Supplementary information

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Carbon nanotubes as support of cobalt catalysts for methane CVD towards carbon nanotubes

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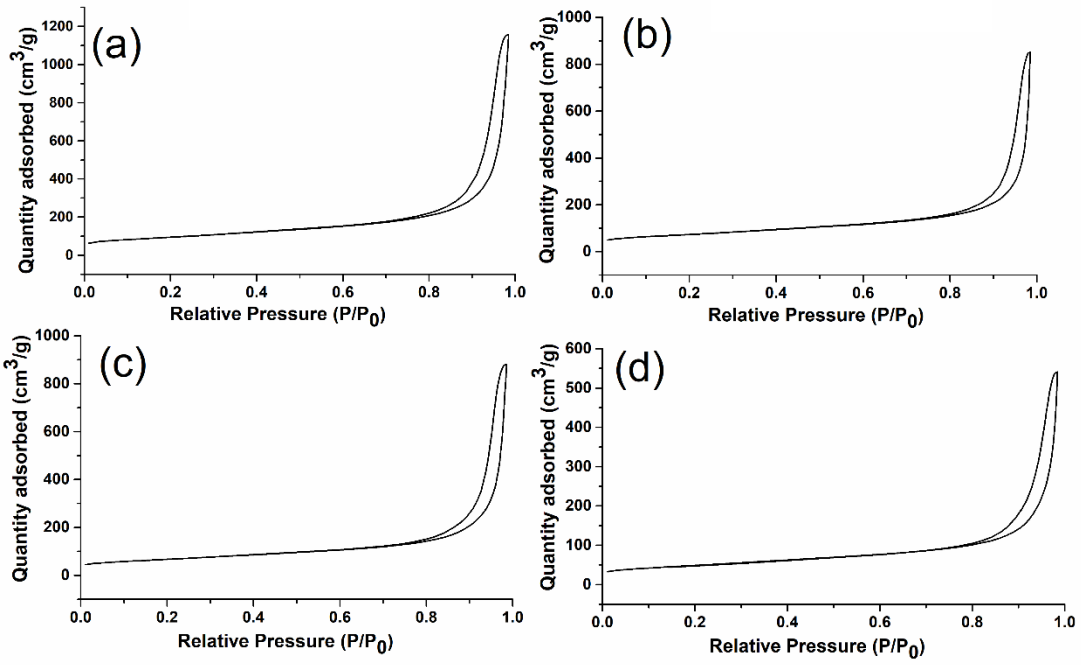

Fig. S1- N_2-adsorption–desorption isotherms of Co/CNT_s catalysts: (a) $10Co/CNT_{s\_IMP}$; (b) $10Co/CNT_{s\_WI}$; (c) $20Co/CNT_{s\_IMP}$ and (d) $20Co/CNT_{s\_WI}$.

