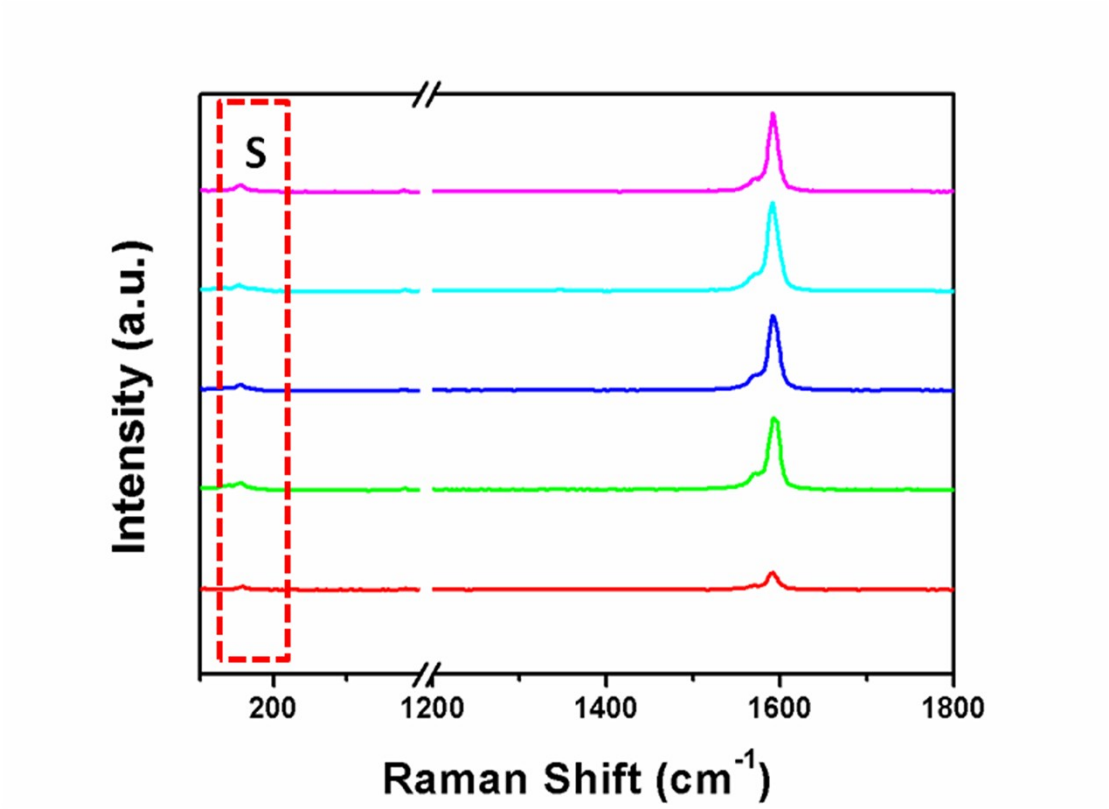

Figure S4. The RBM peak and G bands from the as-grown SWNTs using the uniform $CoPt/CeO_2$ catalysts show the as-grown SWNTs are s-SWNTs. The excitation wavelength is 532 nm.

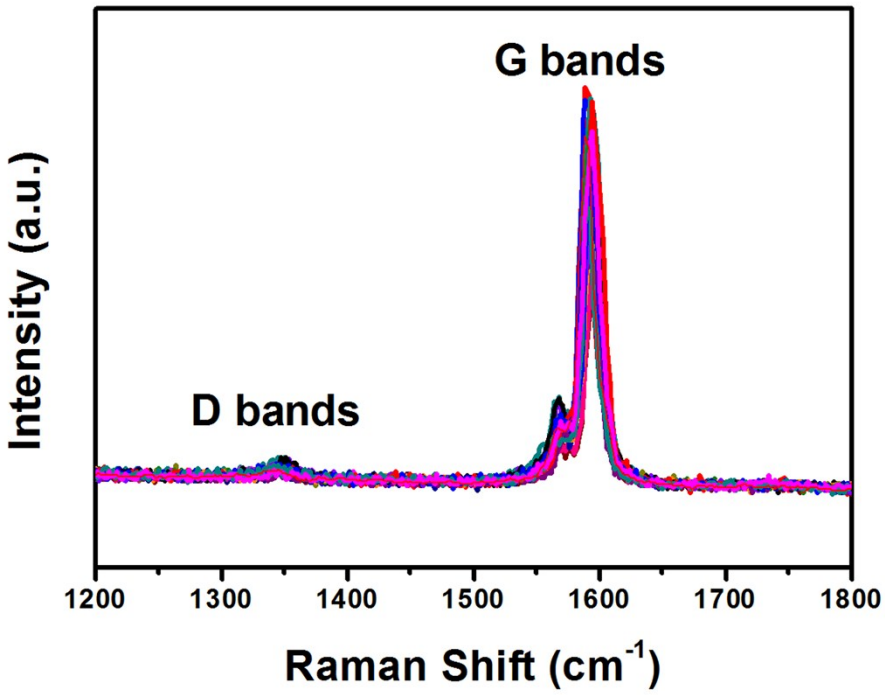

Figure S5. Typical Raman D band and G band of the as-grown SWNTS under the CVD process as described.

