Supporting information

Synthesis and Electrical Properties of a New Bipolar Material Using Spacer Moiety

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Table S1. Absorption frequencies and oscillator strengths calculated with TD-B3LYP/6-311G(d) for the DTPCZ

Absorption		Oscillator strength	Characteristic of transition	Contribution
Wavelength (nm)	Energy (eV)			
409.1	3.031	0.061	HOMO→LUMO	58.1
			HOMO→LUMO+1	39.9
391.1	3.170	0.005	HOMO→LUMO	40.9
			HOMO→LUMO+1	58.8
307.7	4.030	0.004	HOMO-9→LUMO	72.5
304.9	4.067	0.005	HOMO-2→LUMO	45.7
303.4	4.086	0.076	HOMO→LUMO+2	84.8
302.8	4.095	0.005	HOMO-10→LUMO	46.7
301.4	4.113	0.007	HOMO-10→LUMO+1	31.7
			HOMO-2→LUMO+1	25.2
298.7	4.150	0.014	HOMO-9→LUMO+1	85.7
294.7	4.207	0.116	HOMO-2→LUMO	24.0
			HOMO-2→LUMO+1	20.5
293.1	4.230	0.017	HOMO-2→LUMO+1	38.2
289.5	4.282	0.010	HOMO-2→LUMO+3	93.4

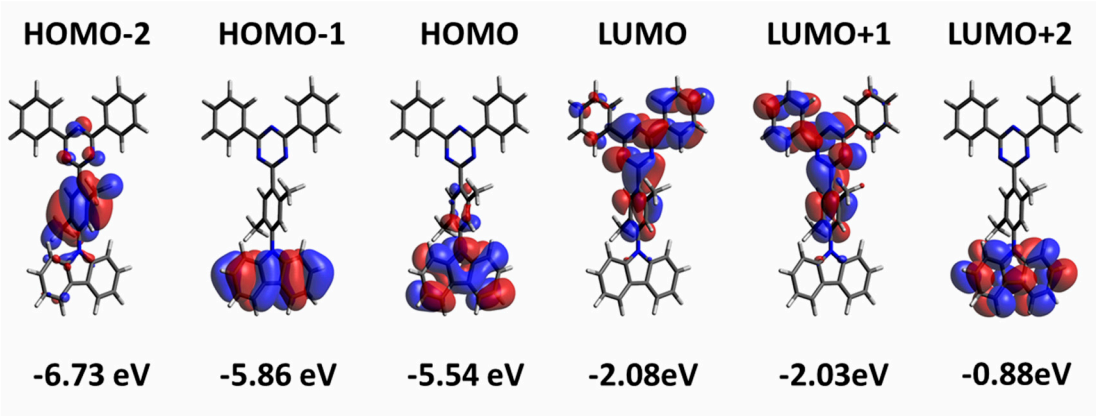

Figure S1. Electron density distributions of molecular orbitals of DTPCZ (calculated using the B3LYP/def2-TZVP method).

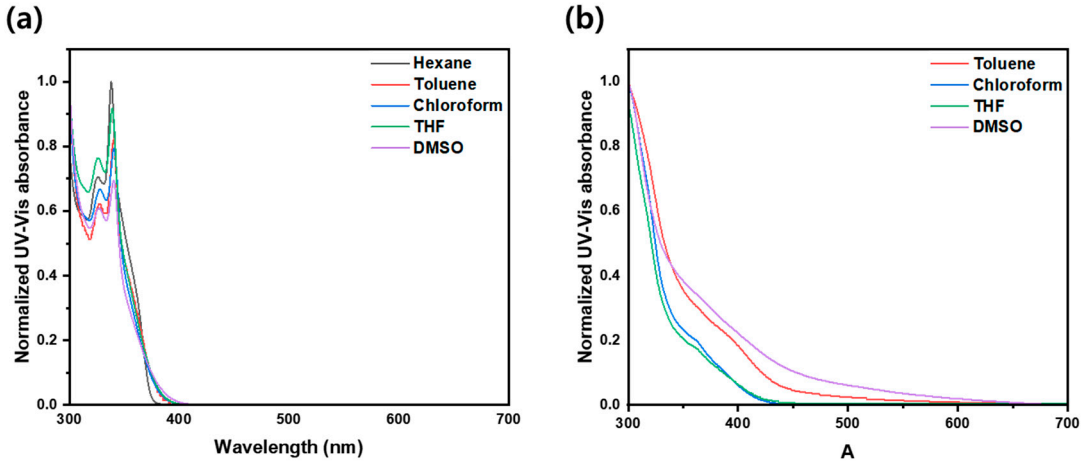

Figure S2. Normalized UV-Vis absorption spectra of (a) DTPCZ and (b) Poly DTPCZ according to different polarity of solvents at 0.5 wt%.

