Supporting Information

Blue and White Solution-Processed TADF-OLEDs with Over 20% EQE, Low Driving Voltages and Moderate Efficiency Decline based on Interfacial Exciplex Hosts

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RESULTS DETAILS

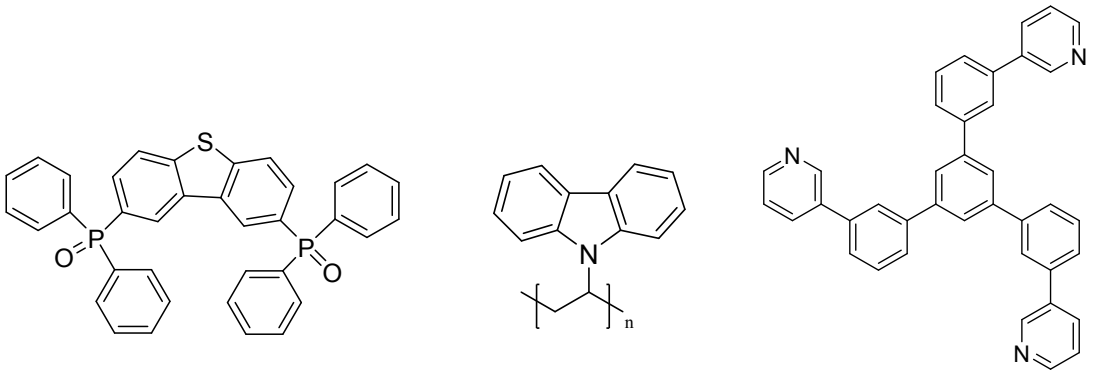
Table S1 optical characters of single molecules and exciplexes.

	PL (nm)	FWHM (nm)	S_1 (eV)	T_1 (eV)	ΔE_{ST} (meV)
mCP:PO-T2T	471	79	2.96	2.92	40
m-CBP:PO-T2T	475	87	2.95	2.92	30
CDBP:PO-T2T	476	85	2.96	2.91	50

Table S2 Optimized blue, red and white OLEDs Performance based on CDBP/PO-T2T host.

Device	V_{on} (V)	V_{100} [a] (V)	V_{1000} [b] (V)	CE $_{max}$ (cd/A)	PE $_{max}$ (lm/W)	EQE $_{max}$ (%)	EQE_{100} [c] (%)	EQE_{1000} [d] (%)
blue	3.6	4.4	5.8	56.6	46.7	21.0	20.2	13.6
red	4.3	5.0	6.8	18.9	11.9	13.5	13.0	9.3
white	4.1	4.8	5.8	47.6	31.3	20.8	20.2	11.8

[a] Voltage at 100 cd/m^2; [b] Voltage at 1000 cd/m^2; [c] EQE at brightness of 100 cd/m^2; [d] EQE at brightness of 1000 cd/m^2
The Optimized doping ratio of blue OLED is 25% 4CzFCN. The Optimized doping ratio of red OLED is 20% Ir(MDQ)$_2$acac. The Optimized doping ratio of white OLED is 25% 4CzFCN and 0.6% Ir(MDQ)$_2$acac.



PPT PVK TmPyPB

Figure S1. Molecular structures of other materials in this work.

