

All carbon nanotube based flexible field emission devices prepared through a film transfer method

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Supplementary material

The TEM image showed in Fig. 1s demonstrates the SWCNT with single walled tube and a diameter of ~ 2 nm.

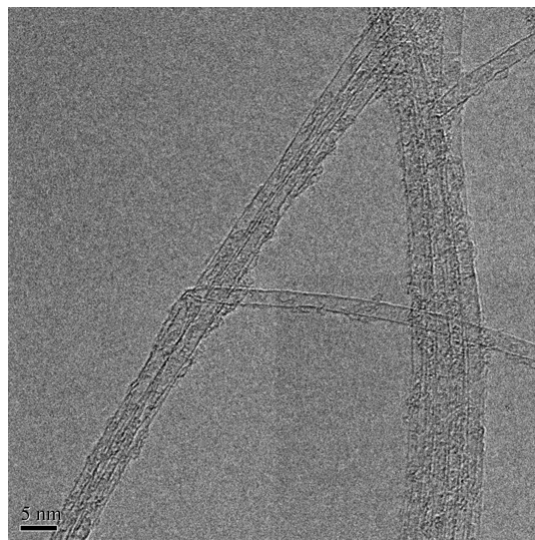


Fig. 1s. TEM image of SWCNT

Figure 2s showed the FTIR spectra of SWCNT and DWCNT. The samples of origin CNT film represent CNTs without any treatment while CNT films mean the vacuum filtered CNT films which were used as field emission electrodes in our experiment. Comparing with the origin CNT and CNT film, there are no other peaks appeared after vacuum filtering in both FTIR spectra of SWCNT and DWCNT, which hints no organic binders bringing by the vacuum filtering method.

Fig. 2s. FTIR spectra of SWCNT and DWCNT

TG analysis method is effective for metal catalyst analysis. From the TGA of SWCNT and DWCNT, the mass of both two samples did not change before 270 °C, which reveals no organic binders remained on CNT surface. Because sodium dodecyl sulfate (SDS) used as surfactant in our experiment will decompose while temperature exceeds 180 °C. The reducing in mass from the temperature of 270 to 460 °C may be caused by the burning of amorphous carbon. Beside, after 600 °C for SWCNT and 770 °C for DWCNT, the residuals are metal oxides, which demonstrates the existence of catalyst nanoparticles.

Fig. 3s. TGA of SWCNT and DWCNT