

Supporting information

Highly Efficient Sky-Blue Fluorescent Organic
Light Emitting Diode Based on Mixed Cohost
System for Thermally Activated Delayed
Fluorescence Emitter (2CzPN)

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1. PL spectra of 2CzPN in the various host materials

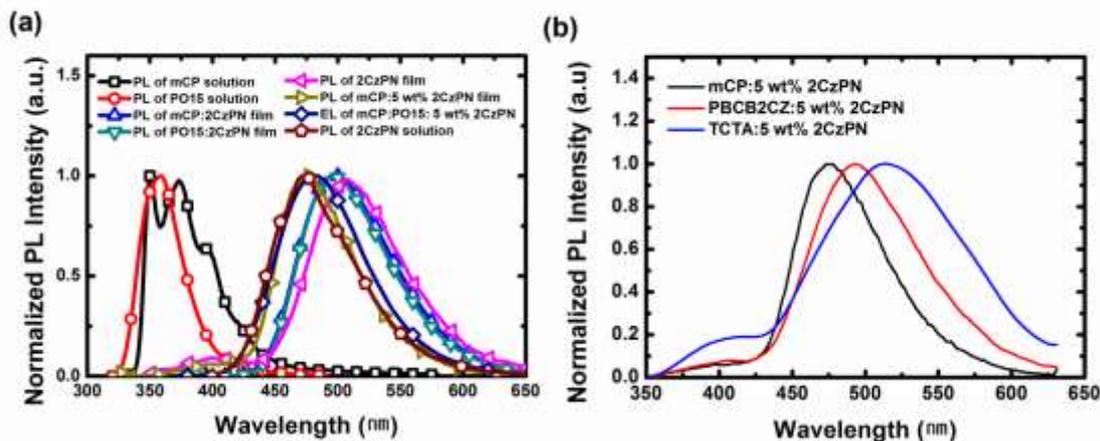


Figure S1.(a) The film PL spectra of mCP, PO15, 2CzPN, 50 wt% mCP: 50 wt% 2CzPN, 50 wt% PO15 : 50 wt% 2CzPN, and mCP:5 wt% 2CzPN, and the EL spectrum of the blue OLED. (b) PL spectra of mCP:5 wt% 2CzPN, PBCB2CZ:5 wt% 2CzPN, and TCTA:5 wt% 2CzPN. The film PL spectra were measured using 50 nm thick films deposited on precleaned fused silica substrates. Monochromatic light with the wavelength of 250 nm~330 nm, considering 2nd harmonic, from a Xenon lamp was used as the excitation source and a photomultiplier tube as the detector. With the selection of different hosts for 2CzPN, the PL spectra were different from solvatochromic effect due to CT characteristics of the TADF material.

2. Comparison of the horizontal transition dipole ratios

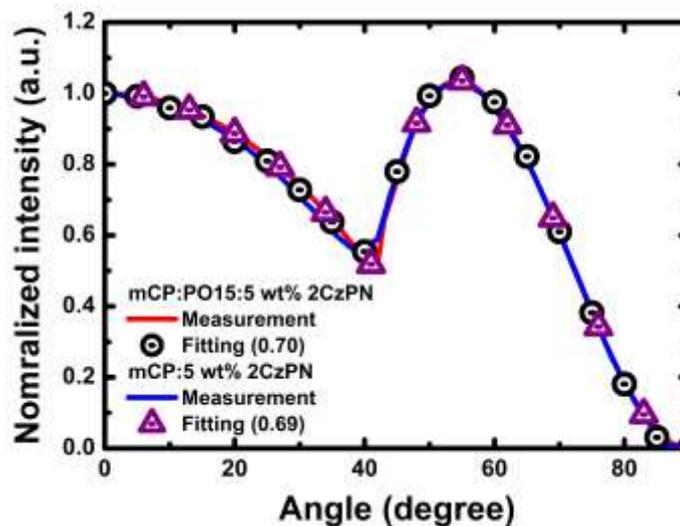


Figure S2. Angle-dependent PL intensities of the *p*-polarized light from a 30-nm-thick films of mCP:PO15:5 wt% 2CzPN and mCP:5 wt% 2CzPN. Solid line represents the theoretical fit to the experimental data with the horizontal transition dipole ratio of 0.70 and 0.69 for mCP:PO15:5 wt% 2CzPN and mCP:5 wt% 2CzPN, respectively. A continuous wave diode laser (405 nm, Edmund optics Inc.) was used as the excitation source and the incident angle of the excitation light was fixed at 45° from the plane normal direction of substrate and the *p*-polarized emitted light was detected at 480 nm.

3. Device performance

Table S1. Voltage, current efficiency, current density, EQE, and power efficiency of the OLED

	Turn on ⁺ /Max. [±]	1,000 cd/m ²	2,000 cd/m ²
Voltage [V]	3 ⁺	6.4	7.6
Current Density [mA/cm ²]	5.7×10 ⁻³⁺	22	60
Current Efficiency [cd/A]	45.3 [±]	5.5	3
EQE [%]	21.8 [±]	2.8	1.6
Power Efficiency [lm/W]	47.4 [±]	3	1.4