

WHITE LIGHT FROM A SINGLE-DOPANT BASED ON POLY (9,9-DI-NHEXYLFLUORENYL- 2,7-DYL), PHF DOPED WITH RUBRENE

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ABSTRACT

OLED devices with the structure of ITO/PHF:rubrene/Al have been fabricated, where PHF is poly(9,9-di-n-hexylfluorenyl-2,7-diyl) and rubrene is 5,6,11,12-tetraphenylnaphthacene. PHF is used as blue light emitting host and rubrene as an orange dye dopant. The devices were fabricated with a variations of PHF and rubrene concentration to obtained an optimum white light. The PHF doped rubrene thin films were deposited using spin coating technique. The performance of the devices was determined from measurement of CIE coordinate, current-voltage curve, and brightness. The results showed that the combination of 0.6 wt% PHF and 0.06 wt% rubrene produced the optimum white light at CIE coordinate of (0.30,0.33). The standard coordinate for white light is (0.33, 0.33). The turn-on voltage of this device is 14.0 V and the brightness is 6583 cd/m². In order to reduce the turn-on voltage, the devices were annealed at variation temperatures of 50°C, 100°C, and 150°C. The best annealing temperature is 150°C where it successfully reduced the turn-on voltage to 8.0 V and increased the brightness to 9042 cd/m².

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