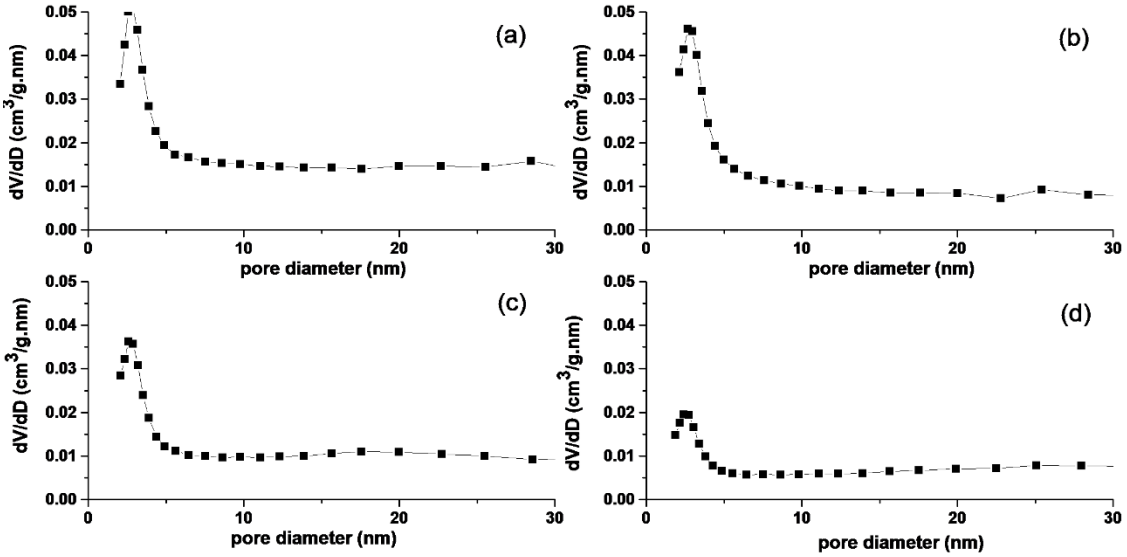

Fig. S2- Pore size distribution of Co/CNT_s catalysts: (a) 10Co/CNT_{s_IMP}; (b) 10Co/CNT_{s_WI}; (c) 20Co/CNT_{s_IMP} and (d) 20Co/CNT_{s_WI}.

