Supporting Information

Novel Carbazol-Pyridine-Carbonitrile Derivative as Excellent Blue Thermally Activated Delayed Fluorescence Emitter for Highly Efficient Organic Light-Emitting Devices

Wei Liu[§†], *Cai-Jun Zheng**[§], *Kai Wang* [§‡], *Zhan Chen* [§‡], *Dong-Yang Chen*[§‡], *Fan Li*[§], *Xue-Mei Ou*[§], *Yu-Ping Dong**[†], *and Xiao-Hong Zhang**[§#]

[§]Nano-organic Photoelectronic Laboratory and Key Laboratory of Photochemical Conversion and Optoelectronic Materials, Technical Institute of Physics and Chemistry, Chinese Academy of Sciences, Beijing, 100190, P. R. China, E-mail: xhzhang@mail.ipc.ac.cn, zhengcaijun@mail.ipc.ac.cn

[†]College of Materials Science and Engineering, Beijing Institute of Technology, Beijing, 100081, P. R. China, E-mail: chdongyp@bit.edu.cn

[‡]University of the Chinese Academy of Sciences, Beijing, 100039, P. R. China

[#]Functional Nano & Soft Materials Laboratory (FUNSOM) and Collaborative Innovation Center of Suzhou Nano Science and Technology, Soochow University, Suzhou, Jiangsu 215123, P.R. China

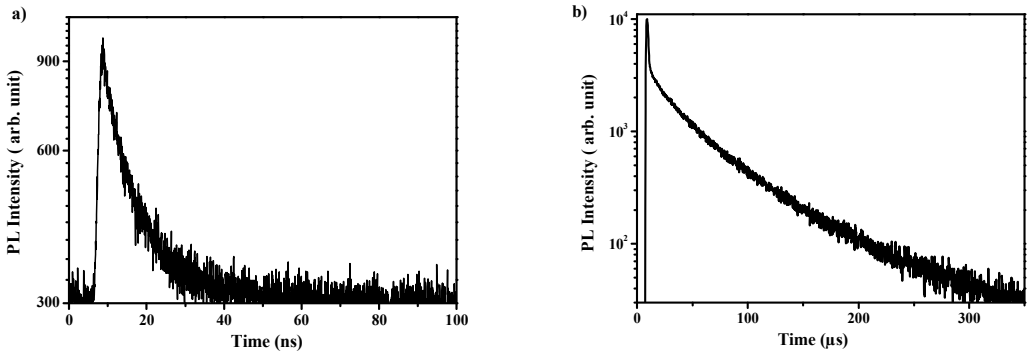


Figure S1. a) Transient PL decay curve of 13 wt% CPC doped mCP film in time range of 100 ns and b) 350 μs at room temperature. (Excitation wavelength was 300 nm.)

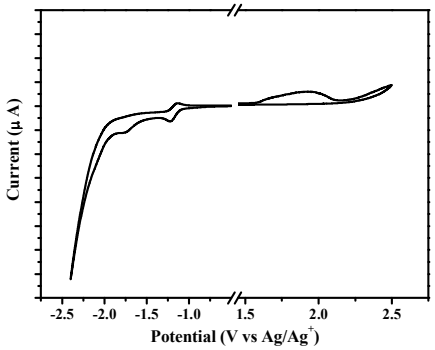


Figure S2. Cyclic voltammograms of CPC in acetonitrile.

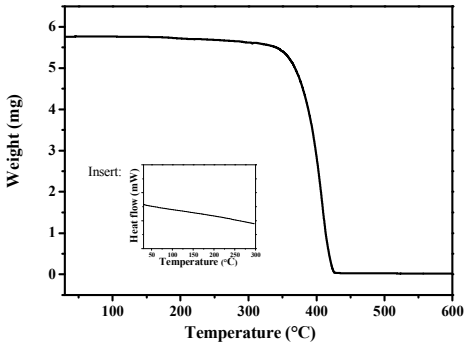
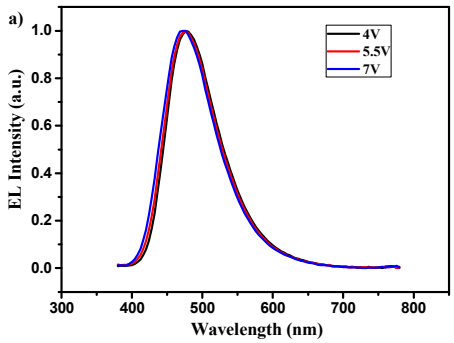
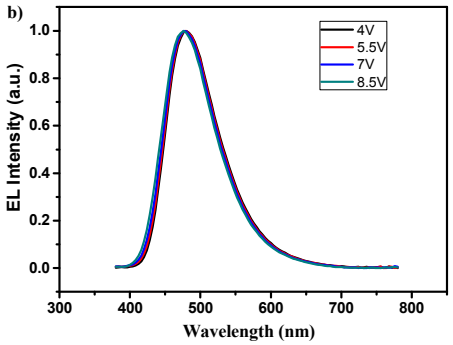
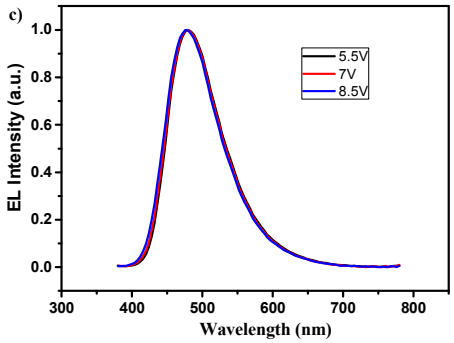
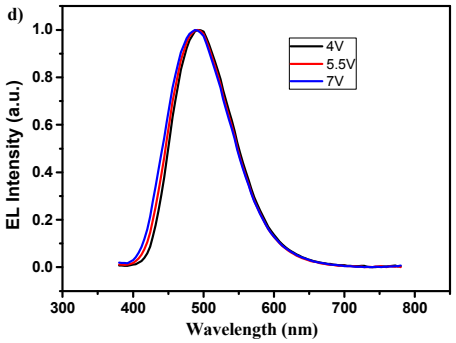


