

INFLUENCE OF TETRABUTYLAMMONIUM HEXAFLUOROPHOSPHATE (TBAPF6) DOPING ON THE PERFORMANCE OF POLYMER LIGHT EMITTING DIODES (PLEDs) BASED ON PVK:PBD BLEND FILMS

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ABSTRACT

The effect of tetrabutylammonium hexafluorophosphate (TBAPF₆) doping on the electrical and electroluminescence properties of single-layer polymer light emitting diodes (PLEDs) with ITO/PVK:PBD/Al structure were investigated where indium tin oxide (ITO) was used as anode, poly(9-vinylcarbazole) (PVK) as polymeric host, 2-(4-biphenyl)-5-phenyl-1,3,4-oxadiazole (PBD) as electron-transporting molecule and aluminium (Al) as cathode. The emitting layers were spin-coated onto the ITO-coated glass substrates. It was found that the doped devices underwent transition at the first voltage scan where the current increased drastically at certain voltage. After the transition, the threshold voltage for current injection as well as the light emission decreased significantly as compared to undoped device. The turn on voltage of the doped device was 5 V. The significant improvement was attributed to the reduction of both electron and hole injection energy barriers caused by accumulation of ionic species at the interface. In conclusion, doping of TBAPF₆ has been shown to be a valuable approach to reduce the turn-on voltage and increase the EL intensity of PLEDs.

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