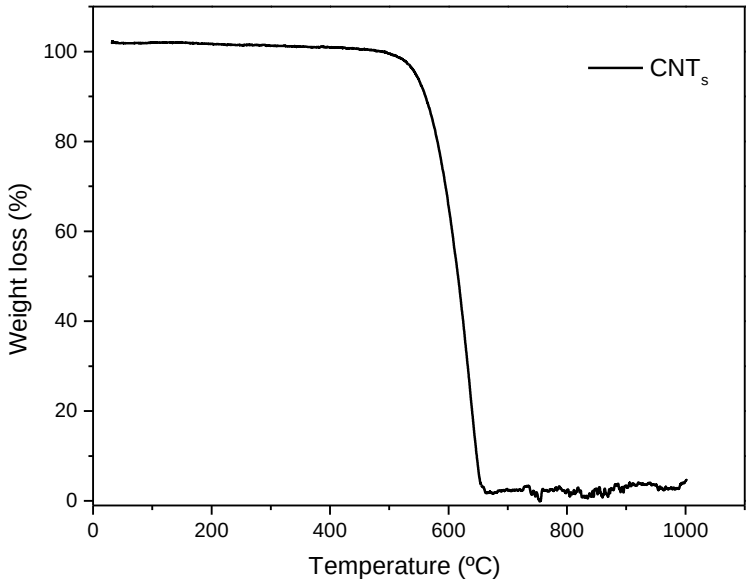

Fig. S3- TGA thermogram of CNT_s

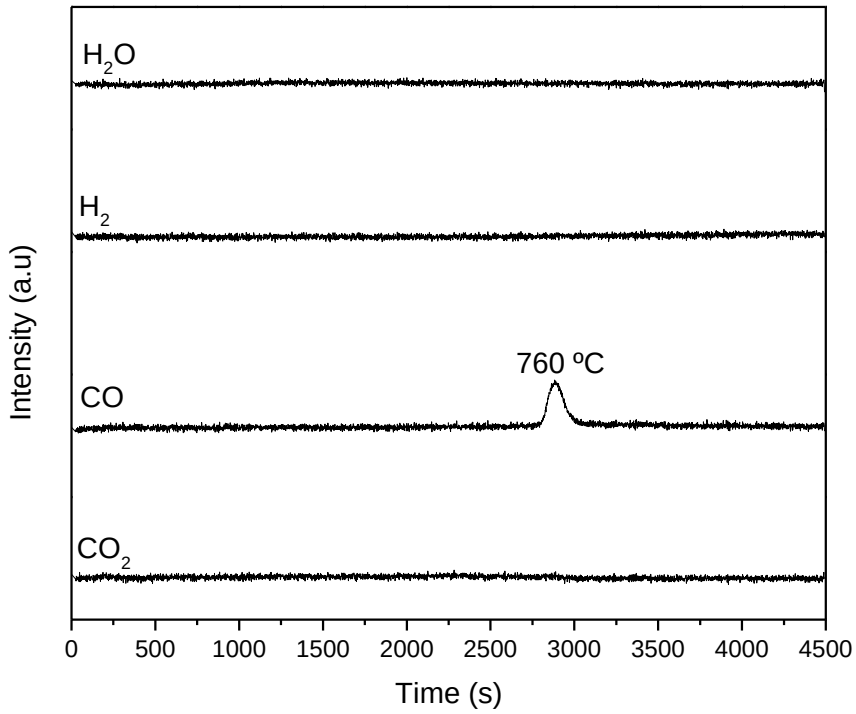

Fig. S4-Stability test of the CNTs in Helium atmosphere.

