Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Carbazole/α-carboline hybrid bipolar compounds as electron acceptors in exciplex, non-exciplex mixed cohosts and exciplex-emitters for high-efficiency OLEDs

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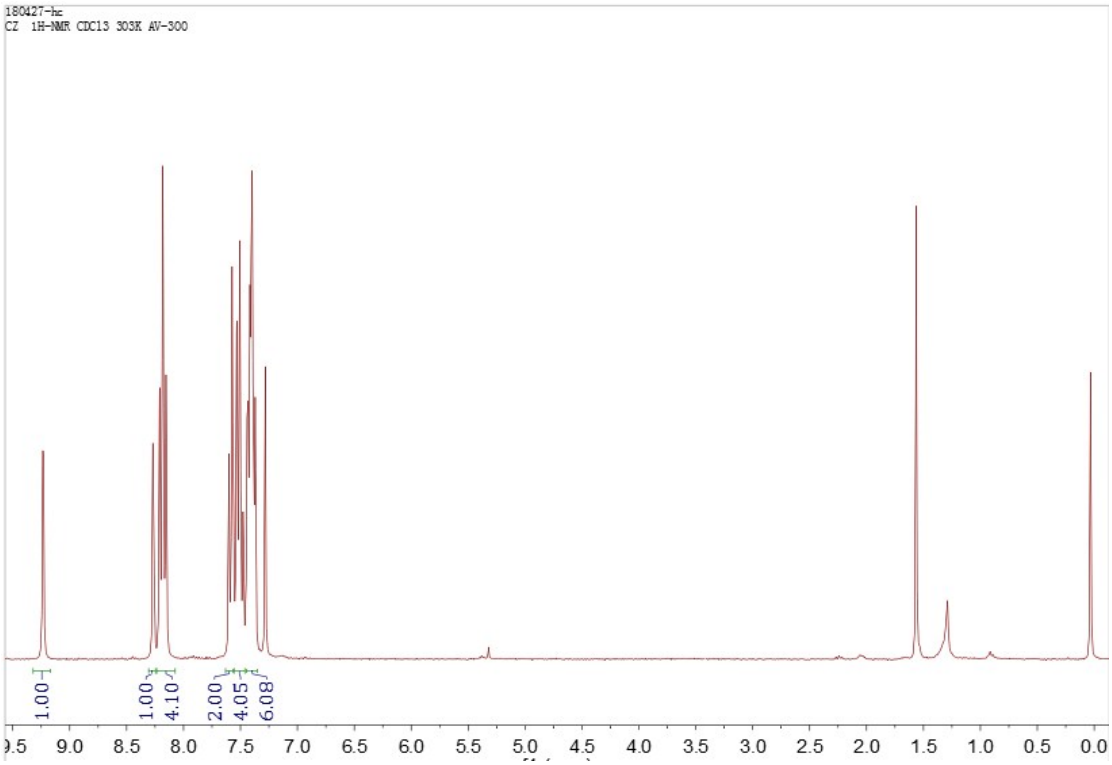


Figure S1. ^{1}H NMR spectrum of compound CzPyCN.

