Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information

Understanding the Degradation Mechanism of TTA-based Blue Fluorescent OLEDs by Exciton Dynamics and Transient Electroluminance Measurements

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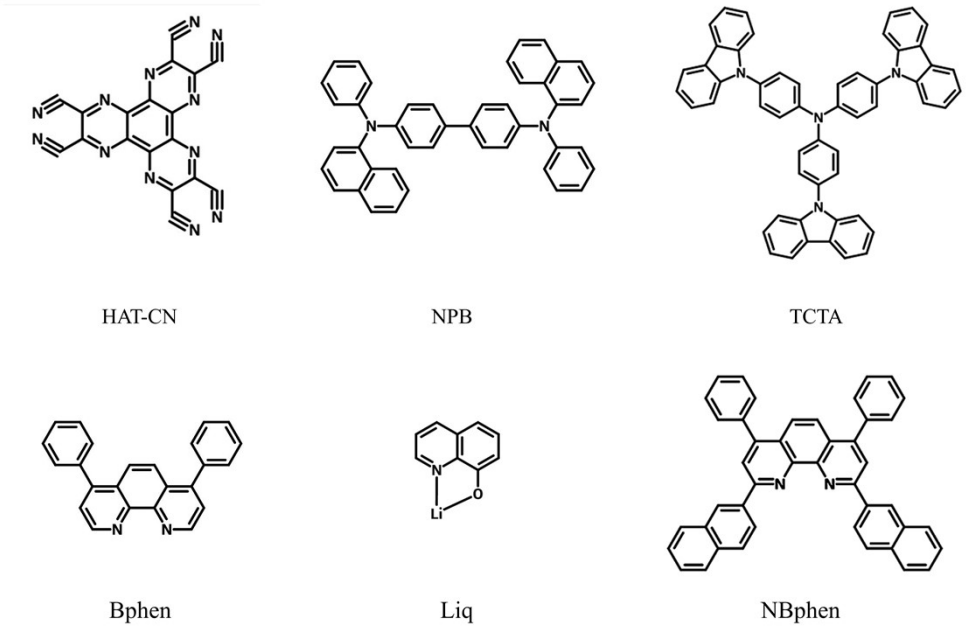

Fig. S1: Molecular structures of the organic materials used in this work.

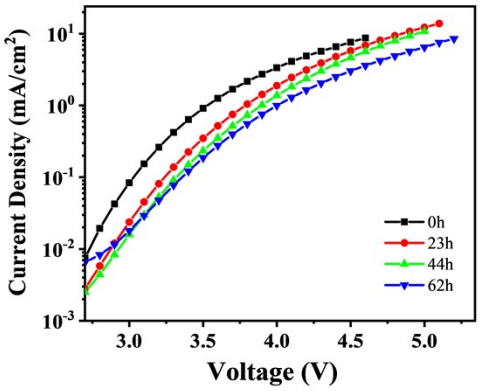

Fig. S2: Current density-voltage (J-V) characteristics of the resulting CzPA:BD doped blue fluorescent OLEDs aged for 0 hr (pristine), 23 hrs, 44 hrs and 62 hrs, respectively. As aging time increases, operating voltages at the same current densities increase, indicating that the charge transportation of the devices deteriorates during aging.

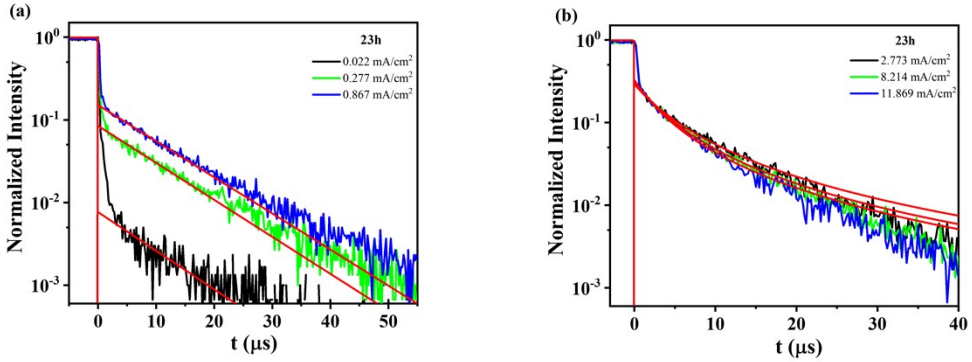

Fig. S3: Transient EL characteristics of the resulting CzPA:BD doped blue fluorescent OLEDs tested at aging time of 23 hrs (a) at low current density, and (b) at high current density.

