Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

A comparative study on carbazole-based thermally activated delayed fluorescence emitters with different steric hindrance

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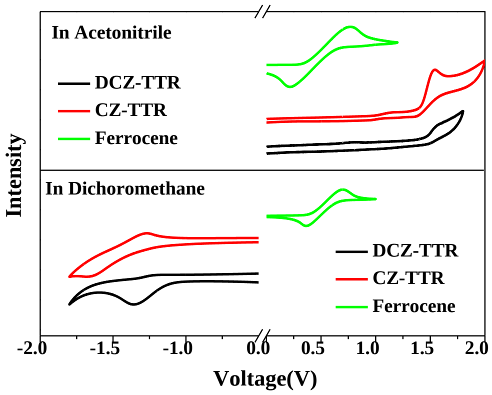

Figure S1. Cyclic voltammetry of ferrocence, CZ-TTR and DCZ-TTR in acetonitrile and dichloromethane.

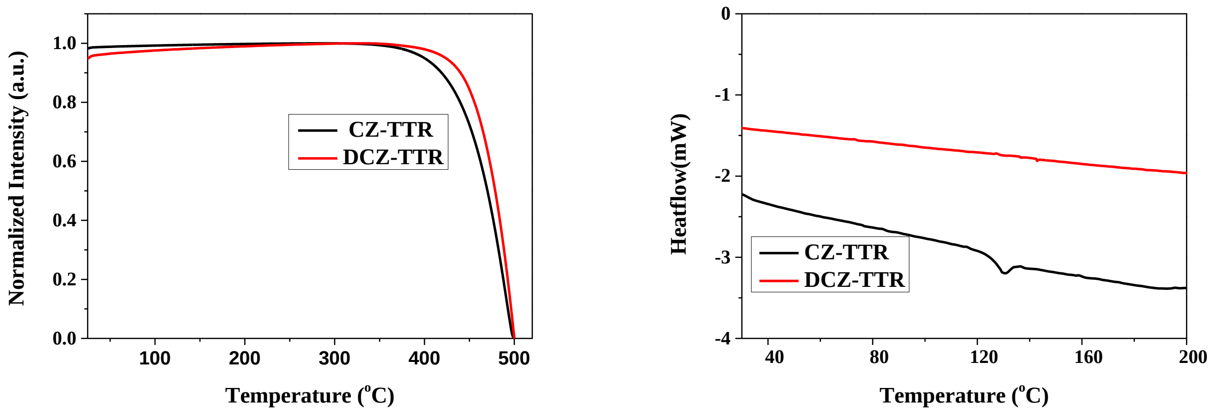

Figure S2. TGA (left) and DSC (right) thermograms of CZ-TTR and DCZ-TTR.

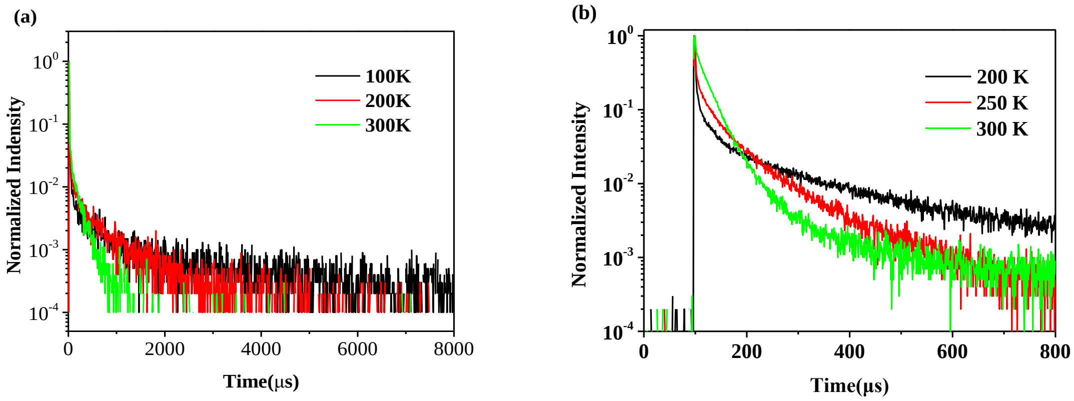

Figure S3. Transient PL decay curves for delayed emission of a) 10 wt% CZ-TTR and b) 6.5 wt% DCZ-TTR doped mCP film. (Excitation wavelength was 300 nm)

