Supporting Information

Novel Bipolar Fluorescent Polymers bearing N^{+}=P-O^{-} resonance structures for Fluorescent–Phosphorescent (F-P) Hybrid White polymer light-emitting diodes (WPLEDs)

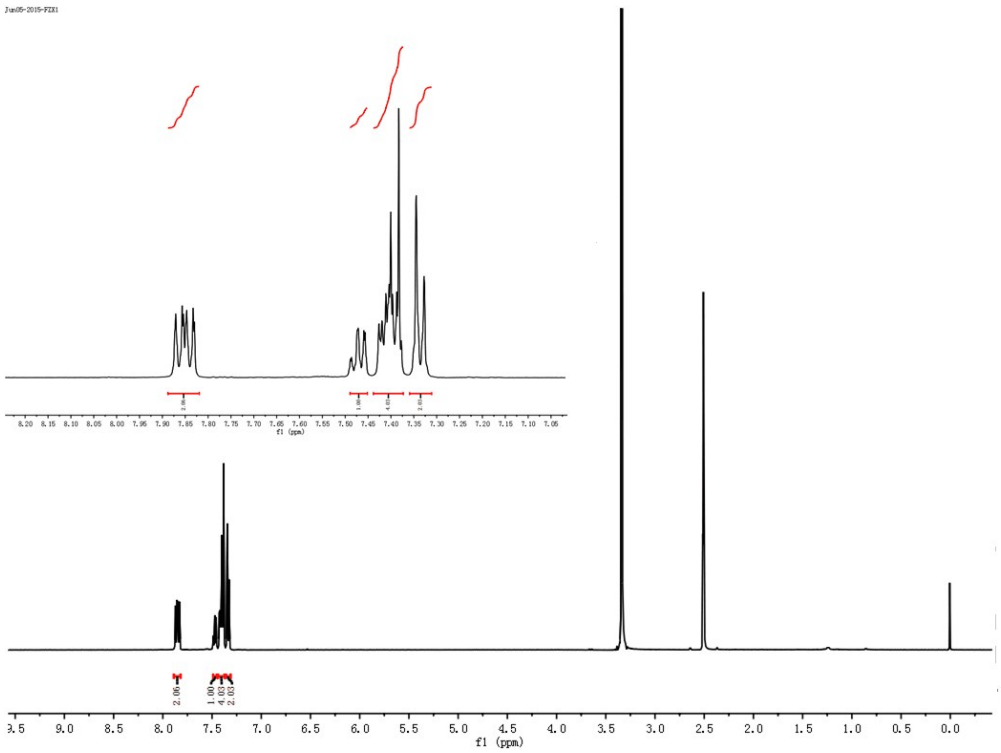

Figure S1. ^{1}H NMR spectra of monomer **M1**.

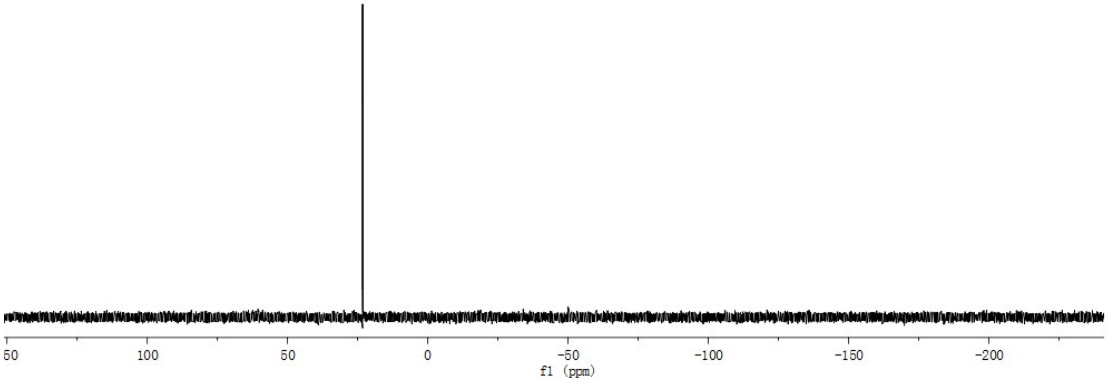

Figure S2. ^{31}P NMR spectra of monomer **M1**.

