

**High efficiency, low efficiency roll-off and long lifetime fluorescent
white organic light-emitting diodes based on strategic management
of triplet excitons via triplet-triplet annihilation up-conversion and
phosphor sensitization**

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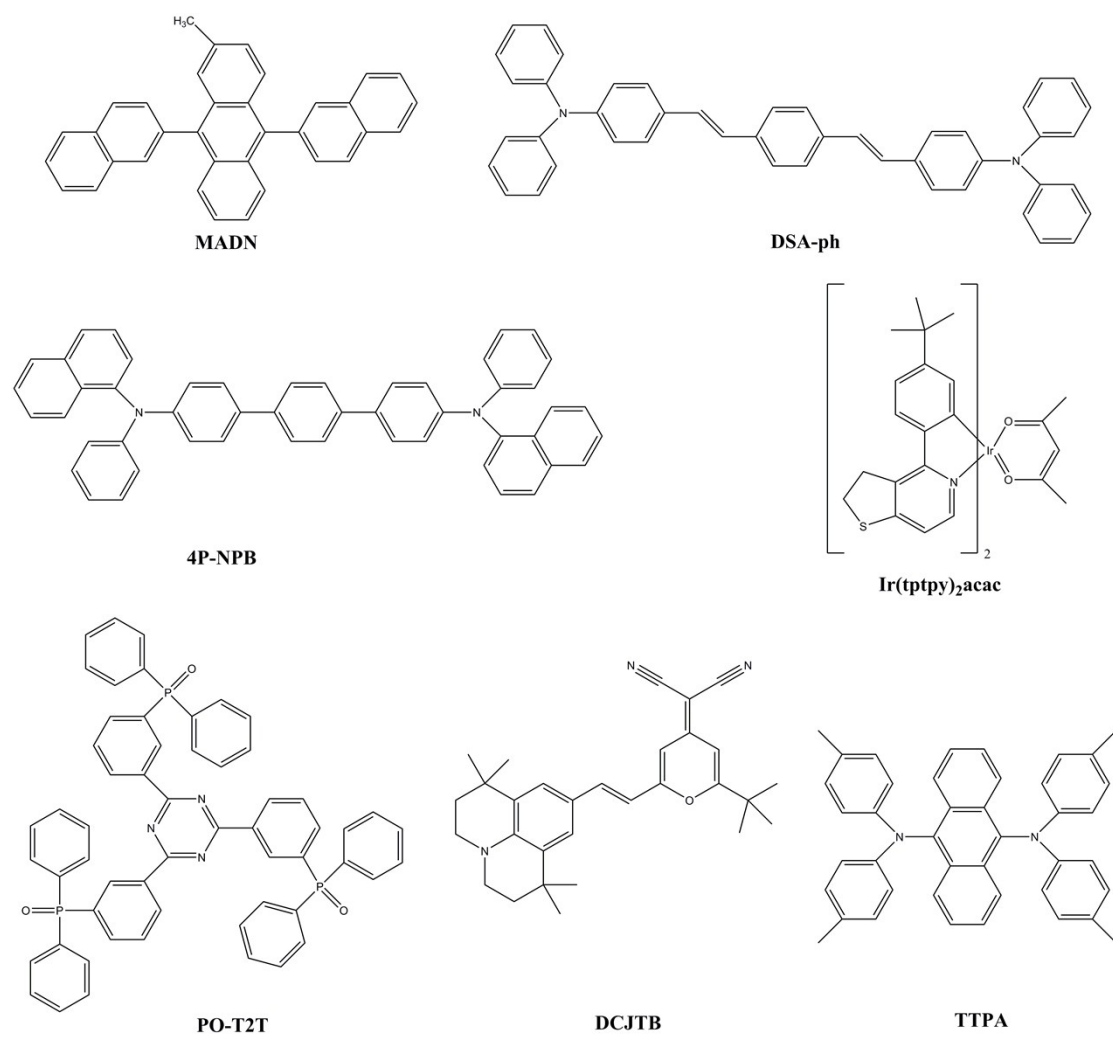


Fig. S1 Molecular structures of the used materials used in this work.