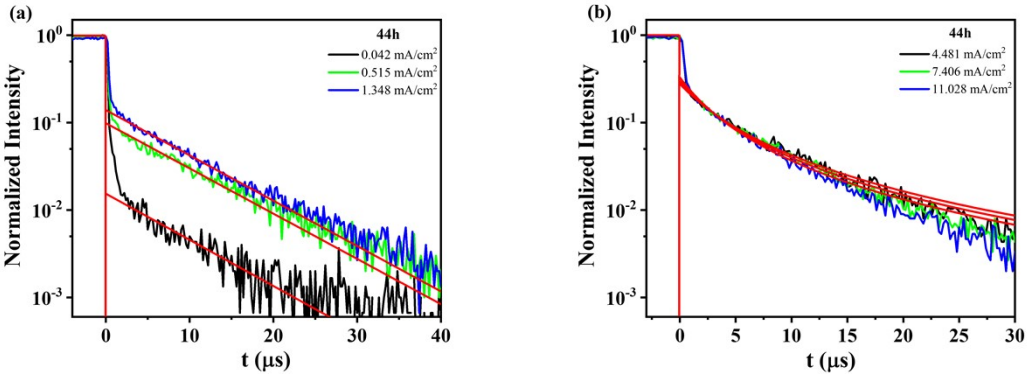

Fig. S4: Transient EL characteristics of the resulting CzPA:BD doped blue fluorescent OLEDs tested at aging time of 44 hrs (a) at low current density, and (b) at high current density.

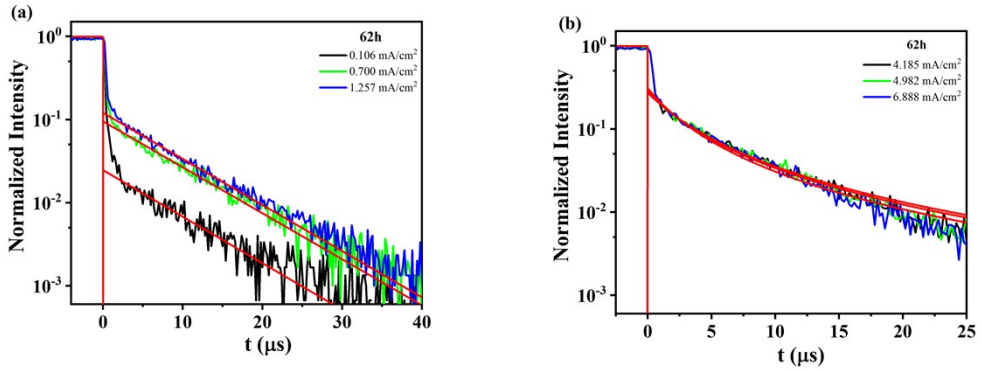

Fig. S5: Transient EL characteristics of the resulting CzPA:BD doped blue fluorescent OLEDs tested at aging time of 62 hrs (a) at low current density, and (b) at high current density.