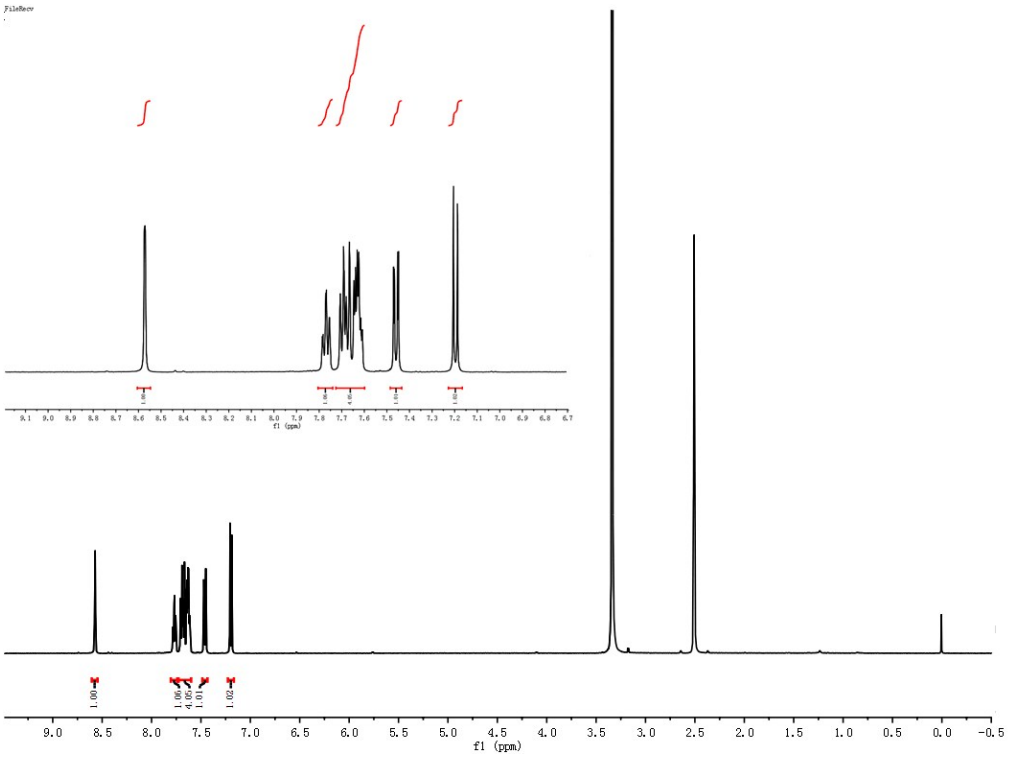

Figure S3. ^{1}H NMR spectra of monomer **M2**.

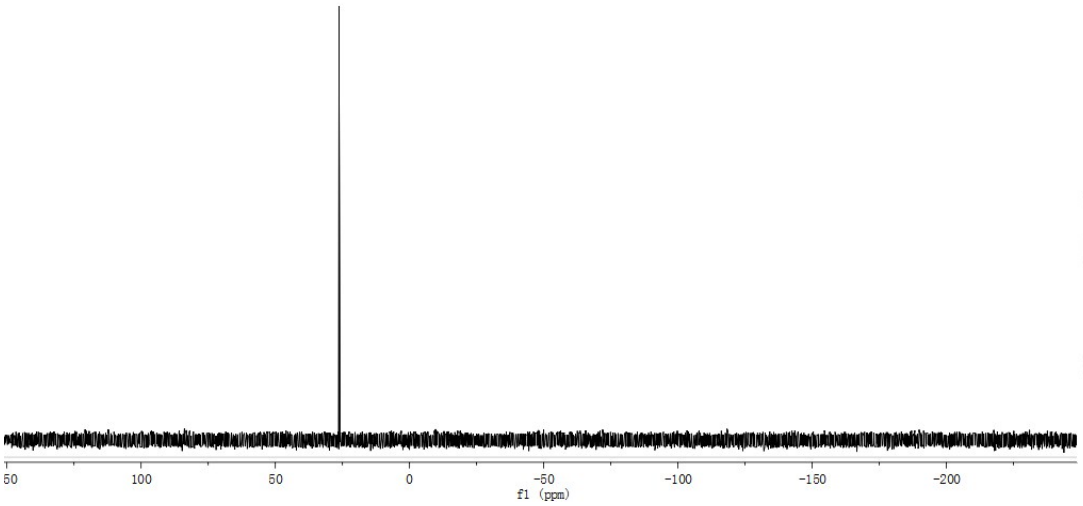

Figure S4. ^{31}P NMR spectra of monomer **M2**.

