Electronic Supporting Information

## Graphene oxide supported cobalt tungstate as catalyst precursor for selective growth of single-walled carbon nanotubes

Xue Zhao,<sup>a</sup> Xiyan Liu, <sup>a</sup> Feng Yang,<sup>a</sup> Qidong Liu,<sup>a</sup> Zeyao Zhang <sup>a,b,c,d</sup> and Yan Li <sup>\*a</sup>

<sup>a</sup> Beijing National Laboratory for Molecular Science, Key Laboratory for the Physics and Chemistry of Nanodevices, State Key Laboratory of Rare Earth Materials Chemistry and Applications, College of Chemistry and Molecular Engineering, Peking University, Beijing 100871, China.

<sup>b</sup> Peking University Shenzhen Institute, Shenzhen 518057, China.

<sup>c</sup> College of Engineering, Peking University, Beijing 100871, China.

<sup>d</sup> PKU-HKUST ShenZhen-HongKong Institution, Shenzhen 518057, China.

Corresponding authors: yanli@pku.edu.cn

## Contents

Figure S1. FT-IR spectra of GO and GO-Co <sup>2+</sup>	2
Figure S2. Characterizations of the CoWO <sub>4</sub> catalyst precursors and the as-grown SWCNTs	3
Figure S3. Characterizations of the CoCO <sub>3</sub> /GO catalyst precursors and the as-grown SWCNTs.	4
Figure S4. XRD patterns of the catalysts prepared at 1050 °C from CoWO <sub>4</sub> /GO catalyst precursors	5



The FT-IR spectra of GO and GO supported  $Co^{2+}$  (GO-Co<sup>2+</sup>) were examined (Fig. 12). The spectrum of GO illustrates C-OH at ~1379 cm<sup>-1</sup>, C-O in epoxy group at ~1073 cm<sup>-1</sup>, and C=O in carboxylic acid and carbonyl moieties at ~1733 cm<sup>-1</sup>; C=C at ~1621cm<sup>-1</sup> may be from skeletal vibrations of unoxidized graphitic domains.<sup>1,2</sup> After functionalization with Co<sup>2+</sup>, the intensity of C=O vibration band drastically decreased, while O-H, C-OH and C-O vibration bands redshifted. Furthermore, the doublet bands at ~1625 and ~1313 cm<sup>-1</sup> may correspond to the COO<sup>-</sup> asymmetric and symmetric vibrations.<sup>3</sup> These changes indicate the electrostatic and/or coordination interaction between the Co<sup>2+</sup> and the oxygen-containing groups of the GO sheets, and then CoWO<sub>4</sub> nanoparticles were formed on GO due to the anchoring of Co<sup>2+</sup>.



**Fig. S2** Characterizations of the CoWO<sub>4</sub> catalyst precursors and the as-grown SWCNTs. (a) TEM image of the CoWO<sub>4</sub> catalyst precursors. (b) SEM image and (c) typical Raman spectra of the as-grown SWCNTs. (d-f) Raman spectra of the as-grown SWCNTs, excitation: (d) 532 nm, (e) 633 nm and (f) 785 nm.



**Fig. S3** Characterizations of the CoCO<sub>3</sub>/GO catalyst precursors and the as-grown SWCNTs. (a) TEM image of the CoCO<sub>3</sub>/GO catalyst precursors. (b) SEM image of the as-grown SWCNTs. (ce) Raman spectra of the as-grown SWCNTs, excitation: (c) 532 nm, (d) 633 nm and (e) 785 nm.



**Fig. S4** XRD patterns of the catalysts prepared at 1050 °C from  $CoWO_4/GO$  catalyst precursors (black line). Standard cards of  $Co_7W_6$ , W and  $SiO_2$  from the database are also shown.

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