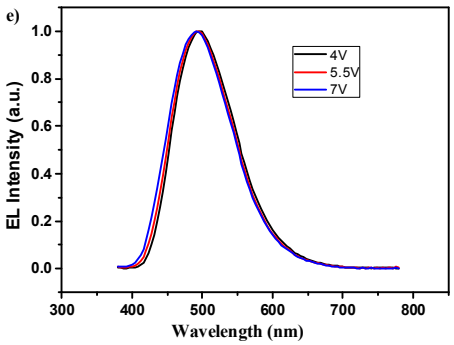
Figure S3. TGA and DSC (insert) thermograms of CPC.

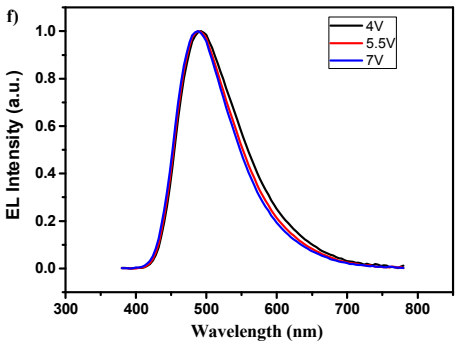

a)
EL Intensity (a.u.)
Wavelength (nm)
4V
5.5V
7V

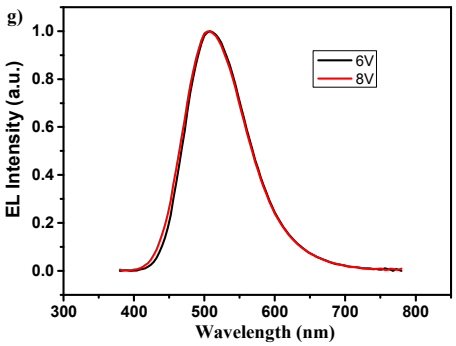

b)
EL Intensity (a.u.)
Wavelength (nm)
4V
5.5V
7V
8.5V

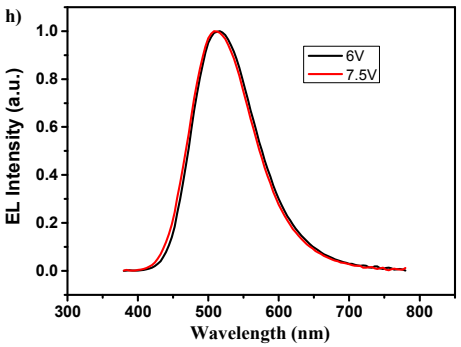

c)
EL Intensity (a.u.)
Wavelength (nm)
5.5V
7V
8.5V


d)
EL Intensity (a.u.)
Wavelength (nm)
4V
5.5V
7V


e)
EL Intensity (a.u.)
Wavelength (nm)
4V
5.5V
7V


f)
EL Intensity (a.u.)
Wavelength (nm)
4V
5.5V
7V


g)
EL Intensity (a.u.)
Wavelength (nm)
6V
8V


h)
EL Intensity (a.u.)
Wavelength (nm)
6V
7.5V

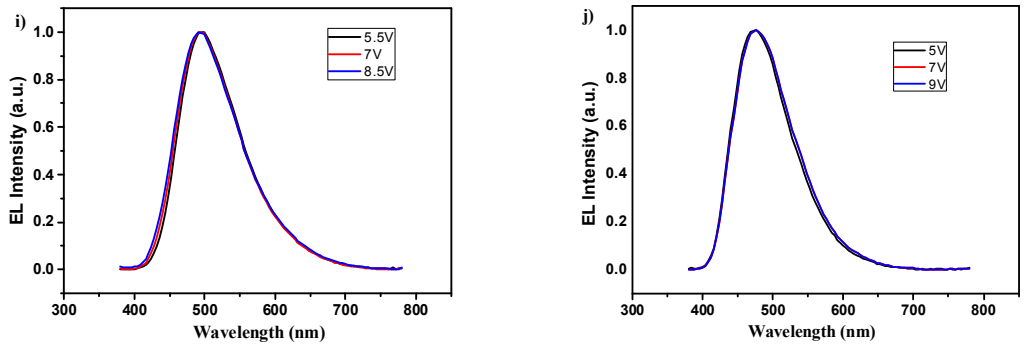


Figure S4. The normalized EL spectra of the devices at different bias voltage with mCP host with different dopant concentrations: a) 5 wt %, b) 7 wt %, c) 9 wt %, d) 11 wt %, e) 13 wt %, f) 15 wt %, g) 30 wt % h) 50 wt %, and the optimized devices with host of i) 26DCZPPY and g) DPEPO.