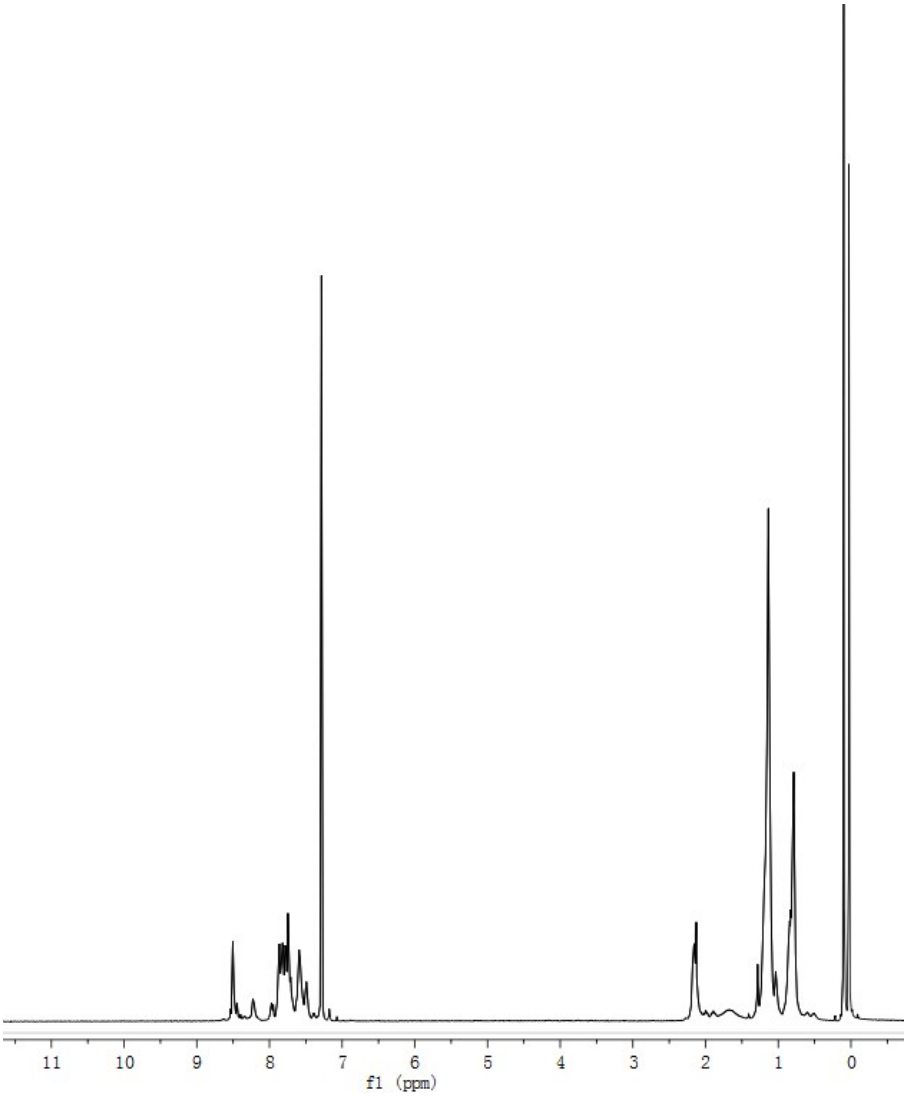

Figure S5. ^{1}H NMR spectra of **PPOCzF**.

