

## Supplementary Information

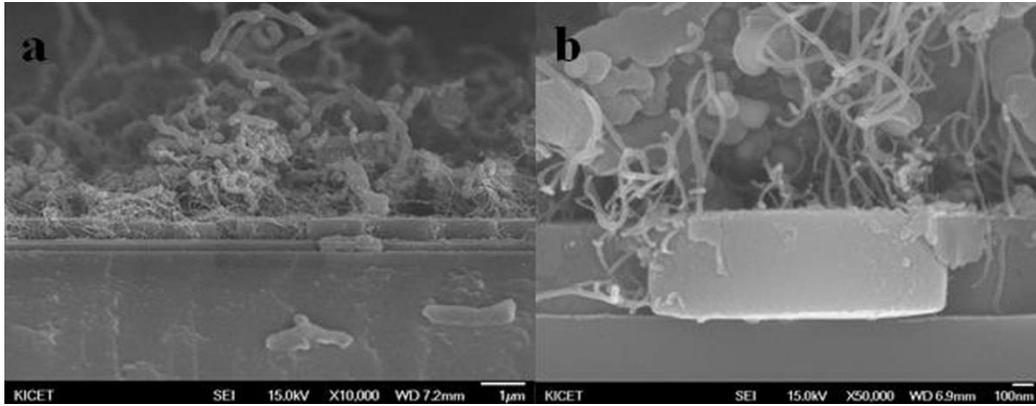


Fig. S1 SEM images of CNTs synthesized from radio-frequency sputtered  $\text{Fe}_2\text{O}_3$  film on the Z/Si: (a) view of large area, and (b) view of local area.

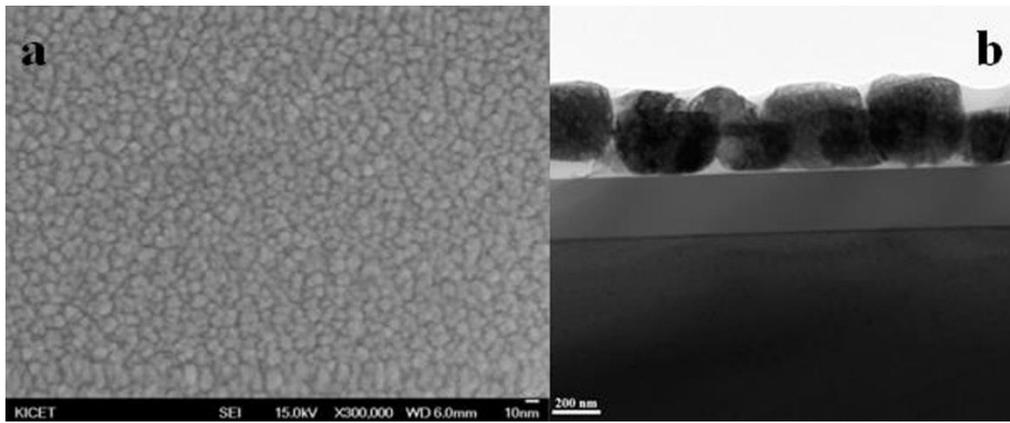


Fig. S2 (a) SEM image and (b) TEM image of radio-frequency sputtered  $\text{Fe}_2\text{O}_3$  film on the Z/Si.