## **Electronic Supplementary Information**

## High efficiency and low efficiency roll-off all fluorescent white organic light-emitting diodes based on phosphor sensitization

Jingwen Yao, Yuwen Chen, Yibing, Wu, Xianfeng Qiao, Dezhi Yang, Yanfeng Dai, Qian Sun, and Dongge Ma\*

Institute of Polymer Optoelectronic Materials and Devices, Guangdong Provincial Key Laboratory of Luminescence from Molecular Aggregates, State Key Laboratory of Luminescent Materials and Devices, South China University of Technology, Guangzhou 510640, China

E-mail: msdgma@scut.edu.cn





**Fig. S1 (a)** Schematic diagram of the devices B and B1. (b) Structure diagram of devices Y and Y1. (c) EQE-luminance characteristics of devices B and B1. (d) EQE-luminance characteristics of devices Y and Y1. (e) CE-luminance characteristics of devices B and B1. (f) CE-luminance characteristics of devices Y and Y1. (g) PE-luminance characteristics of devices B and B1. (h) PE-luminance characteristics of devices Y and Y1. (i) EL spectra of devices B and B1 at the luminance of 1000 cd m<sup>-2</sup>. (j) EL spectra of devices Y and Y1 at the luminance of 1000 cd m<sup>-2</sup>. (k) EL spectra of

devices B and B1 at the luminance of 3000 cd m<sup>-2</sup>. (I) EL spectra of devices Y and Y1 at the luminance of 3000 cd m<sup>-2</sup>. (m) EL spectra of devices B and B1 at the luminance of 5000 cd m<sup>-2</sup>. (n) EL spectra of devices Y and Y1 at the luminance of 5000 cd m<sup>-2</sup>.

Device	EML	V <sub>on</sub> <sup>a)</sup>	Max CE <sup>b)</sup>	Max PE <sup>b)</sup>	Max EQE <sup>b)</sup>	Performance at the luminance of 1000/5000 cd m <sup>-2</sup>		
		(V)	[ cd A <sup>-1</sup> ]	[lm W <sup>-1</sup> ]	[%]	CE [ cd A <sup>-1</sup> ]	PE [lm W-1]	EQE [%]
В	8%fac-Ir(iprmpi) <sub>3</sub> : 1%TBPe	3.8	33.0	27.3	17.9	25.7/22.3	13.9/10.3	13.7/11.9
B1	1%TBPe	4.2	6.9	5.1	5.4	3.9/2.8	1.7/0.9	3.3/2.4
Y	6%Ir(ppy)3:2%TBRb	3.8	37.0	27.5	12.6	33.0/29.0	18.5/12.6	10.8/9.5
Y1	2%TBRb	4.4	12.7	9.1	4.2	7.2/6.0	3.2/2.1	2.3/2.0

**Table S1** Summary of the performances of the blue and yellow fluorescent OLEDs

 with and without phosphor sensitizer.

<sup>a)</sup>Turn-on voltage at the luminance of 1 cd m<sup>-2</sup>; <sup>b)</sup>Maximum current efficiency,

maximum power efficiency, and maximum external quantum efficiency.