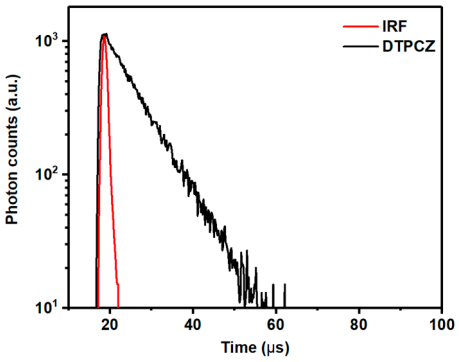

Figure S3. Transient photoluminescence decay spectra of the solution(toluene) (IRF: instruments response function). Range : 100 μs.

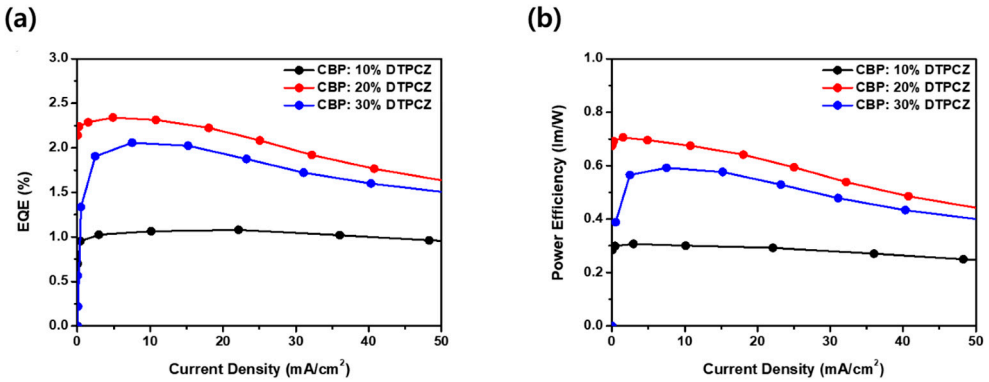

Figure S4. EL characteristics of devices using DTPCZ as EMLs dopant: (a) PE versus current density, and (b) EQE versus current density.

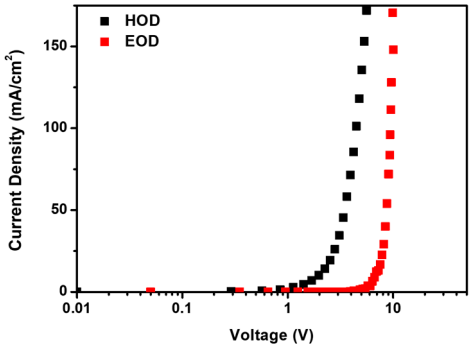

Figure S5. J–V characteristics of HOD and EOD of DTPCZ.

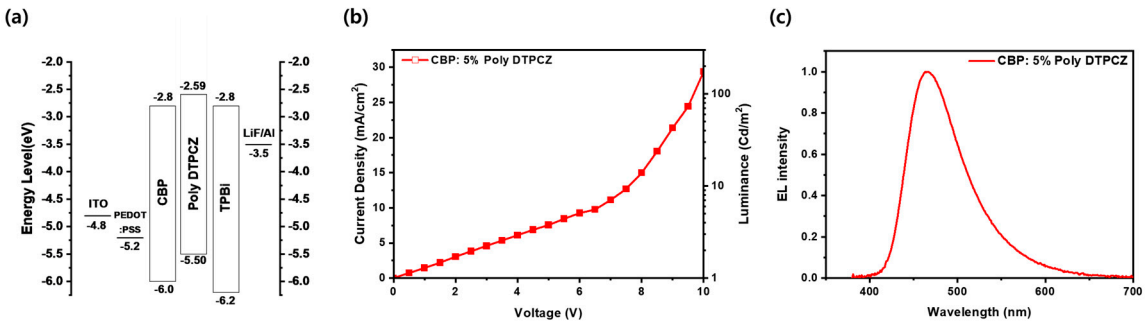

Figure S6. EL characteristics of devices using Poly DTPCZ as EMLs 5 wt% dopant: (a) band diagram of solution process OLED device, (b) J-V curve, (c) EL spectrum of doped device of Poly DTPCZ.

