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

Bulky Pyridinylfluorene-functionalizing Approach to Diarylfluorenes-based Bipolar Host Materials for Efficient Red, Green, Blue and White Electrophosphorescent Devices

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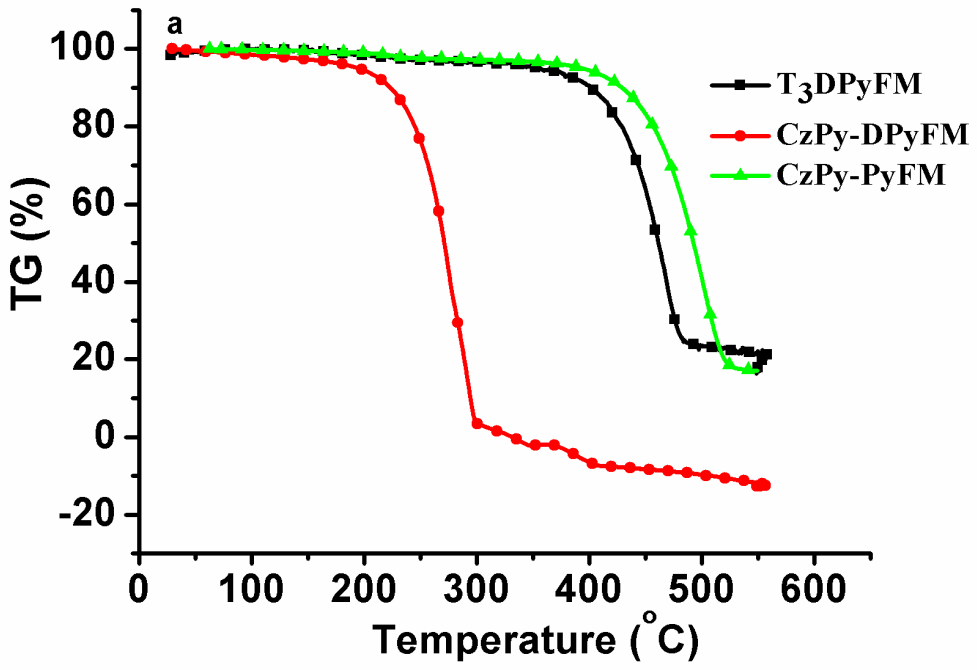
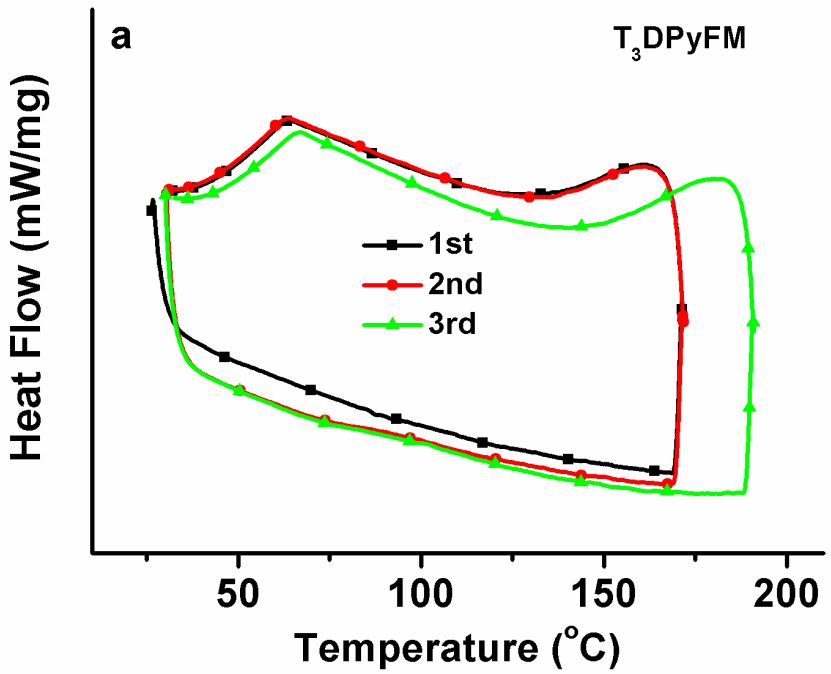
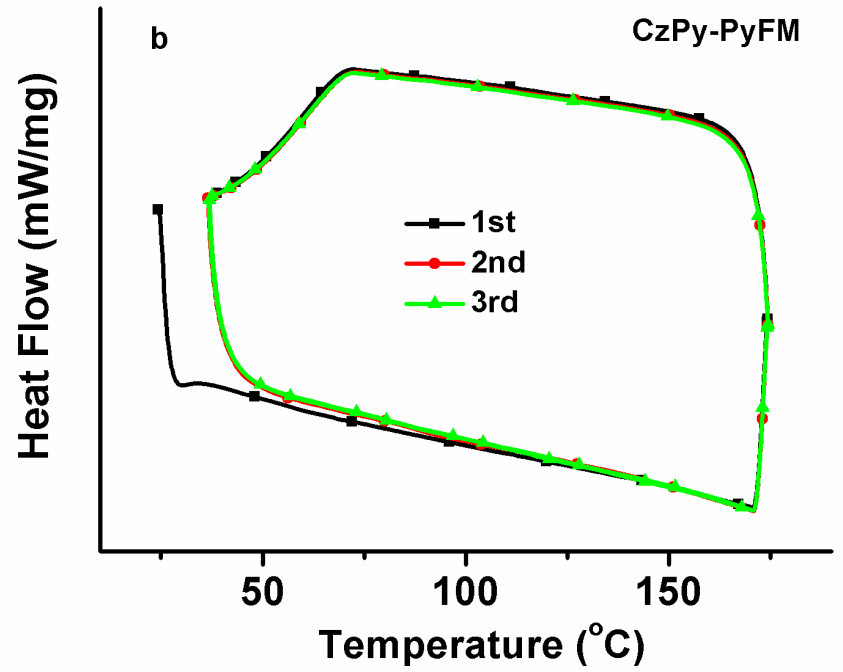