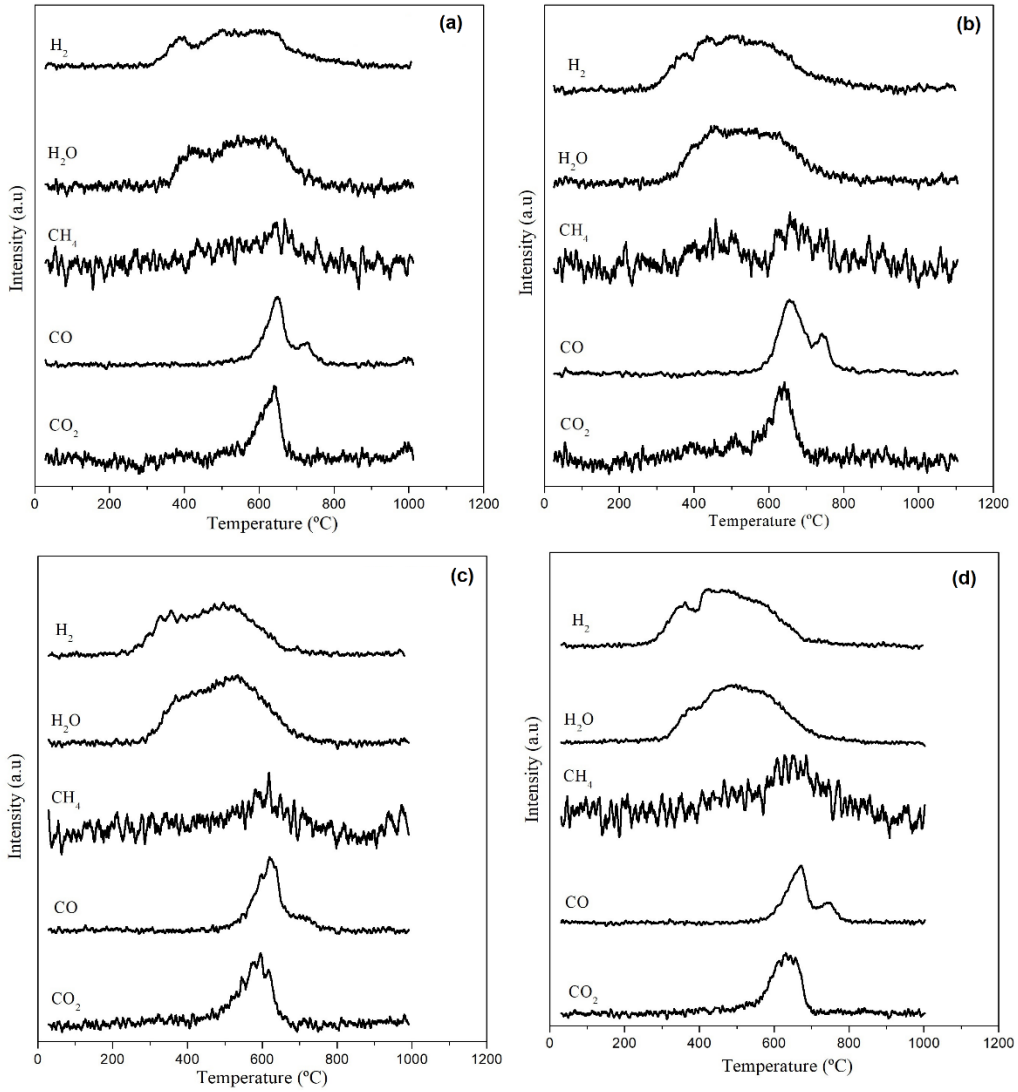

Fig. S5- Detailed TPR profiles of Co/CNT_s catalysts: (a) $10Co/CNT_{s\_IMP}$; (b) $10Co/CNT_{s\_WI}$; (c) $20Co/CNT_{s\_IMP}$ and (d) $20Co/CNT_{s\_WI}$. The H_2 profile corresponds to hydrogen consumption (m/q=2) and the other profiles to the formation of those components (m/q = 16 (CH_4), 18 (H_2O), 20 (CO) and 44 (CO_2) signals.

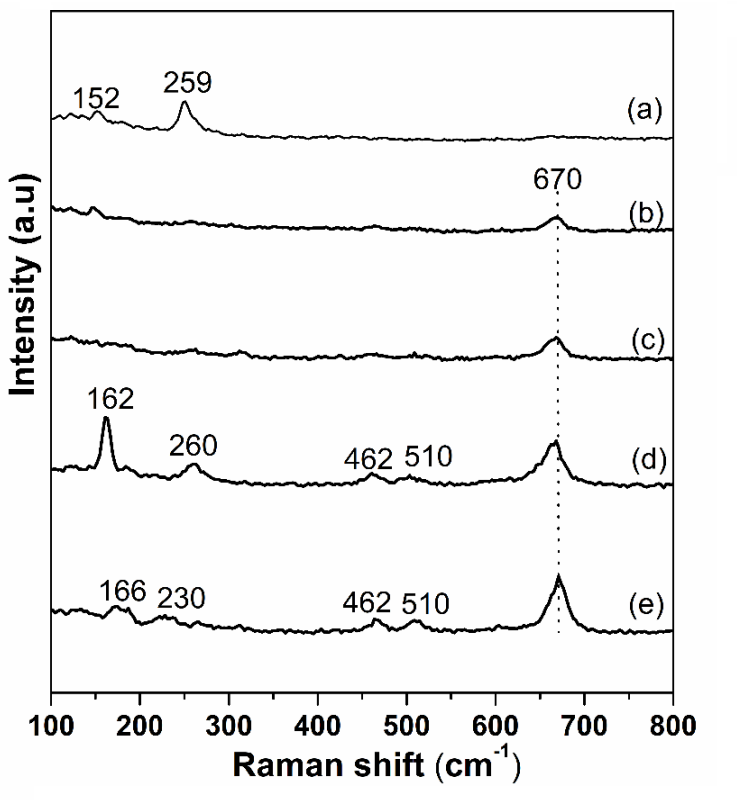

Fig. S6- Raman spectra of CNT_S and Co/CNT_S supported catalysts: (a) CNT_S; (b) $10Co/CNT_{S\_IMP}$; (c) $10Co/CNT_{S\_WI}$; (d) $20Co/CNT_{S\_IMP}$ and (e) $20Co/CNT_{S\_WI}$.