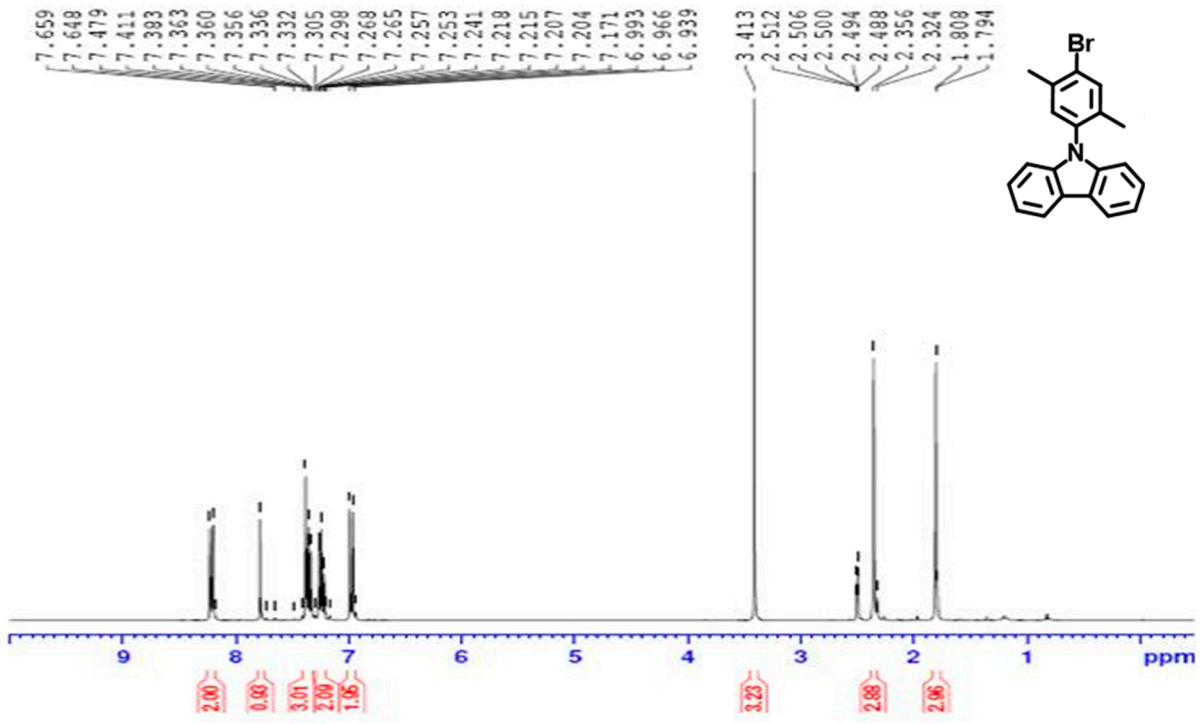

Figure S7. [1]H NMR spectra of compound (**1**) recorded in DMSO-d_6 (300 MHz)

