Supporting Information

TITLE: High Performance Red Phosphorescent Organic Electroluminescent Devices with Characteristic Mechanisms by Utilizing Terbium or Gadolinium Complex as Sensitizer

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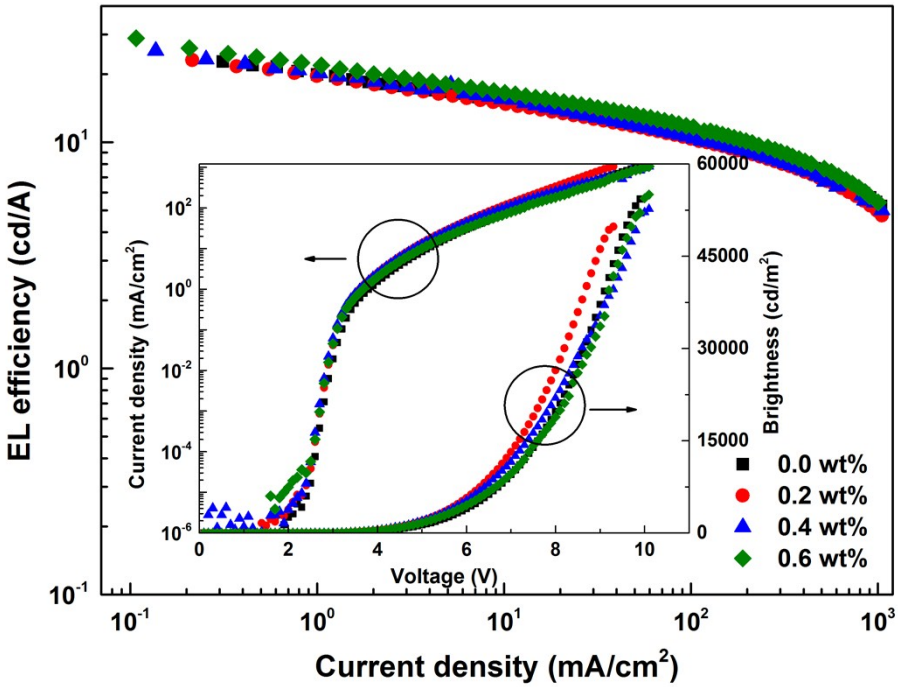

Figure S1. EL efficiency-current density (η-J) characteristics of co-doped devices based on mCPPO1 with $Tb(acac)_3(phen\text{-}Cl)$ at different co-doping concentrations. Insert: Brightness-current density-voltage (B-J-V) characteristics of co-doped devices based on mCPPO1 with $Tb(acac)_3(phen\text{-}Cl)$ at different co-doping concentrations.