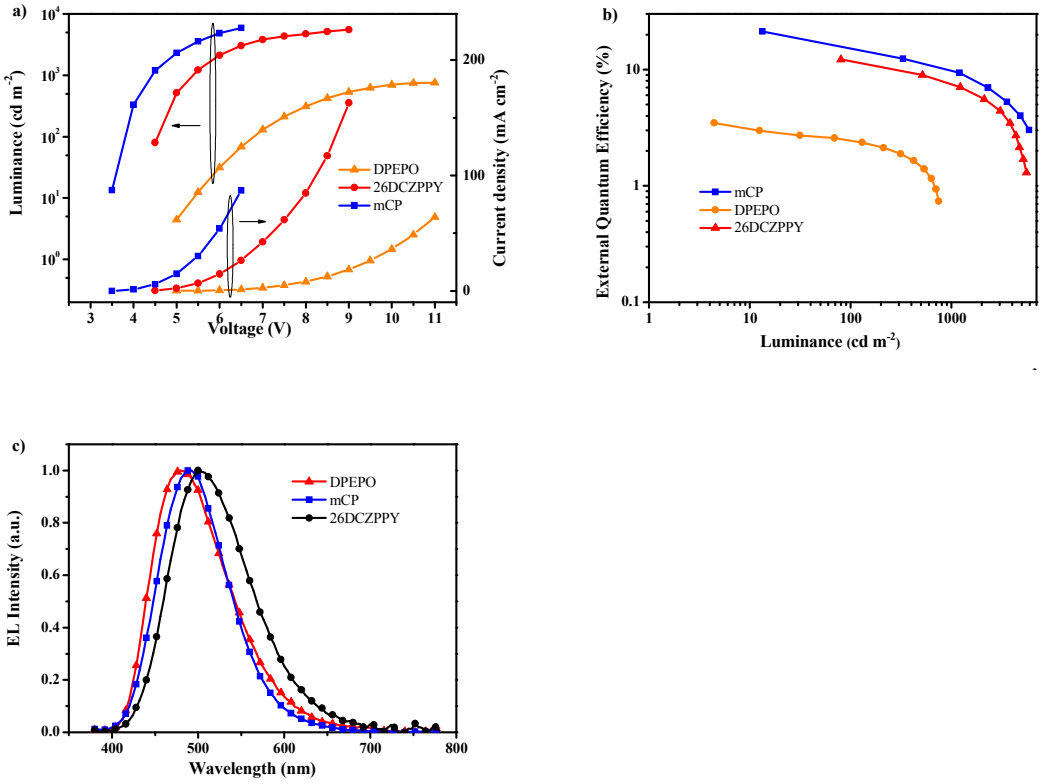


Figure S5. a) Voltage-luminance-current density characteristics, b) Luminance–EQE plots, c) The EL spectra of OLEDs based on CPC doped in different hosts with the structure of ITO/TAPC (40 nm)/TCTA (5 nm)/host:13 wt % CPC (20 nm)/TmPyPB (40 nm)/LiF (0.8 nm)/Al

Table S1. Summary of CPC-based OLEDs performance with the structure of ITO/TAPC (40 nm)/TCTA (5 nm)/host:13 wt% CPC (20 nm)/TmPyPB (40 nm)/LiF (0.8 nm)/Al

Host	Doping Concentration (wt%)	V_{on} [a] (V)	EL_{max} [b] (nm)	EQE_{max} [c] (%)	CIE (x , y) at 500 cd m^{-2}
DPEPO	13	4.5	480	3.5	(0.19, 0.30)
26DCZPPY	13	3.8	504	12.2	(0.25, 0.42)

[a]Turn-on voltage, estimated at the brightness of 1 cd m^{-2}. [b]Maximum wavelength of EL. [c]Maximum external quantum efficiency.