

Supporting Information

White Light Emitting Diodes Based on A Yellow Thermally Activated Delayed Fluorescent Emitter and Blue Fluorescent emitter

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Experimental Methods

Materials. TXO-TPA was synthesized as reported previously. The hole-injection materials of poly(styrene sulfonic acid)-doped poly(3,4-ethylenedioxythiophene) (PEDOT:PSS, Baytron PVP A4083) was purchased from H.C. Starck GmbH. The hole transporting material of 1,1-bis[(di-4-tolylamino)phenyl] cyclohexane (TAPC), the electron-transporting materials of 1,3-bis[(4-tert-butylphenyl)-benzene (TmPyPB), the blue fluorescent emitter of N,N'-di-1-naphthalenyl-N,N'-diphenyl-[1,1':4',1'':4'',1''']-

quaterphenyl]-4,4''-diamine (4P-NPB) and the host material of 1,3-Bis(carbazol-9-yl)benzene (mCP) was purchased from Jilin Optical and Electronic Materials Company, which were purified by repeated temperature-gradient vacuum sublimation and received with a purity of more than 99%. LiF was purchased from Sigma-Aldrich.

Device Fabrication. OLEDs were fabricated on patterned ITO-coated glass substrates with a sheet resistance of $15 \Omega/\square$. Before device fabrication, the ITO glass substrates were ultrasonically cleaned with detergent, de-ionized water, acetone, and alcohol. After that, the substrates were dried in an oven at 120°C and then treated with UV-ozone for 10 mins. A layer of 30 nm thick PEDOT:PSS was spin-coated onto the precleaned substrate and bake in a glovebox under a nitrogen environment (oxygen and water contents less than 1 ppm) at 120°C for 30 mins to extract residual water. Afterward, the substrates transferred to a vacuum deposition system with a base pressure better than 1×10^{-6} mbar for organic semiconductor layers and metal deposition. The devices were fabricated by evaporating organic semiconductors onto the PEDOT:PSS layer sequentially with an evaporation rate of $1\text{--}2 \text{ \AA/s}$. The cathode was completed through thermal deposition of LiF at a deposition rate of 0.1 \AA/s , and then capped with Al metal through thermal evaporation at a rate of 10 \AA/s .

Measurements. UV-vis spectra and fluorescence spectra were obtained with Hitachi U-3900 and F-4600 spectrophotometers, respectively. The thickness of evaporated films were monitored by frequency counter, and calibrated by Dektak 6M Profiler. The EL luminescence spectra and CIE color coordinates were measured by a Spectrascan PR655

photometer. The current-voltage-brightness characteristics were measured by using a computer-controlled Keithley source measurement unit (Keithley 2400 SourceMeter) with a calibrated optical power meter of Newport company (1936R) under ambient atmosphere.