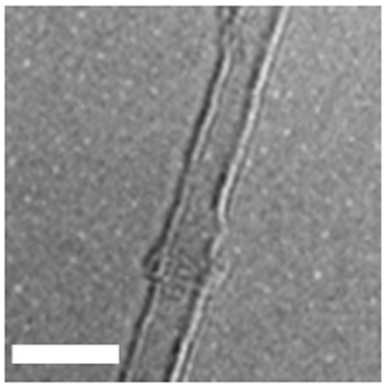

Figure S6. Typical TEM image of as-grown SWNTs. The scale bar is 2 nm.

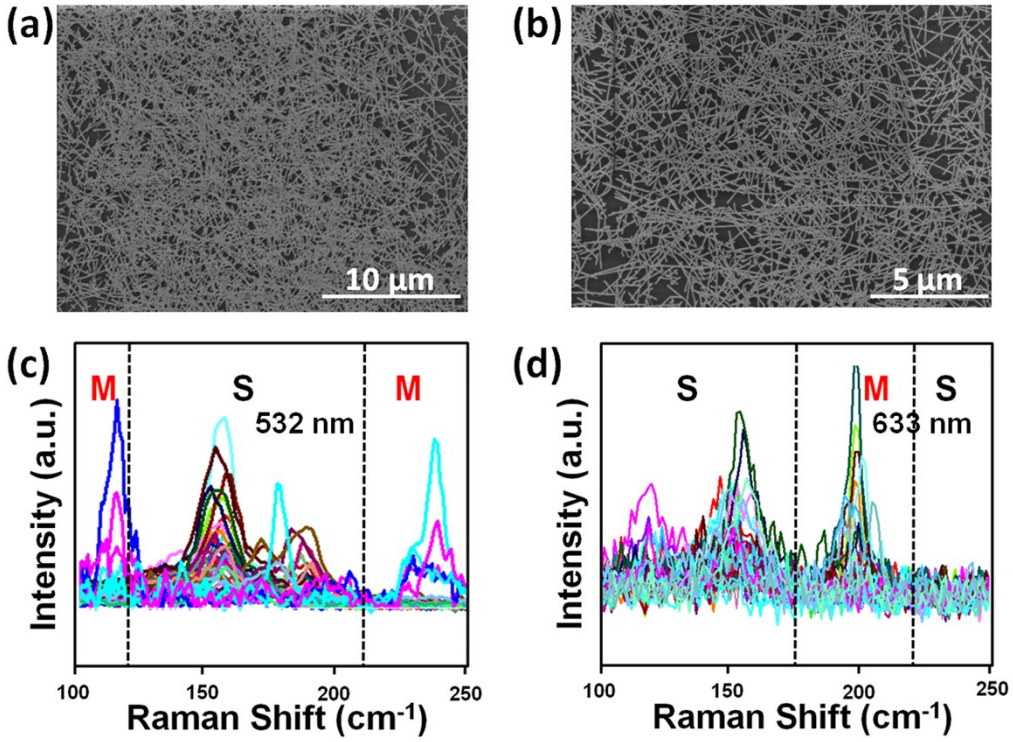

Figure S7. (a) and (b) SEM images of the SWNTs using CoPt bimetallics as catalysts; (c) and (d) RBM peaks for the as-grown SWNTs samples with 532 nm and 633 nm wavelength excitation, respectively. Peaks within the dashed zones marked with S corresponded to s-SWNTs, and M denoted m-SWNTs.

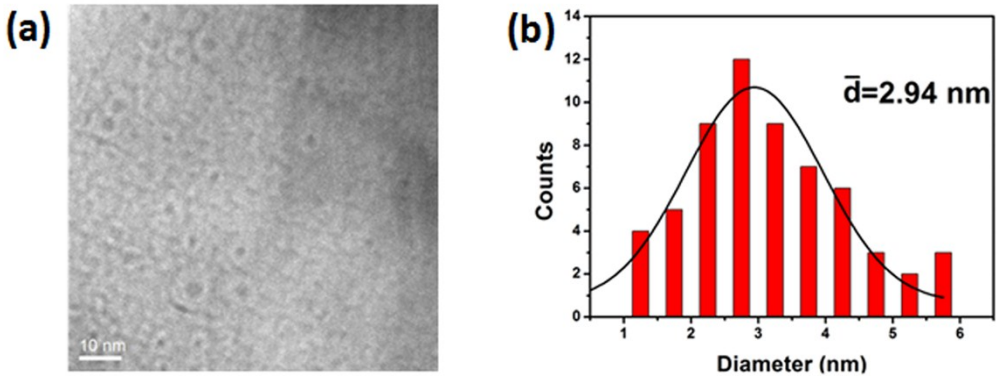

Figure S8. (a) Typical TEM image of $CoPt/CeO_2$ catalysts. (b) The histogram of the diameter for the CoPt bimetallic catalysts size. Mesoporous CeO_2 was prepared by hydrothermal method. Then, $CoPt/CeO_2$ was synthesized by impregnation method using $Co(Ac)_2{\cdot}4H_2O$ and $H_2PtCl_6{\cdot}6H_2O$ ethanol solution as catalyst precursors, mesoporous CeO_2 as the catalyst supports. The TEM image in **Figure S8b** in the revised manuscript just shows CoPt particles with average size of 2.94 nm. The background in **Figure S8a** is partial section of the CeO_2 support. The full image of CeO_2 support is displayed in **Figure S2**.