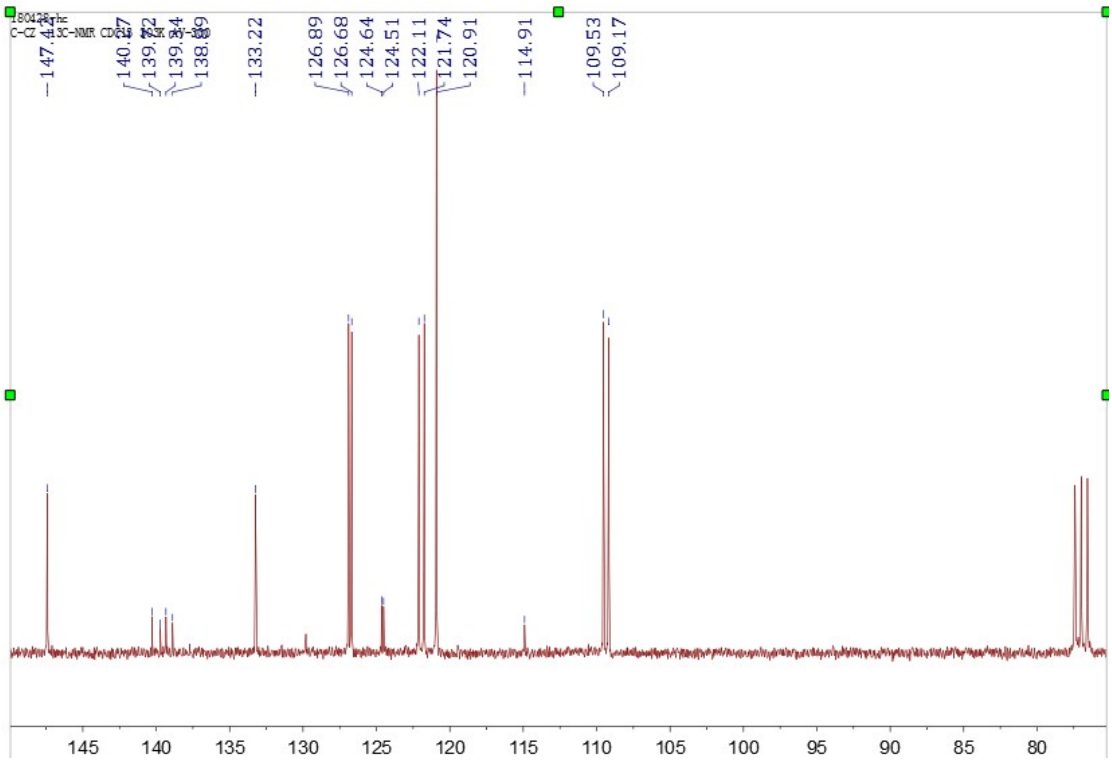


Figure S2. ^{13}C NMR spectrum of compound CzPyCN.

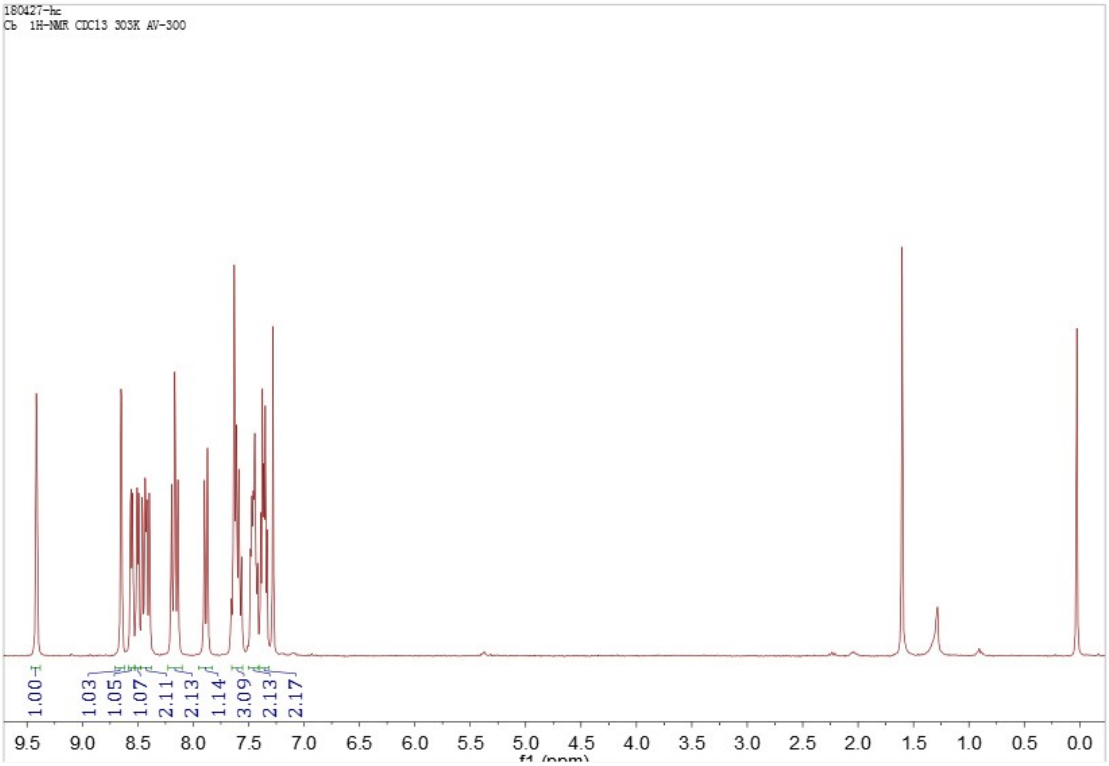


Figure S3. ^{1}H NMR spectrum of compound CbPyCN.

