

The field emission property of carbon nanotube and ITO composites formed by chemical etching process

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The carbon nanotube field emission devices have been developed, but stability and uniformity was not complete. In order to enhance the emission stability and uniformity, ITO and carbon nanotube composites were developed by increasing adhesion force between the substrate and carbon nanotubes. Single wall carbon nanotubes were synthesized on ITO glass substrates by in-situ arc-discharge method and temporary junction characteristic of carbon nanotubes and substrate was improved by ethanol treatment. The single wall carbon nanotubes have been purified by thermal oxidation and chemical wet etching processes. The ITO electrode was damaged and agglomerated with carbon nanotubes after wet etching processes. The field emission property and stability of carbon nanotubes into the ITO films have been characterized into the UHV chamber. The turn voltage was about 2 V/ μm . The maximum current density was about 1 mA/cm² at 4 V/ μm of electric field. The 30 % of current density decreasing have been observed for 10 hours.