Supporting information

Color Tuning inInverted Blue Light-EmittingDiodesBased on Polyfluorene Derivative by Adjusting the Thickness of Light-Emitting Layer

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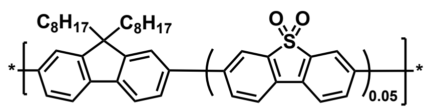
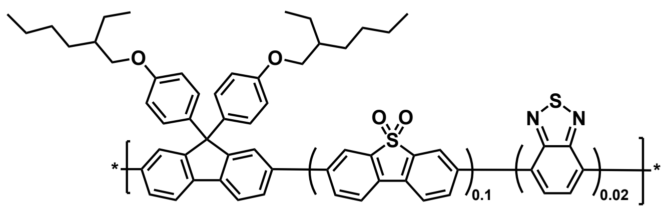
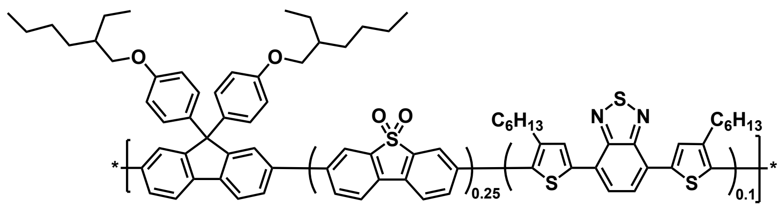


PF-FSO5



PPF-FSO10-BT2



PPF-FSO25-DHTBT10

Fig.S1. Chemical structures of RGB light emitting polymers PF-FSO5(B), PPF-FSO10-BT2(G) and PPF-FSO25-DHTBT10(R).

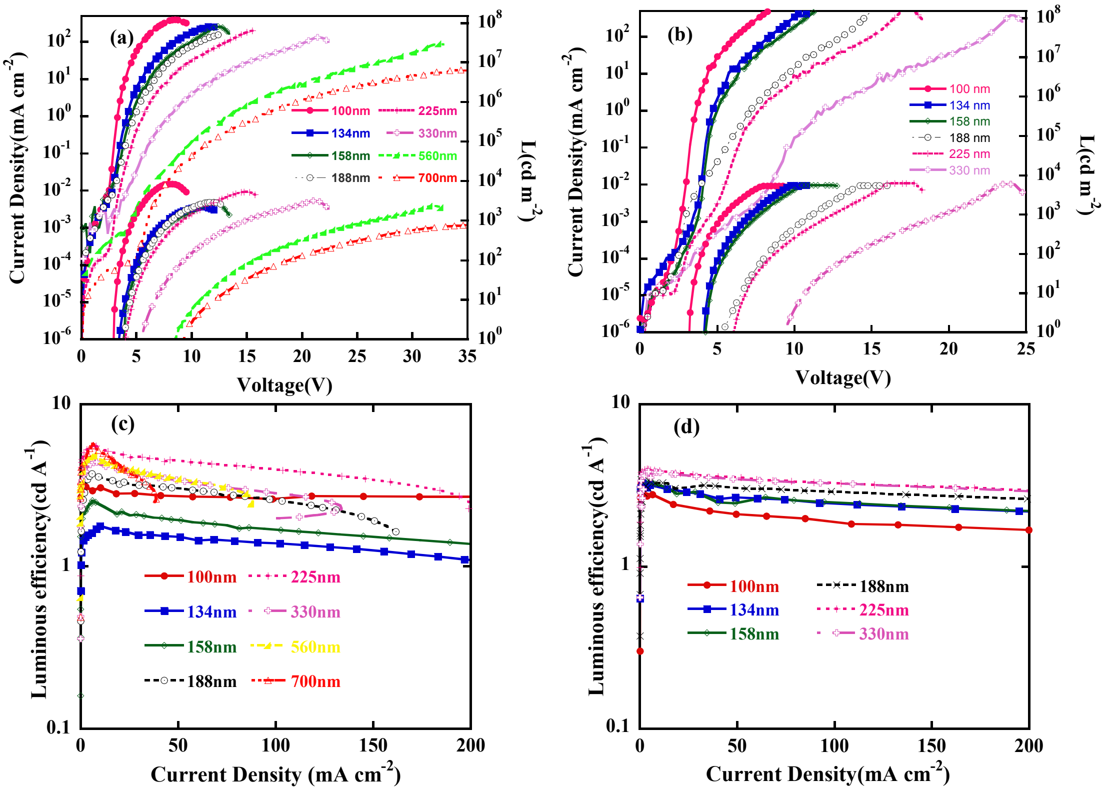


Fig.S2. J-V-L and J-LE characteristics of IPLEDs (a,c) and CPLEDs (b,d) with the different emissive layer's thickness of PF-FSO10.