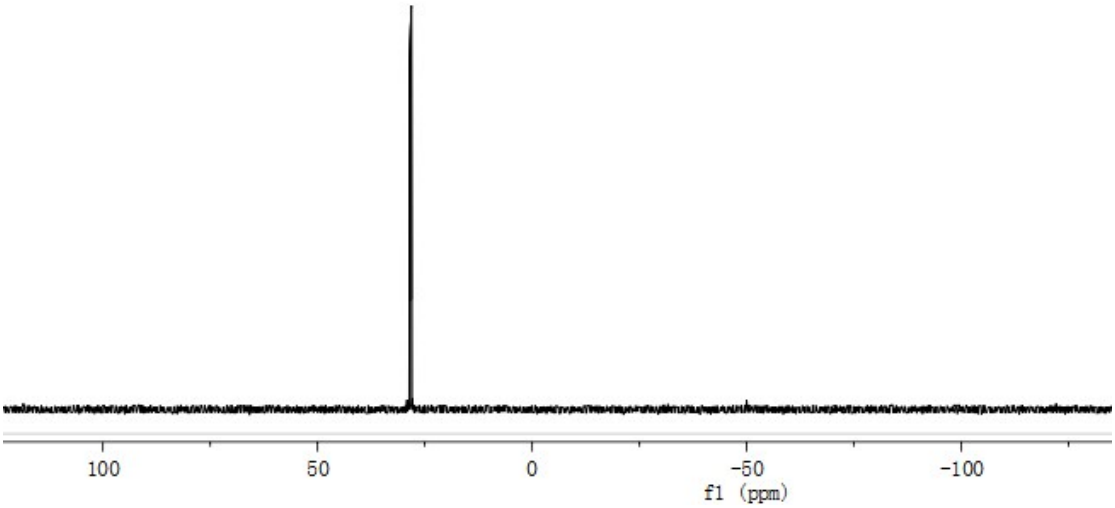

Figure S6. ^{31}P NMR spectra of **PPOCzF**.

