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A Tunable Emission Prepared by Novel Photo-induced Color-Change Materials

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1. Introduction

White organic light emitting diodes (WOLEDs) are find a exclusive of great interest for their applications on such as full color displays , backlight of liquid crystal displays, and illumination light their panel fabrications are also presented.[1-3]The organic light emitting diode(OLED) is known to be a very attractive candidate for display devices as well as other applications. Various methods have been developed to produce thin film attach to Color-change materials. We can found Organic Dye (C545) that dopent in SU8 developed to produce white light emission, including the with UV exposure. After exposure the SU8 will reduce three-wavelength WOLED with primary colors (red, green, blue; RGB) from respective layers in a multilayer structure, or two-wavelength WOLED by mixing a blue host with an appropriate amount of yellow or orange dopant in a single emissive layer etc. [4-6]. Among them ,Use a single blue layer of PLED back-light is simpler than three-wavelength one in device structure design and fabrication processes. However , we studied a green emitter (C545T) dopanted SU8.Organic phosphor , belongs to high fluorescence [10-(2-benzothiazolyl)-1,1,7,7-tetramethyl-2,3,6,7-tetra hydro-1H,5H,11Hbenzo[l]-pyrano[6,7,8-ij]quinolizin-11 one (C545T)]

2. Experimental

The device configuration of the three-wavelength WOLED consisting of Blue PLED (Ploymer Light Emitting Diode):(LiF/Ca/Al)/BP105 / PEDOT : PSS / ITO glass /L1(C545T-G) / L2(C545T-R)/Glass that were used as raw materials ,was shown in Fig. 1. The Color materials layer used in this work .The L1 layer which C545T of raw compounds is mixed according to SU8 without UV exposure .The L2 layer which C545T of raw compounds is mixed according to SU8 with UV exposure Fig. 2 shows the PL spectrum of the devices with different concentration of Emission (C545T dopanted in SU8 : 250-750P.P.M) thin film-exposure and blue light-emission (483nm). Before the device fabrication , the ITO glass was cleaned using ultrasonic baths of isopropyl alcohol and acetone. Organic layers were thin film by Spin Coater The Photoluminescence (PL) spectrum and CIE coordinates of the devices were measured using the PR650 (spectroscan spectrometer) with Blue-PLED light source. All measurements were carried out at room temperature under ambient condition[7-8]

Thin films	Abs λ max	Emission λ max
L1	483nm	525nm
L2	540nm	580nm

Table1.Absortpon and Emission λ max of the C545T disperser thin films:Without UV exposure.(a) L1: before expo sure (b) L2: after exposure

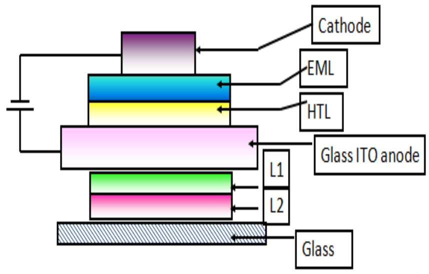

Fig.1 BLUE-PLED Device configuration of the color-change Materials

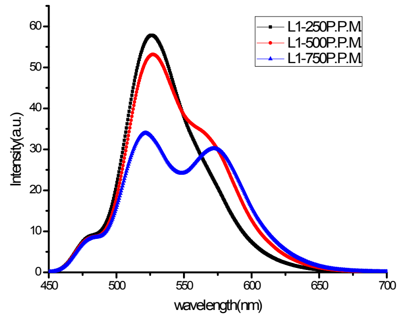

Fig.2 The PL spectra of device with different concentration of color-change materials without exposure(Absortpon light 483 nm)

