Chapter 9

Future Prospects

For carbon nanotubes field emission displays' application, the further research topics are proposed as follows.

(1) Low temperature growth (below 450°C) of carbon nanotubes using binary alloys of Fe, Co, Ni, Pd, Cr….

(2) Pre-treatments of metal catalyst before CNTs' growth for density control of carbon nanotubes. For example: partial oxidation of catalyst, laser pre-treatment…..

(3) Post-treatment of carbon nanotubes such as other gas plasma post-treatment, laser irradiation and rapid thermal annealing to reduce the density of carbon nanotubes.

(4) Post-treatment of carbon nanotubes to improve the crystallization of carbon nanotubes grown under low temperature.

(5) Nano-imprint of well crystallization carbon nanotubes to avoid direct low temperature growth of carbon nanotubes.

(6) Demonstration of a diode/triode field emission display of small dimension.

(7) Explore the technologies of CNTs backlight unit.

For the applications in vacuum microelectronics, the further research topics are proposed as follows.

(1) Fabrication of CNTs lateral field emission diode/triode for high frequency and

high power circuit applications.

(2) Vacuum sealed of LFED for practical application.

(3) Fabrication of CNTs gas sensor.

For the applications of CNTs in nano-electronis, the further research topics are proposed as follows.

(1) Find the stable growth process for high yield growth of single wall carbon nanotubes (SWNT).

(2) Find the growth condition of real lateral growth of SWNT.

(3) Fabrication of CNTFET.