

Carbon nanotube / silane hybride film for highly efficient field emitter

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Abstract : Few-walled carbon nanotubes (FWNTs)-based field emitters with long term stability are fabricated by using a spray method. Tetraethylorthosilicate (TEOS) sol as a binder was mixed with dispersed solution of FWNTs to enhance the adhesion of FWNTs on the cathode substrate. Due to the strong intermolecular interaction of TEOS to the functional groups attached on CNTs and substrate, CNTs are tightly adhered to the cathode electrode when heat treatment is performed at 150°C for 1 hour, resulting in a stable electron emission of CNT emitters for long time. Excellent field emission characteristics were exhibited, with a large field enhancement factor and low turn-on voltage, comparable to those of CNT emitters fabricated by a screen printing of CNT paste. Therefore, FWNTs / TEOS hybrid films could be utilized as an alternative for the efficient and reliable field emitters.

Key words: CNT, field emitter, spray coating

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