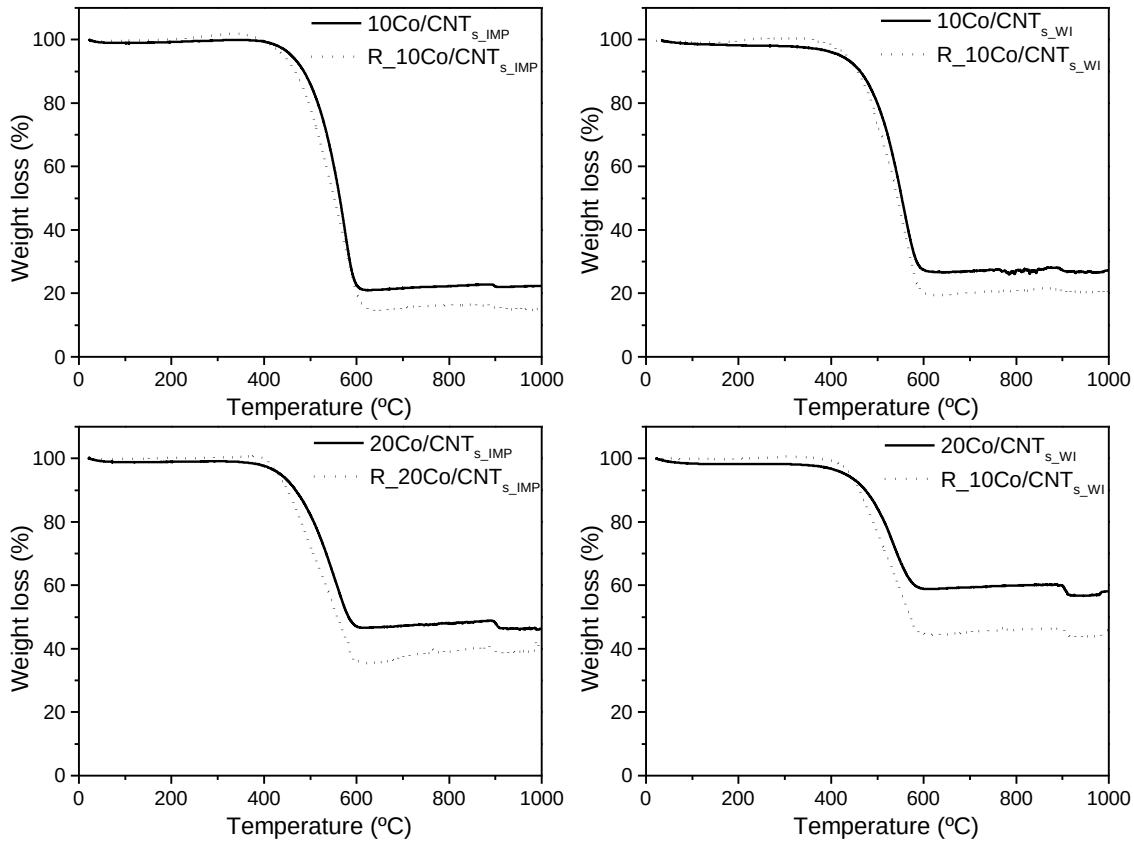

Fig. S7-TGA curves of Co/CNT$_s$ catalyst before and after methane CVD.

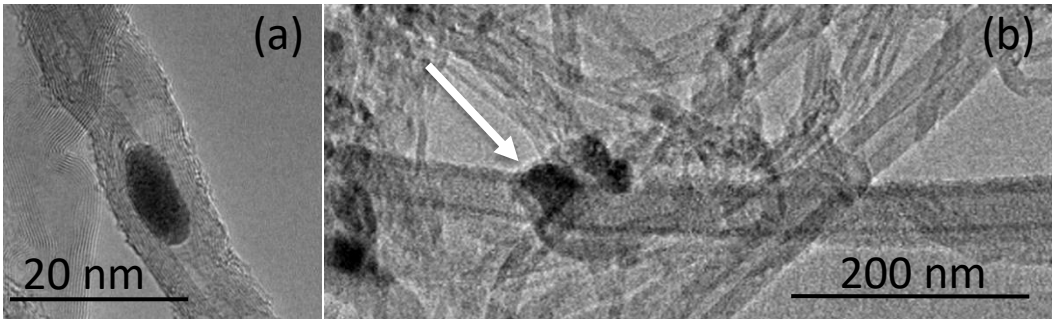

Fig. S8- TEM images: (a) Particle small than the inner diameter of the nanotube and centered along the axis of the tubes with the wall taking the same shape of the particle; (b) Particle larger than the inner diameter of the nanotube and decentralized.