3.Results and Discussion

When the sample of C545T and SU8 with thin films were exposured to UV-light. We can find that the thin film between without UV exposure (L1-Green) and with UV exposure (L2-Rad) will show the different chemistry properties. We can achieve proper CIE coordinates and color by adjusting .The different concentrations of C545T dopanted in SU8 thin films. The L1 and L2 were close-kint blue back-light in order to achieve a tunable emission module . If we crafted meticulously optimization , we can find a exclusive white light. The corresponding, white-light illumination characteristics of WOLEDs and their panel fabrications are also presented. This is a optic thin film attach to Color-change materials. We can found Organic Dye (C545T) that dopent in SU8 with UV exposure at I-line 365nm.After exposure the SU8 will to produce photo-acid that can combine with C545T. The emission of L2 layer will wave of red shift .L1 and L2 that absortpon and emission were shown in Table 1.The PLED in blue-backlight emission a 483nm. From Fig.3 and Fig.4 we observed the consistence that our optimal WOLED could exhibit a pretty stable white-light CIE coordinates performance for operating at a wide range of current densities (14 ~ 18V). Besides .when L1 (C545T-750P.P.M) in SU8 without exposure) + L2(C545T-2000P.P.M exposure) at V=16 an optimal white-light emission with a standard CIE values of x = 0.334, y = 0.348 could be obtained.[9-11]

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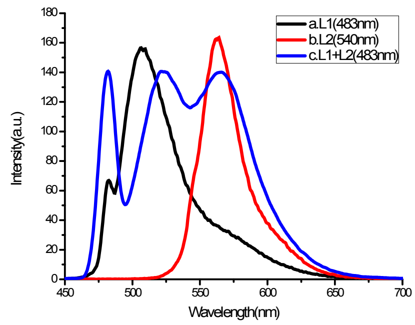

Fig.3 PL Emission spectra of L1、L2、L1+L2
Absortpon light (a)540nm(b,c)483nm

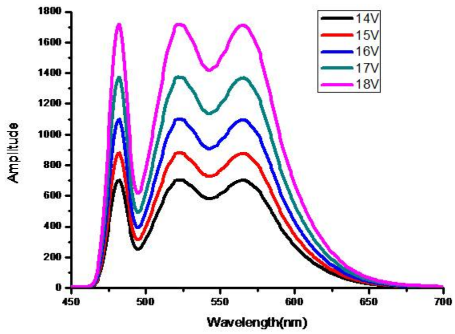

Fig.4 C.I.E of WPLED at Voltage (14~18V)

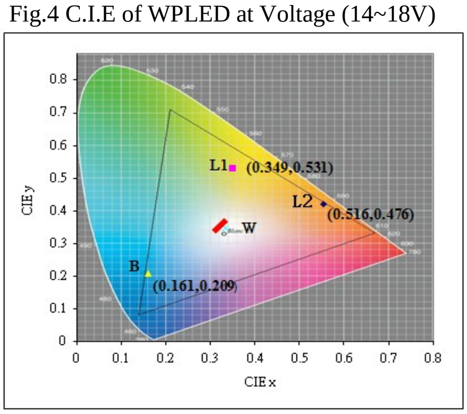

Fig.5 C.I.E coordinates of L1、L2 、WPLED at Voltage(14-18V)、B(PLED)

4. Conclusion

In summary , we use Organic phosphor coumarin-C545 T was mixed in SU8 and used to Polymer blue light-emitting diode (PLED). As the weight ratios of C545T to SU8 were different concentration, . When the sample of C545T and SU8 with thin films were exposured to UV-light. We found that the thin film between with UV exposure (L1-Green) and without UV exposure (L2-Rad) will show the different chemistry properties. We can achieve proper CIE coordinates and color by adjusting .The different concentrations of C545T dopanted in SU8 thin films .The L1 and L2 were close-kint blue back-light in order to achieve a tunable emission module . If we crafted meticulously optimization , we can find a exclusive white light.(Please see Fig.5). As result .Organic thin film was confirmed that this technology draws out the Potential of the TFT-LCD and OLED display .This is a optic thin film attach to Color-change materials. [12-15]

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