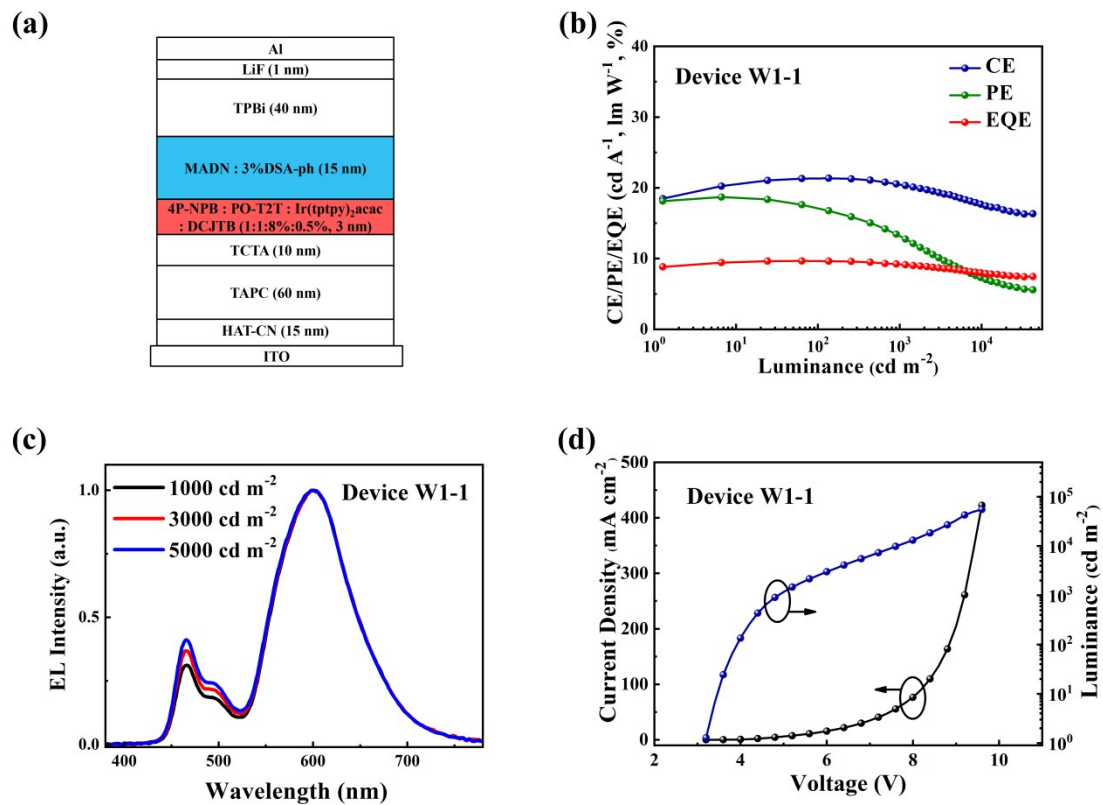


Fig. S2 Device structure and EL performances of the resulting two-color fluorescent WOLEDs (Device W1-1) without interlayer. (a) Device structure. (b) CE, PE and EQE-luminance characteristics. (c) EL spectra at different luminance. (d) Current density-luminance-voltage (J-L-V) characteristics.

Table S1 Summary of the EL performances of Devices W1 and W1-1.

Device	Von ^a (V)	Max CE ^b [cd A ⁻¹]	Max PE ^b [lm W ⁻¹]	Max EQE ^b [%]	CIE ^c (x, y)	Performance at the luminance of 1000/10000 cd m ⁻²		
						CE [cd A ⁻¹]	PE [lm W ⁻¹]	EQE [%]
W1	3.4	26.9	22.3	12.8	(0.51,0.41)	25.9/23.1	16.9/10.6	12.1/10.7
W1-1	3.2	21.4	18.7	9.7	(0.49,0.40)	20.3/17.4	12.8/7.0	9.1/7.5

^a Turn-on voltage at the luminance of 1 cd m⁻²; ^b Maximum current efficiency, maximum power efficiency, and maximum external quantum efficiency; ^c Commission Internationale de L'Eclairage at the luminance of 1000 cd m⁻².