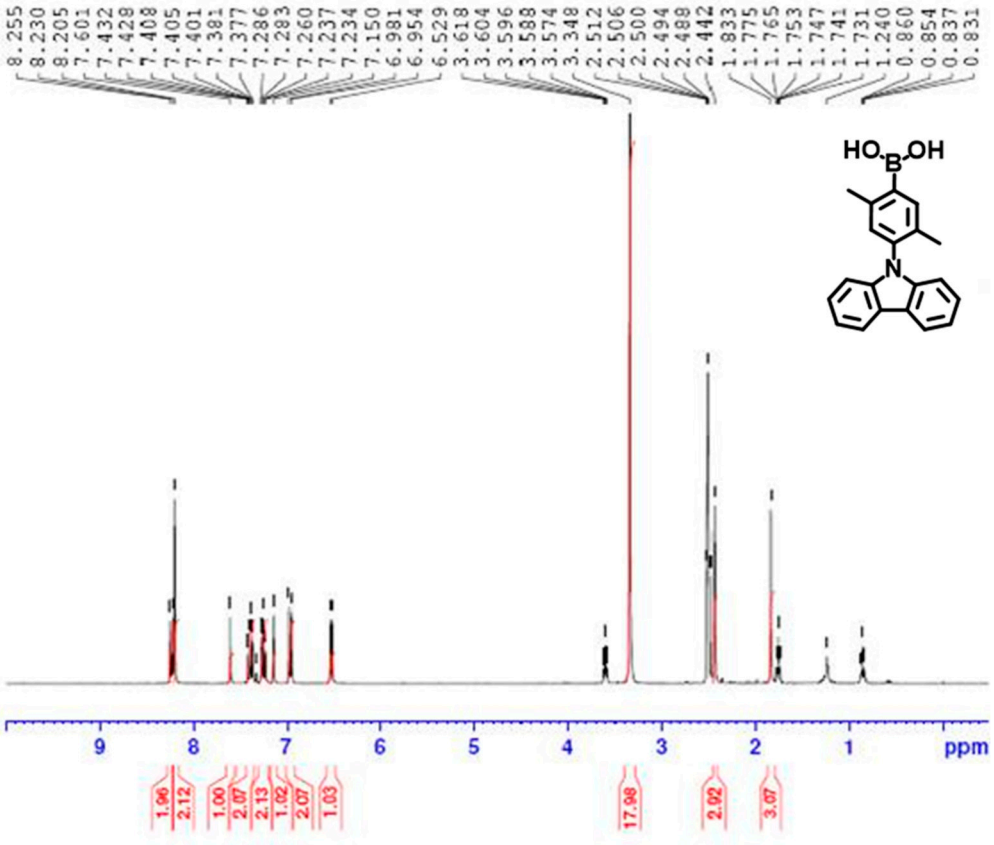

Figure S8. [1]H NMR spectra of compound (**2**) recorded in DMSO-d_6 (300 MHz)