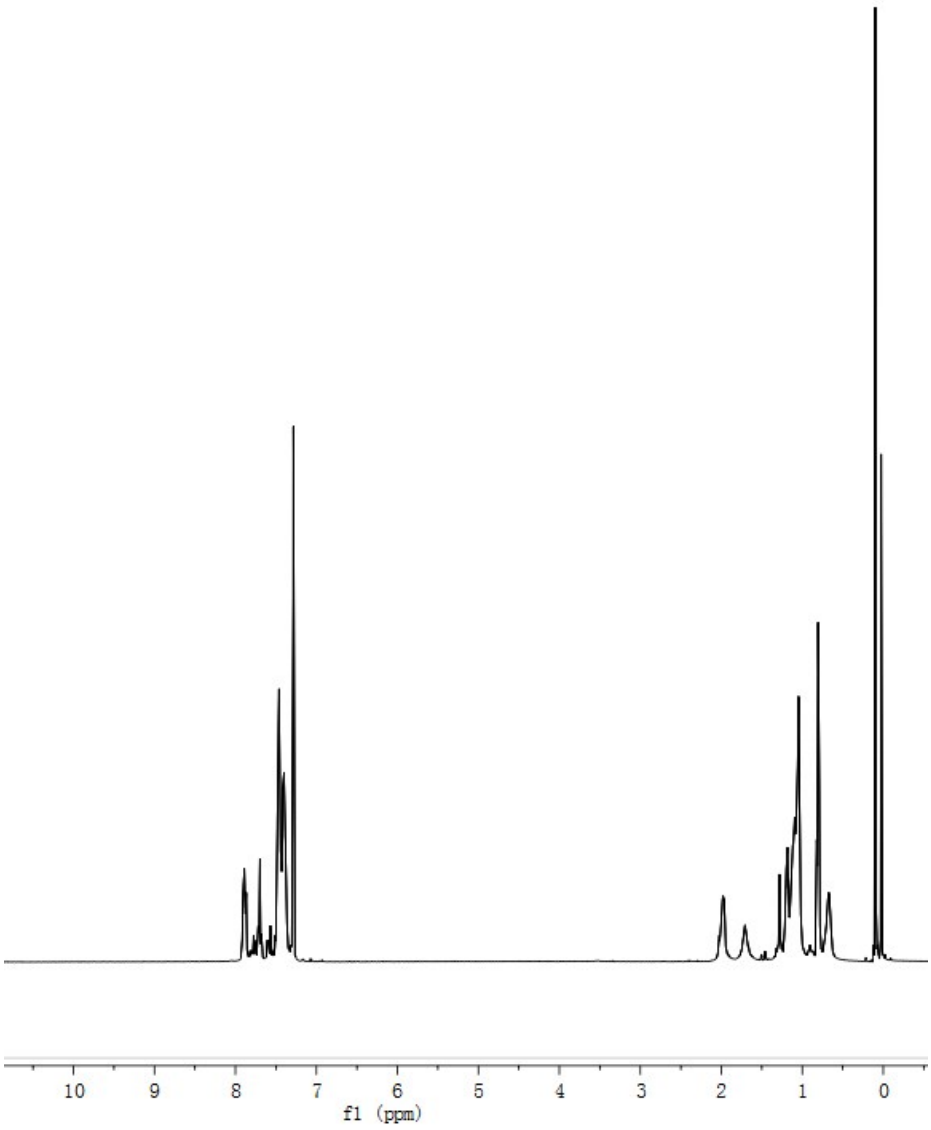

Figure S7. ^{1}H NMR spectra of **PPOPAF**.

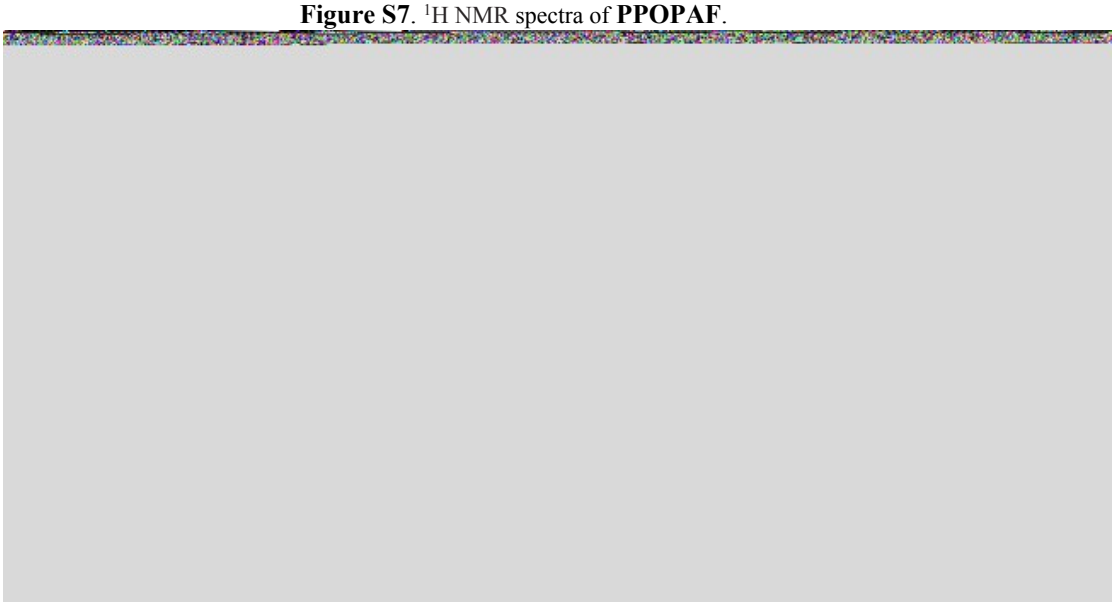

Figure S8. ^{31}P NMR spectra of **PPOPAF**.

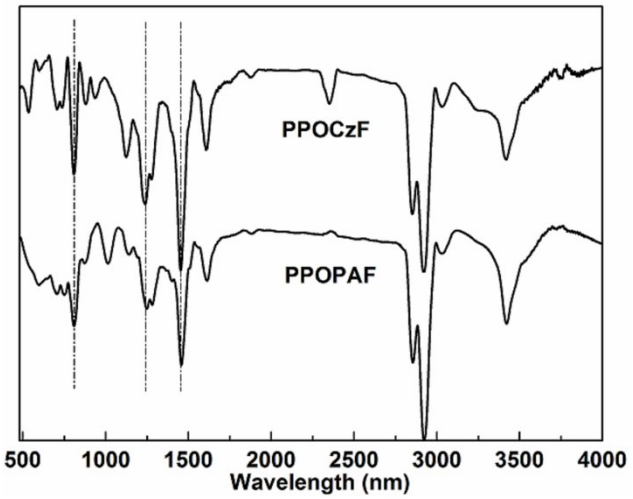

Figure S9. The FT-IR spectra of the polymers.