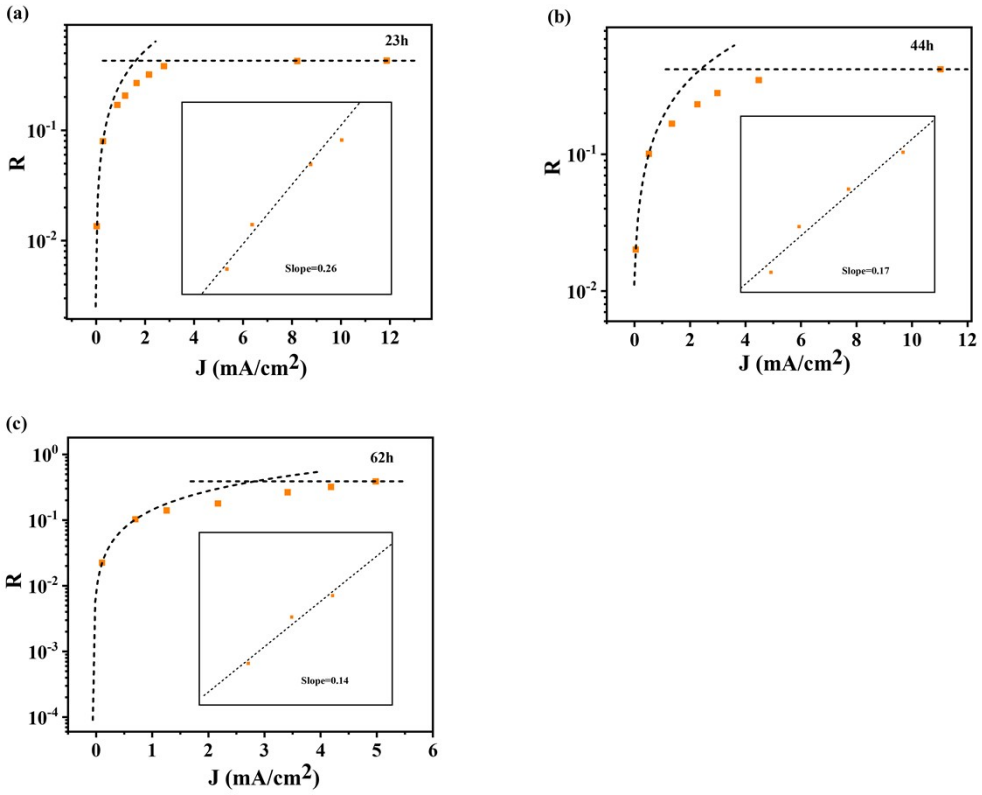

Fig. S6: R-J characteristics of the resulting CzPA:BD doped blue fluorescent OLEDs at aging times of (a) 23 hrs, (b) 44 hrs and (c) 62 hrs, respectively. The inserted graphs show the slopes of R-J curves at low current density.

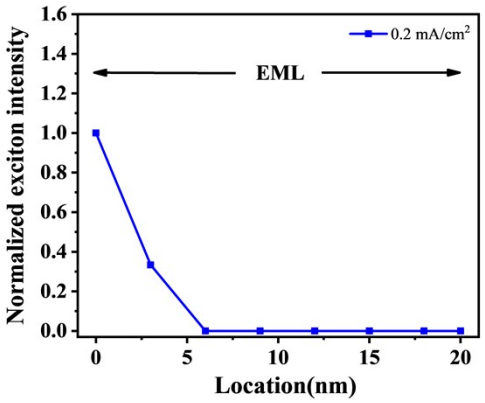

Fig. S7: Relative exciton distribution in the EML of the resulting CzPA:BD doped blue fluorescent OLEDs at the current density of 0.2 mA/cm^2, respectively. x=0 represents the interface between the EBL and the EML, and x=20 nm represents the interface between the EML and the ETL.

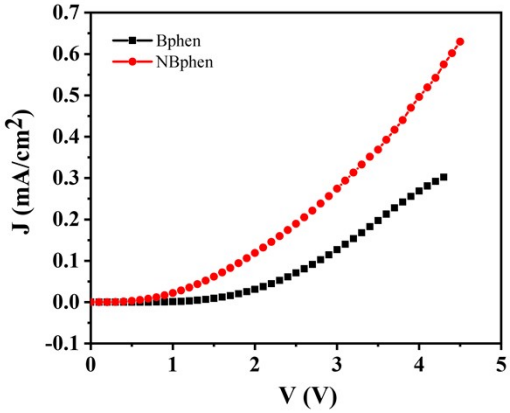

Fig. S8: J-V characteristics of the electron-only devices with Bphen and NBphen, respectively. The structure of the devices is ITO/ Al (5 nm)/ Liq (10 nm)/ Bphen or NBphen (40 nm)/ Liq (1.5 nm)/ Al. The 5-nm Al layer besides ITO is used to prevent holes from being injected from cathode into organic layers.