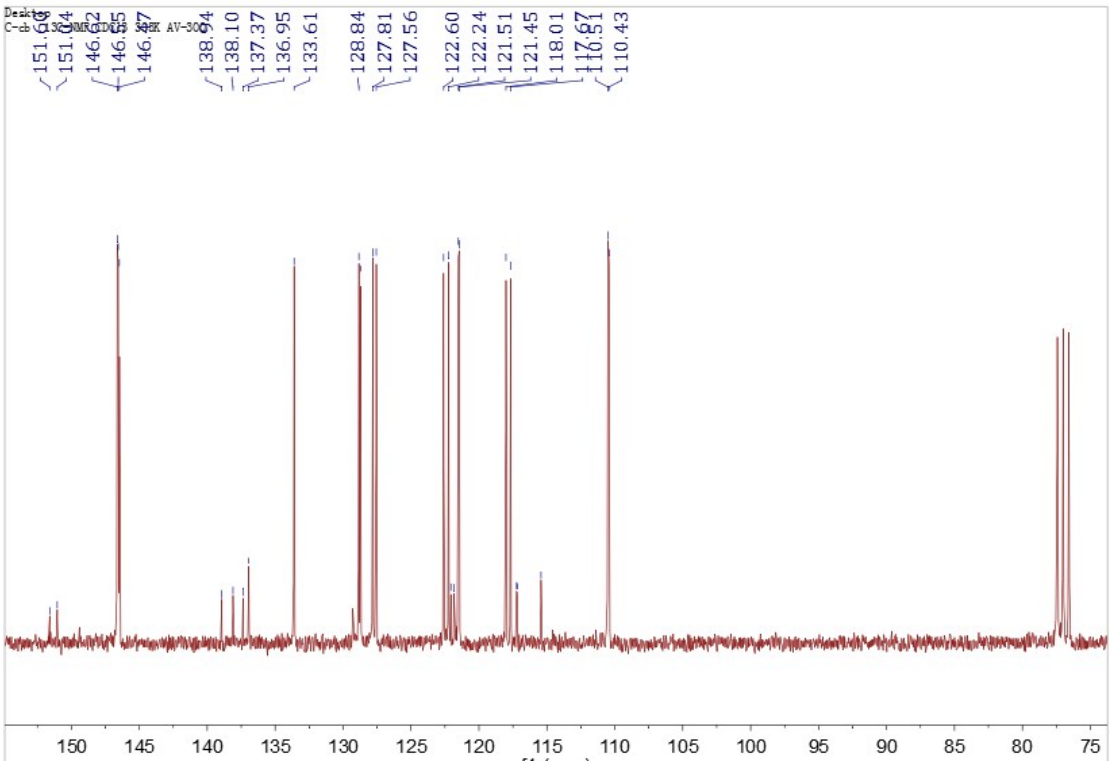


Figure S4. ^{13}C NMR spectrum of compound CbPyCN.

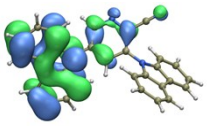
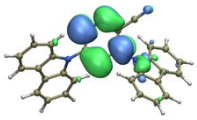
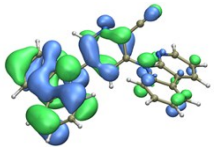
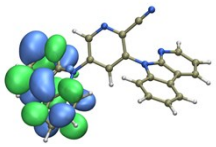
	HOMO-1	LUMO+1
CzPyCN		
CbPyCN		

Figure S5 Spatial distributions of HOMO-1 and LUMO+1.