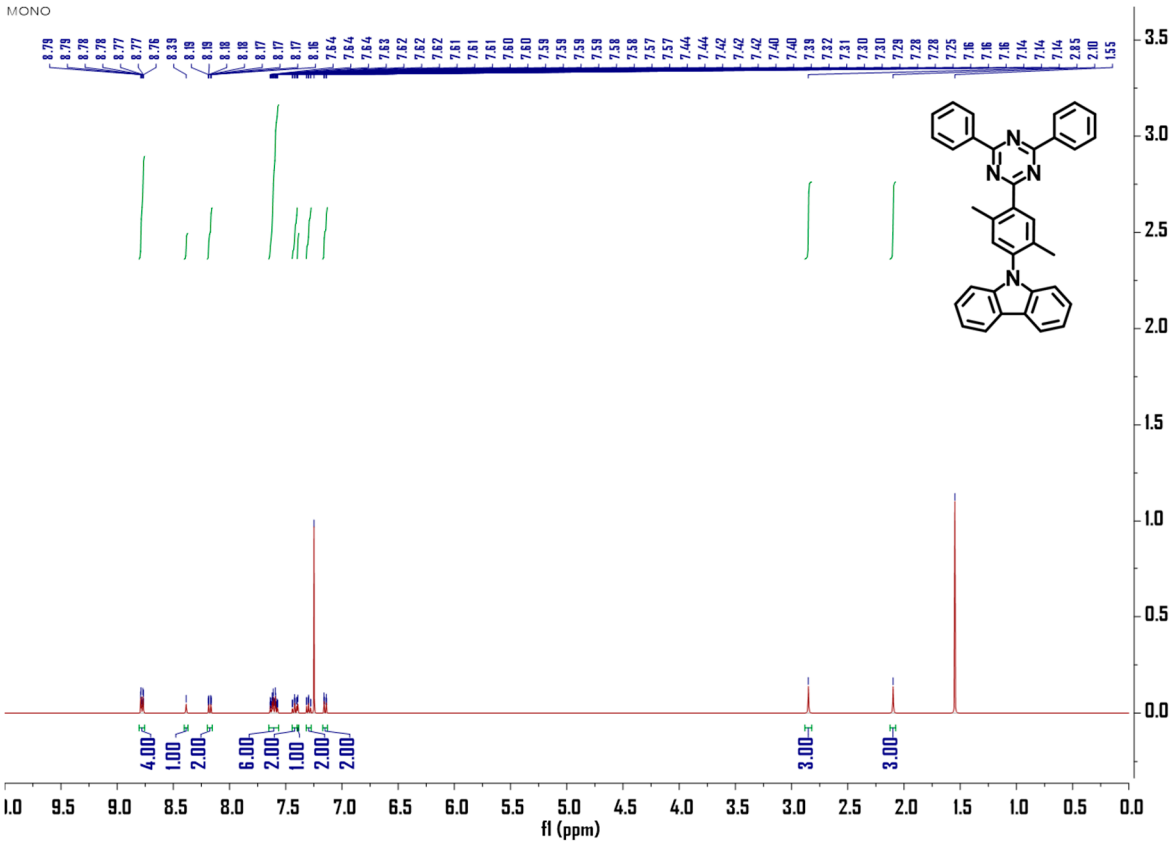

Figure S9. ^{1}H NMR spectra of DTPCZ recorded in $CDCl_3$ (400 MHz)

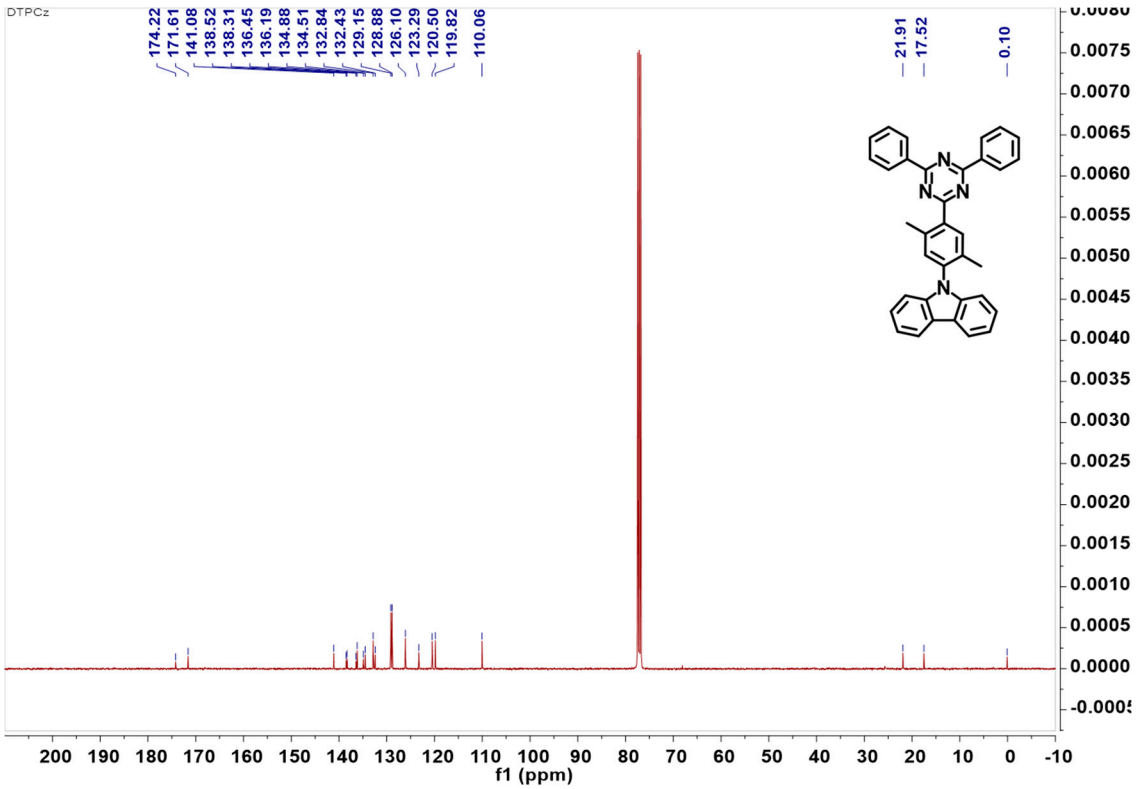

Figure S10. ^{13}C NMR spectra of DTPCZ recorded in $CDCl_3$ (100 MHz)