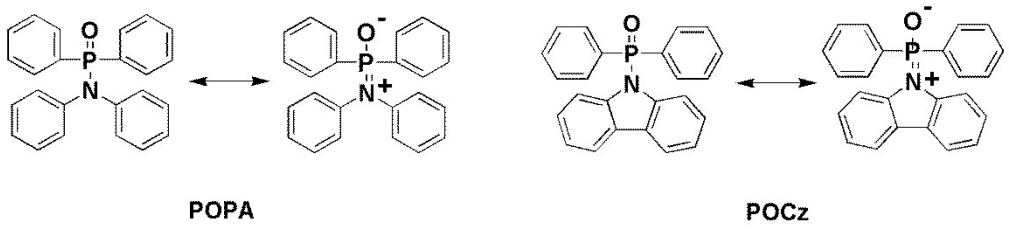

Figure S10. The most possible N-P=O resonance structures of **POPA** and **POCz** in polymers.

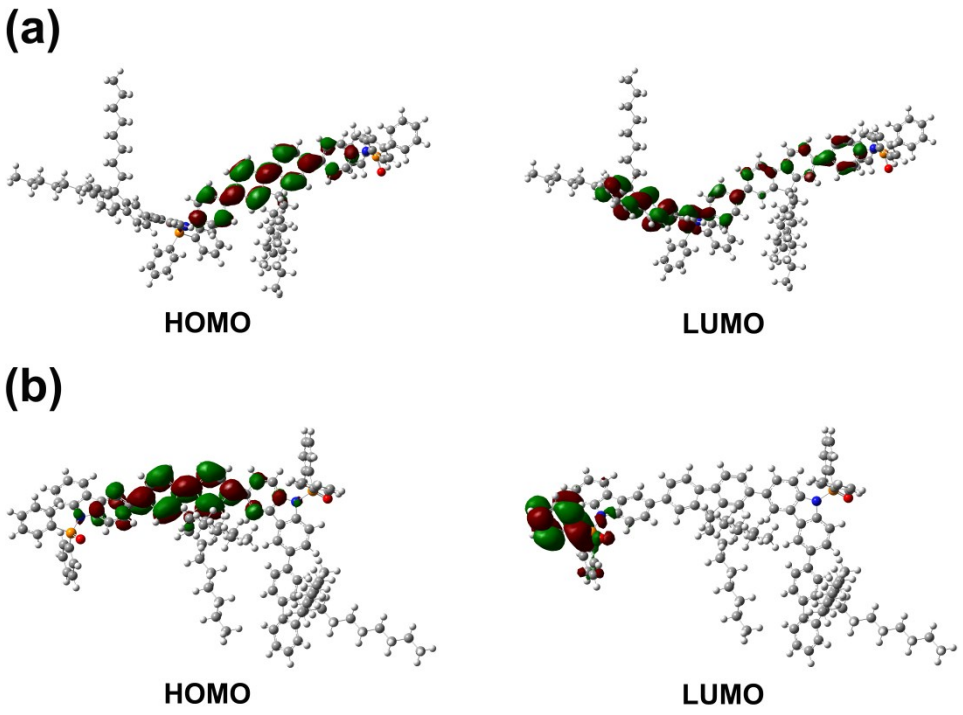

Figure S11. HOMO and LUMO distributions of the lowest excited **PPOPAF** (a) and **PPOCzF** (b) calculated by B3LYP/6-31G.

Table **S1**. Summary of the non-doped devices performances based on **PPOPAF** or **PPOCzF**.

EML	V_{on}[a] [V]	L_{max}[b] [cd/m^2]	$\eta_{,max}$[c] [cd/A]	PE[d] [lm/W]	EQE_{max}[e] [%]	CIE[f] coordinates
PPOPAF	6.8	252	0.94	0.4	0.97	(0.16, 0.10)
PPOCzF	7.2	260	1.2	0.5	1.2	(0.17, 0.10)

a) Recorded at 1 cd/m^2; b) Maximum luminance; c) Maximum luminous efficiency;
d) Maximum power efficiency; e) Maximum external quantum efficiency;
f) at the brightness of 100 cd m^{-2}.