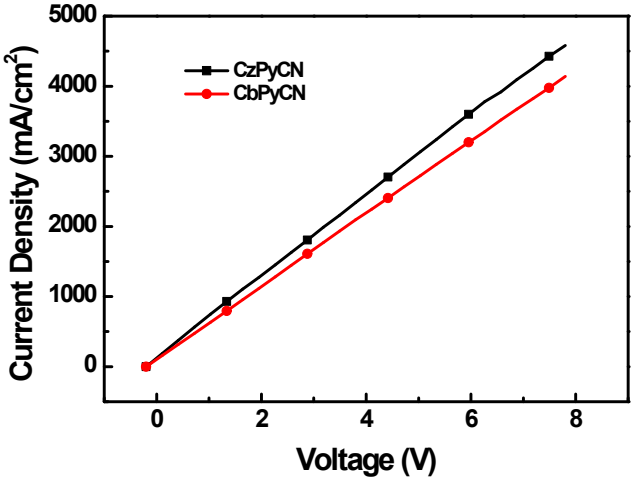


Figure S6. The current-voltage characteristics of hole-only devices for the relevant compounds CzPyCN and CbPyCN with device structure of ITO/PEDOT:PSS/Active Layer/Au.

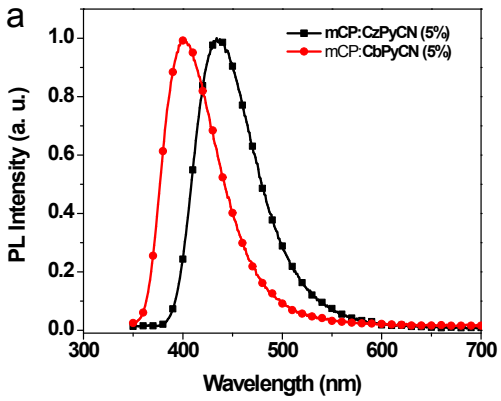


Figure S7. Normalized PL spectra (a) and decay curves (b) of mCP:CzPyCN (5%) and mCP:CzPyCN (5%) in film state at ambient temperature.

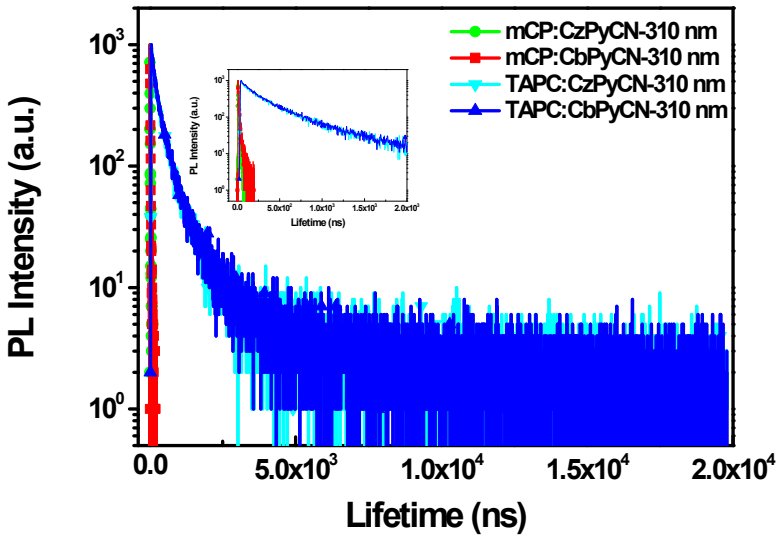


Figure S8 PL decay curves of mCP:CzPyCN (5 wt%), mCP:CzPyCN (5 wt%), TPAC:CzPyCN (1:1 wt%) and TPAC:CzPyCN (1:1 wt%) blends at ambient temperature, onset is the enlarged part with 310 nm LED excitation source.

Table S1 Fitted lifetime for mCP:CzPyCN (5 wt%), mCP:CzPyCN (5 wt%), TPAC:CzPyCN (1:1 wt%) and TPAC:CzPyCN (1:1 wt%) blends at ambient temperature

	τ1 (ns)/(%)	τ2 (ns)/(%)
mCP:CzPyCN	3.72/36.14	10.5/63.86
mCP:CbPyCN	5.00/48.10	20.07/51.90
TAPC:CzPyCN	262.31/65.44	1093.05 /34.56
TAPC:CbPyCN	299/68.70	1277/31.3