

Transparent carbon nanotube field emission devices for field emission display and lamp

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A simple new method to fabricate transparent carbon nanotube field emission devices was developed. The highly graphitized single wall carbon nanotubes were attached on Sn/ITO glass by arc discharge method. Post heattreatments below the deformation temperature of soda-lime glass guaranteed a good mechanical adhesion and electrical contact of the nanotubes. The Sn layer was oxidized below 400°C and became transparent. The oxidation process was held at air ambient pressure. The emission current density of heat treated single wall carbon nanotube and Sn metal composites was about 1 mA/cm² at 3V/μm of electric field. The emission current densities of oxidized single wall carbon nanotube and SnOx composites were also about 1 mA/cm² at same electric field. As increasing the oxidation temperatures, the emission properties became stable and life time of emitter has been increased.

Keywords: Carbon nanotube, Field emission device, Carbon nanotube composites, SnOx