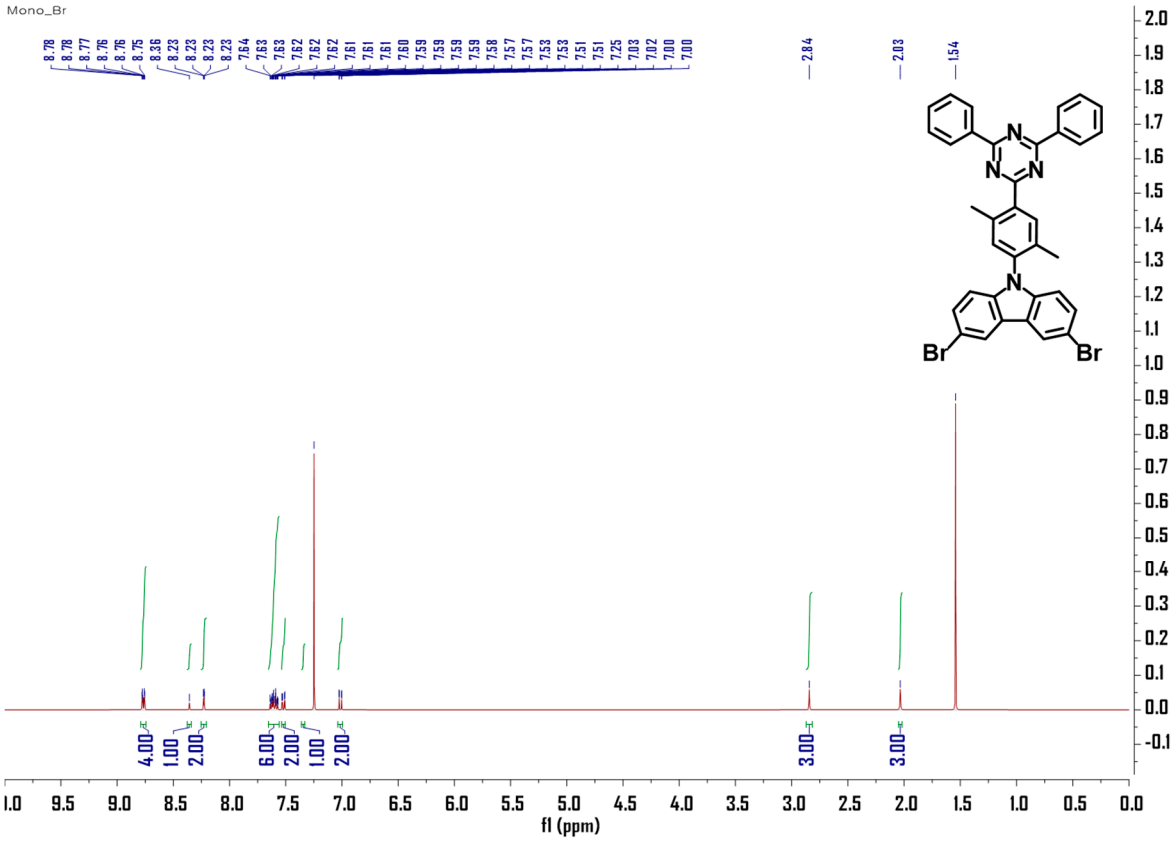

Figure S11. ^{1}H NMR spectra of compound (**3**) recorded in $CDCl_3$ (400 MHz)

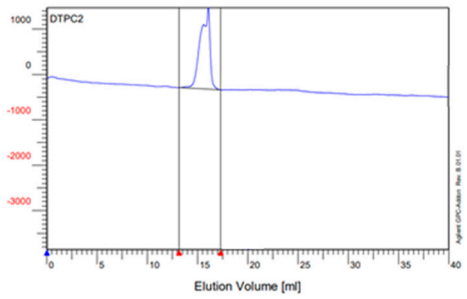

Figure S12. GPC traces of synthesized Poly DTPCZ using THF as eluent.