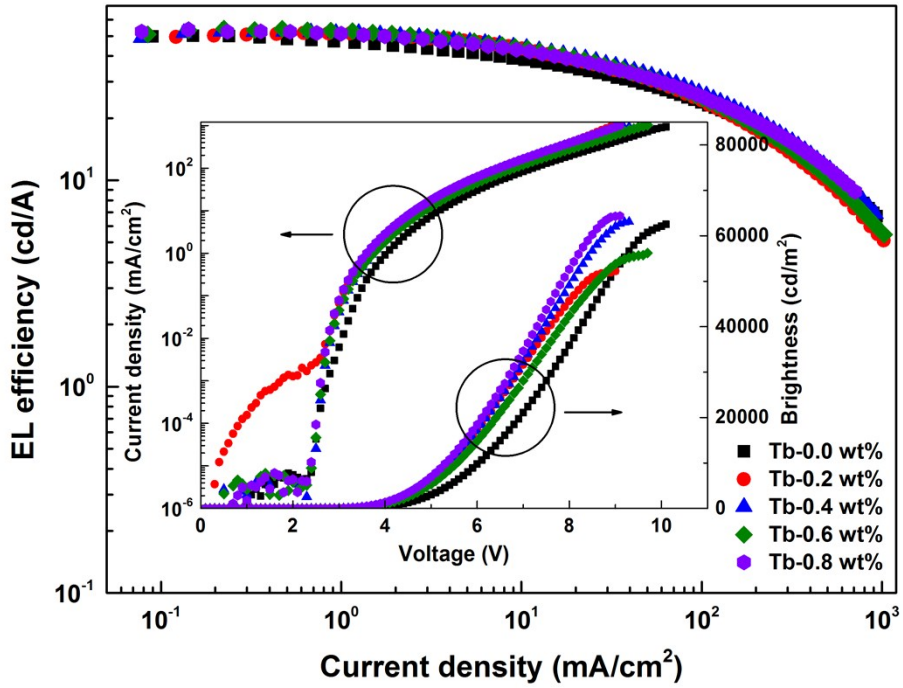

Figure S2. EL efficiency-current density (η-J) characteristics of co-doped single-EML devices based on 26DCzPPy with $Tb(acac)_3(phen\text{-}Cl)$ at different co-doping concentrations. Insert: Brightness-current density-voltage (B-J-V) characteristics of co-doped single-EML devices based on 26DCzPPy with $Tb(acac)_3(phen\text{-}Cl)$ at different co-doping concentrations.

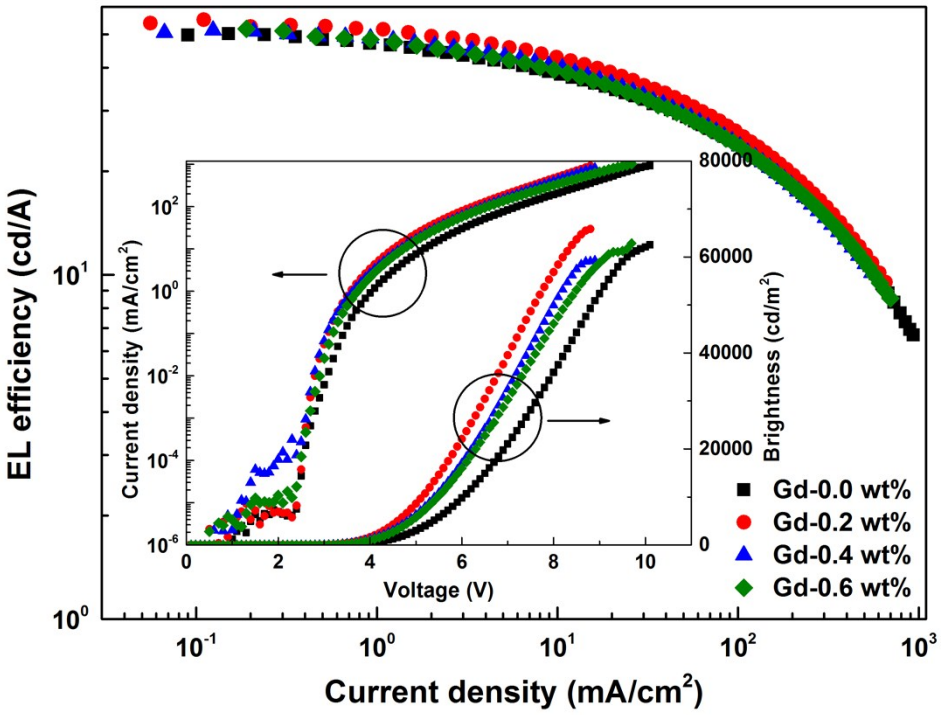

Figure S3. EL efficiency-current density (η-J) characteristics of co-doped single-EML devices based on 26DCzPPy with Gd(TTA)$_3$phen at different co-doping concentrations. Insert: Brightness-current density-voltage (B-J-V) characteristics of co-doped single-EML devices based on 26DCzPPy with Gd(TTA)$_3$phen at different co-doping concentrations.