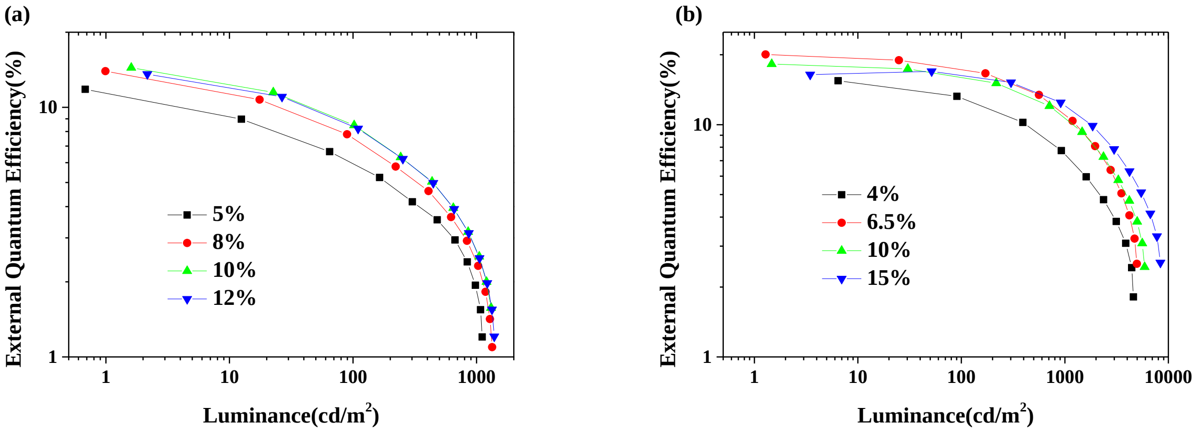

Figure S4. The device optimizations for (a) CZ-TTR and (b) DCZ-TTR.

Table S1. EL performances of the devices based on CZ-TTR and DCZ-TTR.

Device	V_{on}[a] (V)	EQE_{max} (%)	CE_{max} (cd/A)	PE_{max} (lm/W)	λ_{max} (nm)	FWHM (nm)	CIE (x, y)
CZ-TTR	3.1	14.4	32.5	32.9	492	101	(0.21,0.35)
DCZ-TTR	3.2	20.1	59.6	58.5	512	92	(0.25.0.50)

[a] Turn on voltage obtained at 1 cd/m^2.

Table S2. Kinetic parameters of CZ-TTR and DCZ-TTR.

Emitter	τ_p[a] [ns]	τ_d[b] [μs]	Φ_F [%]	Φ_{TADF} [%]	k_p [s^{-1}]	k_d [s^{-1}]	k_r^S [s^{-1}]	k_{ISC} [s^{-1}]	k_{RISC} [s^{-1}]	k_{nr}^T [s^{-1}]
CZ-TTR	**69.6**	**28.1**	**29.4**[c]	**27.3**[c]	**1.4×10^7**	**3.6×10^4**	**4.2×10^6**	**1.0×10^7**	**4.7×10^4**	**2.19×10^4**
			48.8[d]	**45.4**[d]			**7.0×10^6**	**7.4×10^6**	**6.5×10^4**	**4.0×10^3**
DCZ-TTR	**31.7**	**25.8**	**5.7**[c]	**41.5**[c]	**3.2×10^7**	**3.9×10^4**	**1.8×10^6**	**3.0×10^7**	**3.0×10^5**	**2.17×10^4**
			12.0[d]	**88.0**[d]			**3.8×10^6**	**2.8×10^7**	**3.2×10^5**	**0**

[a]Calculated using single-exponential decay fitting for prompt components in the range of 200 ns; [b] Calculated using triple-exponential decay fitting for delayed components in the range of 800 μs; [c] Estimated from the PLQY value in air; [d] Estimated from the device EQE assuming a light out-coupling efficiency of about 20%.