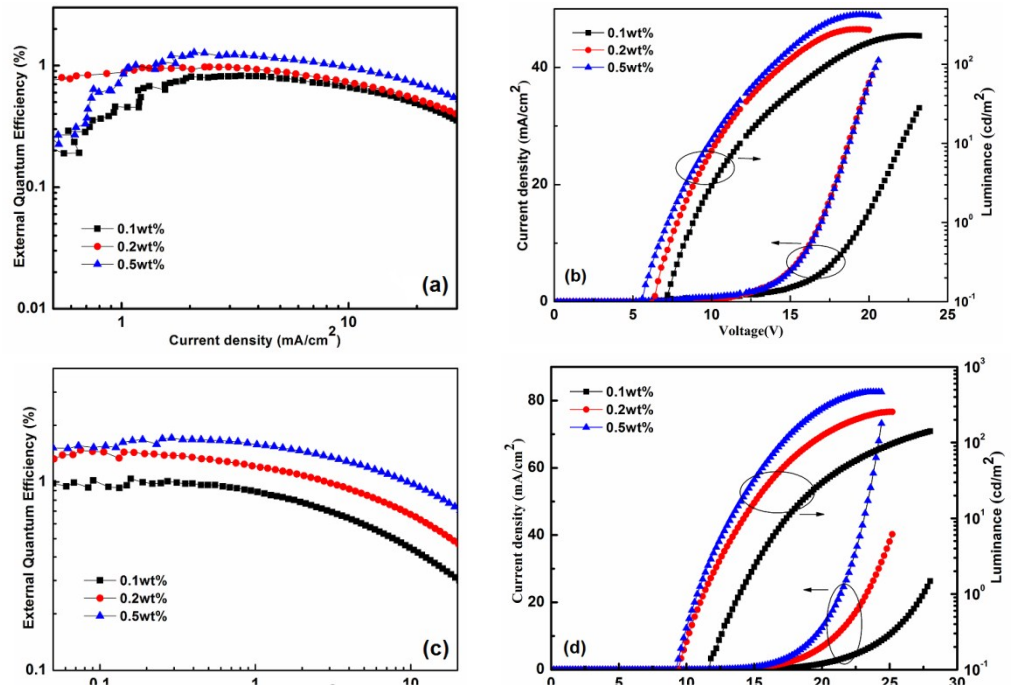

Figure S12. The EQE and *J-V-L* curves of the white device: PPOPAF (a), (b); PPOCzF (c), (d).

Table **S2**. Summary of the hybrid devices performances based on **PPOPAF**.

Doping concentration	V_{on}[a] [V]	$\eta_{,max}$[b] [cd/A]	PE[c] [lm/W]	EQE_{max}[d] [%]	$\eta_{,max}$[e] [cd/A]	PE[e] [lm/W]	EQE_{max}[e] [%]	CIE coordinates
0.1 wt %	8.8	1.9	0.4	0.83	1.7	0.31	0.77	(0.37, 0.34)
0.2 wt %	7.8	2.3	0.6	0.98	2.1	0.44	0.91	(0.35, 0.33)
0.5 wt %	7.2	3.4	0.81	1.3	3.3	0.73	1.2	(0.43, 0.31)

a) Recorded at 1 cd/m^2 ; b) Maximum luminous efficiency;
c) Maximum power efficiency; d) Maximum external quantum efficiency;
e) at the brightness of 100 cd m^{-2}.

Table **S3**. Summary of the hybrid devices performances based on **PPOCzF**.

Doping concentration	V_{on}[a] [V]	$\eta_{,max}$[b] [cd/A]	PE[c] [lm/W]	EQE_{max}[d] [%]	$\eta_{,max}$[e] [cd/A]	PE[e] [lm/W]	EQE_{max}[e] [%]	CIE[e] coordinates
0.1 wt %	13.8	2.1	0.48	1.1	0.85	0.1	0.4	(0.35, 0.33)
0.2 wt %	11.2	3.6	0.9	1.5	2.1	0.3	0.9	(0.41, 0.38)
0.5 wt %	10.8	4.4	1.1	1.7	3.5	0.5	1.4	(0.45, 0.42)

a) Recorded at 1 cd/m^2 ; b) Maximum luminous efficiency;
c) Maximum power efficiency; d) Maximum external quantum efficiency;
e) at the brightness of 100 cd m^{-2}.