The Effects of Potassium Hydroxide Post-Treatments on Field Emission Properties of Thermal Chemical Vapor Deposited Carb

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ABSTRACT

In this work, A simple potassium hydroxide (KOH) treatment method was applied to functionalize the surface and to modify the structures of multi-walled carbon nanotubes (CNTs) grown on silicon substrates by thermal chemical vapor deposition (thermal CVD). Scanning electron microscopy (SEM), transmission electron microscopy (TEM), Raman spectroscopy, and energy dispersive spectrometer (EDS) were employed to investigate the mechanism causing the modified field emission (FE) properties of the CNTs. From our experimental data, it is found that after KOH treatment the emitted currents were enhanced by more than one order of magnitude compared with those of the untreated CNTs. The emitted current density of CNTs increases from 0.44 mA/cm2 to 7.92 mA/cm2. after 30 minutes of KOH solution treatment. This method provides a simple, economical, and effective way to enhance the CNT field emission properties.

Keywords : carbon nanotubes (CNTs)、emitted currents、thermal chemical vapor deposition (thermal CVD)

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