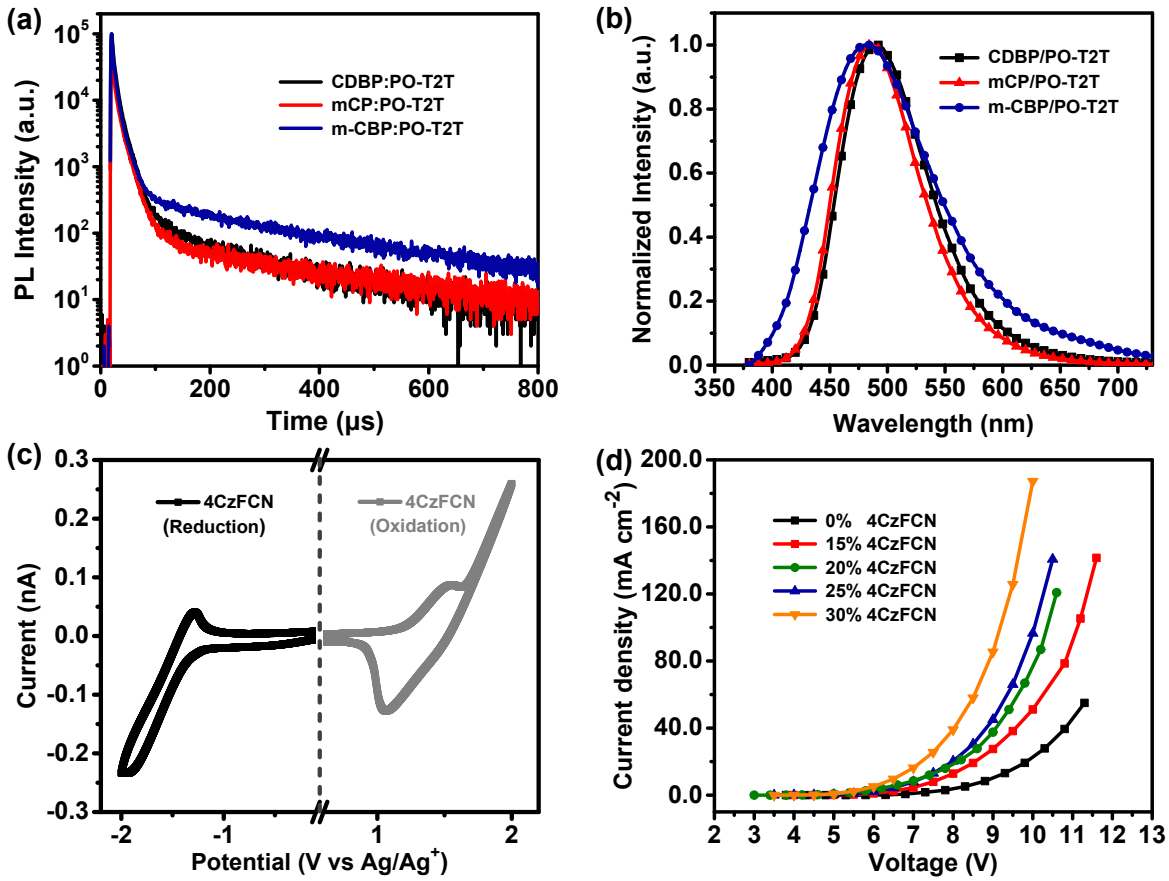


Figure S2. (a) Transient fluorescence decays of three exciplexes mixed films at 300 K; (b) EL spectra of the OLEDs using three interfacial exciplexes as the emitter (Device structures: ITO/PEDOT:PSS (30 nm)/hole-type host (30 nm)/PO-T2T (50 nm)/LiF (0.8 nm)/Al (100 nm)); (c) Cyclic voltammetry curves of 4CzFCN; (d) Current density–Voltage curves of blue OLEDs based on CDBP/PO-T2T host with different 4CzFCN doping concentration.

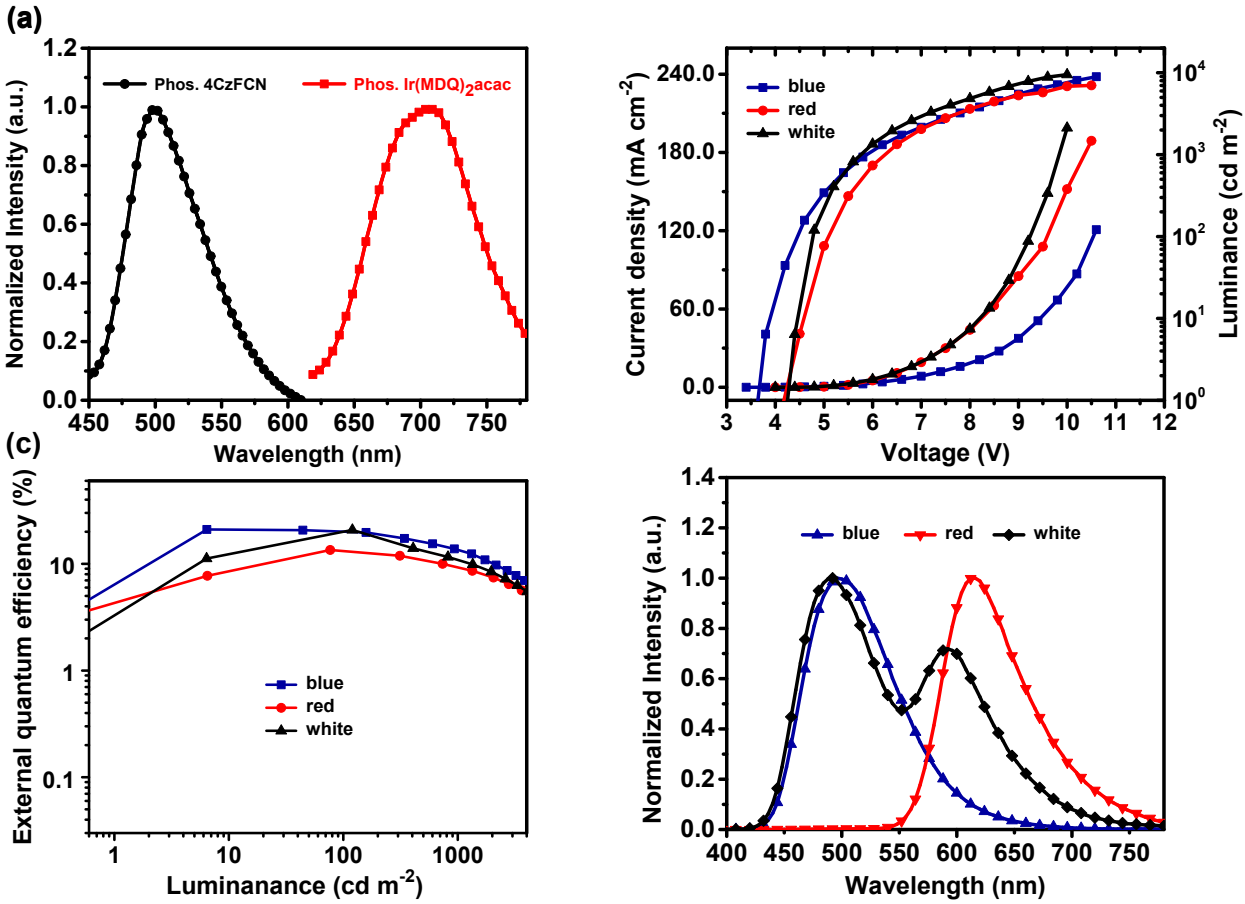


Figure S3. (a)Phosphorescence spectrum of Ir(MDQ)$_2$acac and 4CzFCN in solution-processed solid films at 77 K; EL characteristics of blue, red and white OLEDs based on CDBP/PO-T2T interfacial exciplex host: (b) current density-voltage-luminance curves, (c) EQE-luminance curves and (d) EL spectra.