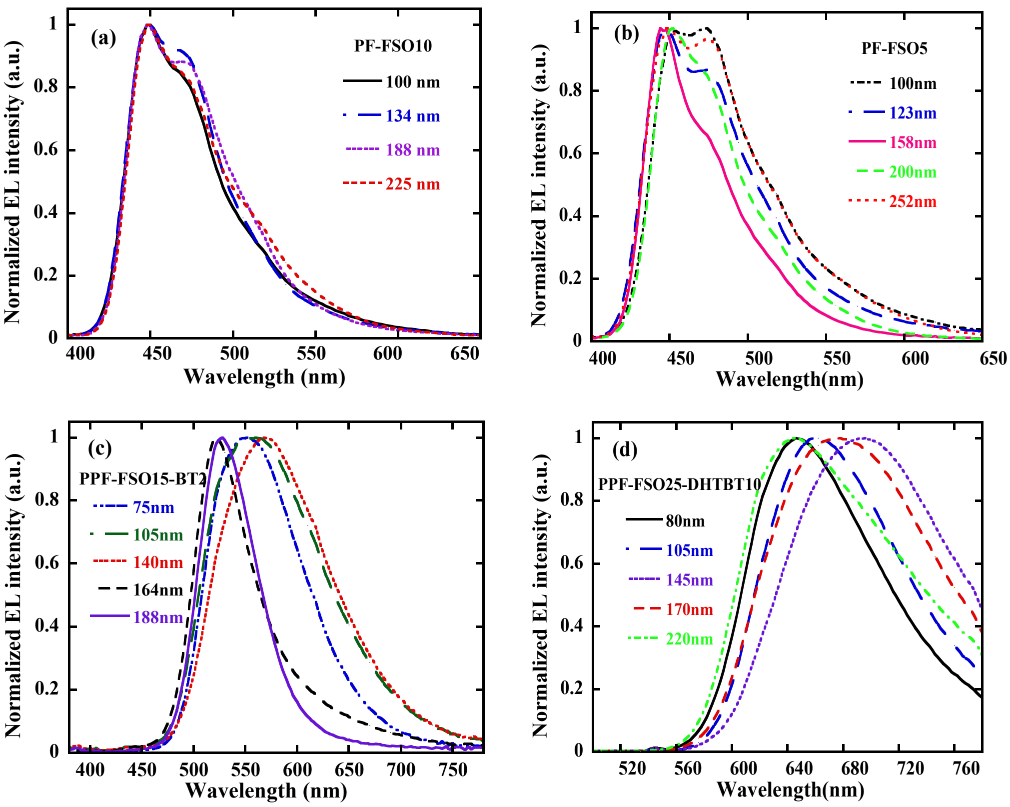


Fig.S3. EL spectra of PF-FSO10 in the CPLEDs(a), and PF-FSO5(b), PPF-FSO10-BT2(c) and PPF-FSO25-DHTBT10(d) in the IPLEDs with the different thickness of emissive layer.

Optical interference

Optical path is the product of the geometric distance which light go through medium and refractive index of that medium. Namely,

$L = nd$

L: optical path, n: refractive index of medium,d: geometric distance.

Optical path difference $\delta = n_2 d_2 - n_1 d_1$,

So, in the IPLED, $\delta = 2n_{PF-FSO10}d + 2n_{MoO3}d_{MoO3} + \left|\frac{\Phi_m}{4\pi}\lambda\right|$, $\Phi_m = \arctan\left(\frac{2n_m k_m}{n_s^2 - n_m^2 - k_m^2}\right)$.

where n_s is the refractive index of the organic in contactwith the metal, and n_m and $k_m$are the real and imaginaryparts of the metal refractive index.[1]

$$\delta = \begin{cases} \pm k\lambda & k = 0,1,2,\ldots \quad (a) \\ \pm (2k+1)\frac{\lambda}{2} & k = 0,1,2,\ldots \quad (b) \end{cases}$$

λ:wavelength of light

when optical path difference meet the conditions of equation (a), the optical interference will increase the intensity of the light. Similarly, the optical interference will decrease the intensity of the light with optical path difference meeting the conditions of equation (b). If the value of optical path difference is too small to meet the conditions of equation (a) or (b), the stable optical interference will not beoccurred.

1 A. Dodabalapur, L. J. Rothberg, T. M. Miller and E. W. Kwock, *Appl. Phys. Lett.*, 1994, **64**, 2486.