

Preparation and characterization of nanostructured composite films for organic light emitting diodes

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Abstract: With the aim to improve the photonic efficiency of an organic light emitting diode (OLED) and its display duration, both the hole transport layer (HTL) and the emitting layer (EML) were prepared as nanostructured thin films. For the HTL nanocomposite films were prepared by spin coating solutions of poly(vinylcarbazole) (PVK) and PEDOT-PSS containing TiO_2 nanoparticles onto low resistivity ITO substrates; for the EML, TiO_2 -embedded MEH-PPV (MEH-PPV+nc- TiO_2) conjugate polymers were spin-coated onto the HTL. OLEDs prepared from above mentioned films have the structure of multilayers such as Al/MEH-PPV+nc- TiO_2 /PVK+nc- TiO_2 /ITO and Al/MEH-PPV+nc- TiO_2 /PEDOT-PSS+nc- TiO_2 /ITO. Characterization of the nanocomposite films showed that both the I-V characteristics and the photoluminescence spectra of the nanocomposite materials were significantly enhanced in comparison to the standard polymers. © 2009 IOP Publishing Ltd.

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