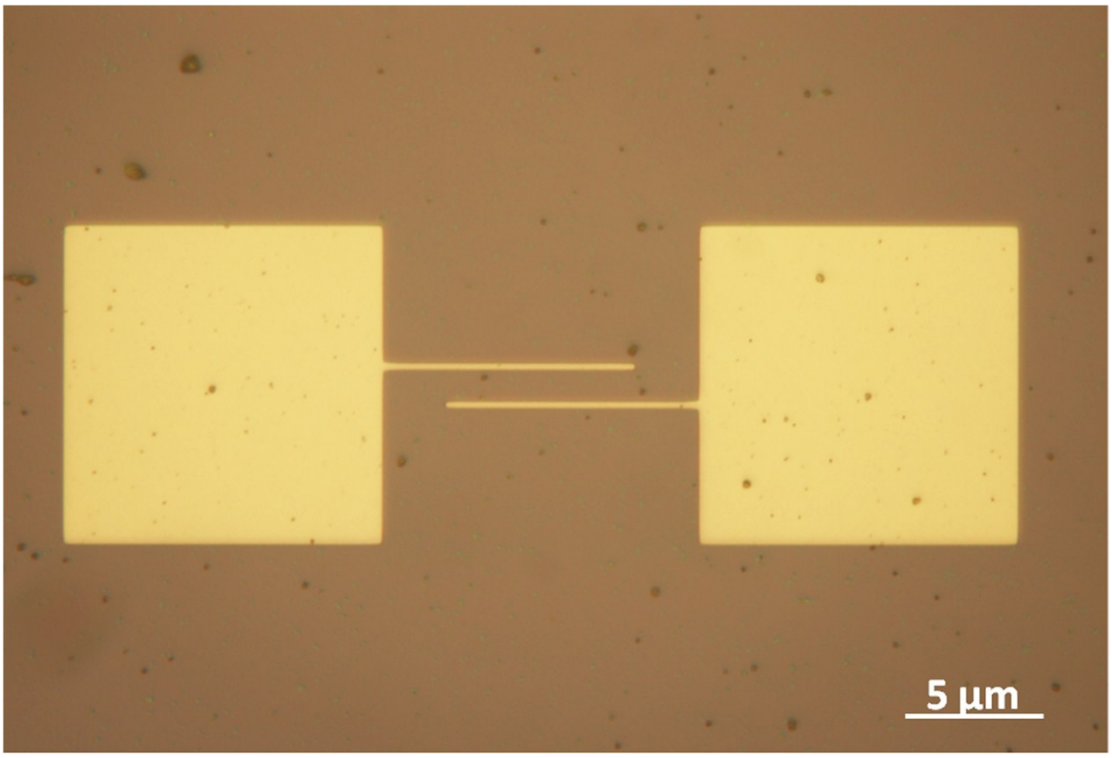

Figure S9. Typical optical microscope image of the as-fabricated FET device.

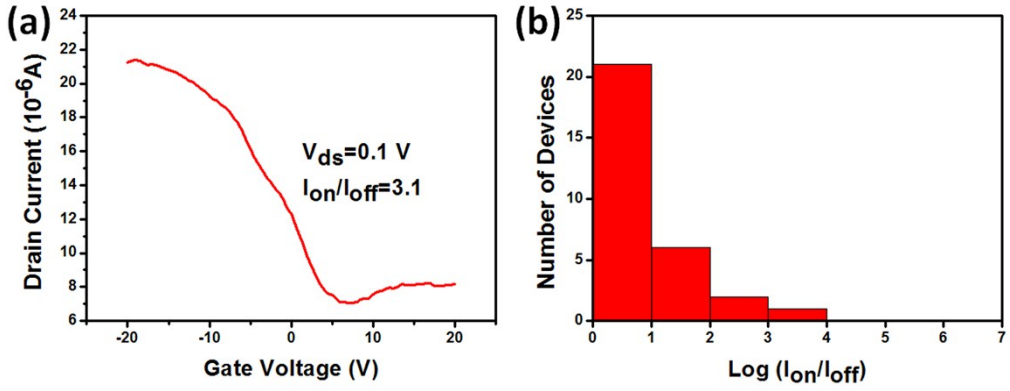

Figure S10. (a) Typical transfer characteristic curve of as-fabricated device with V_{ds}=100 mV using the as-grown SWNTs by CoPt bimetallic catalysts. (b) Histogram of the I_{on}/I_{off} ratio for as-fabricated device using the as-grown SWNTs by CoPt bimetallic catalysts.