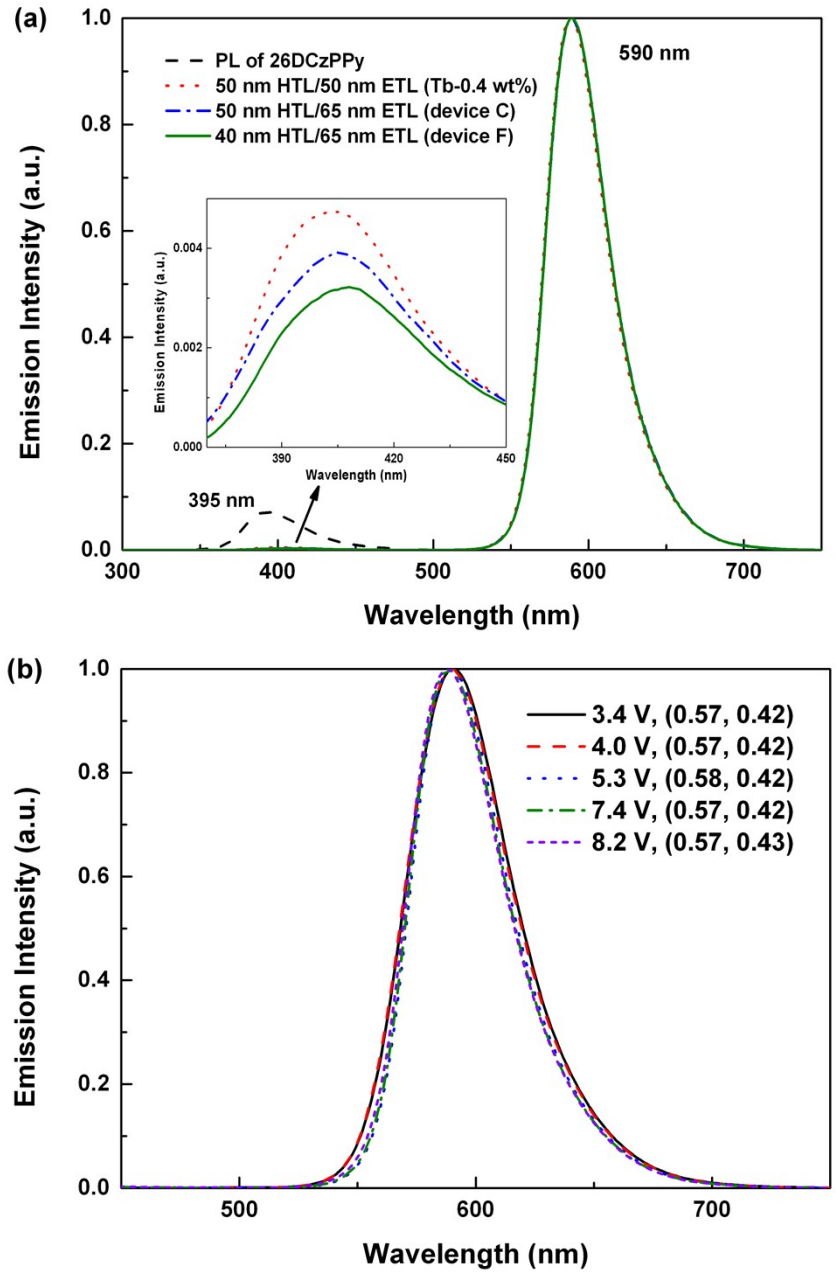

Figure S4. (a) Normalized PL spectra of 26DCzPPy and EL spectra of $Tb(acac)_3(phen\text{-}Cl)$ co-doped devices with 50 nm HTL/50 nm ETL (Tb-0.4 wt%), 50 nm HTL/65 nm ETL (device C), and 40 nm HTL/65 nm ETL (device F) at the current density of 10 mA/cm^2. Insert: Comparison of the relative intensity of 26DCzPPy emission in these devices. (b) Normalized EL spectra and CIE coordinates of device D with increasing operation voltage.