a
TG (%)
100
80
60
40
20
0
-20
0
100
200
300
400
500
600
Temperature (°C)
T3DPyFM
CzPy-DPyFM
CzPy-PyFM


a
T3DPyFM
Heat Flow (mW/mg)
1st
2nd
3rd
50
100
150
200
Temperature (°C)



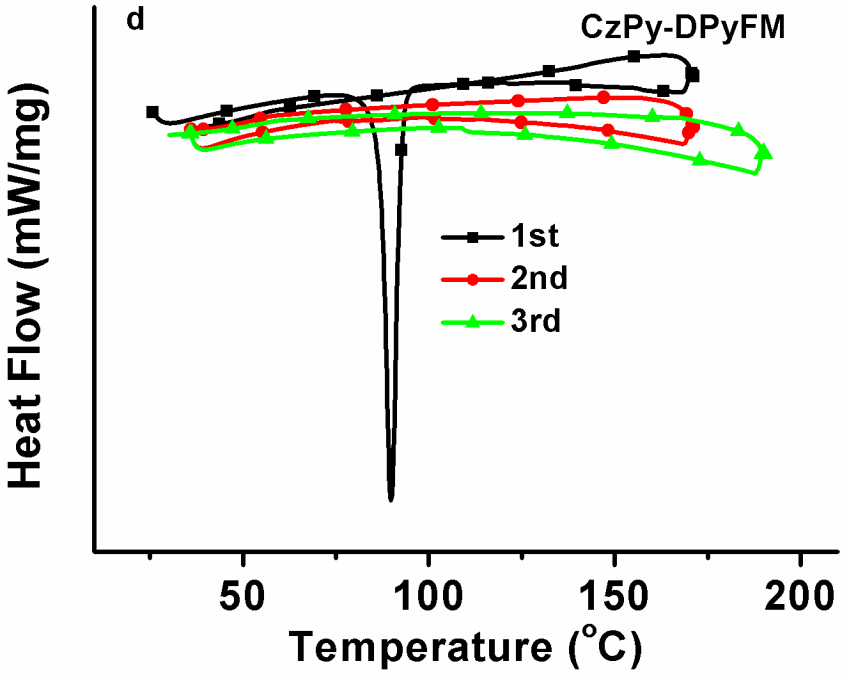


Fig. S1. TGA (a) and DSC (b-d) curves of the hosts in nitrogen atmosphere.

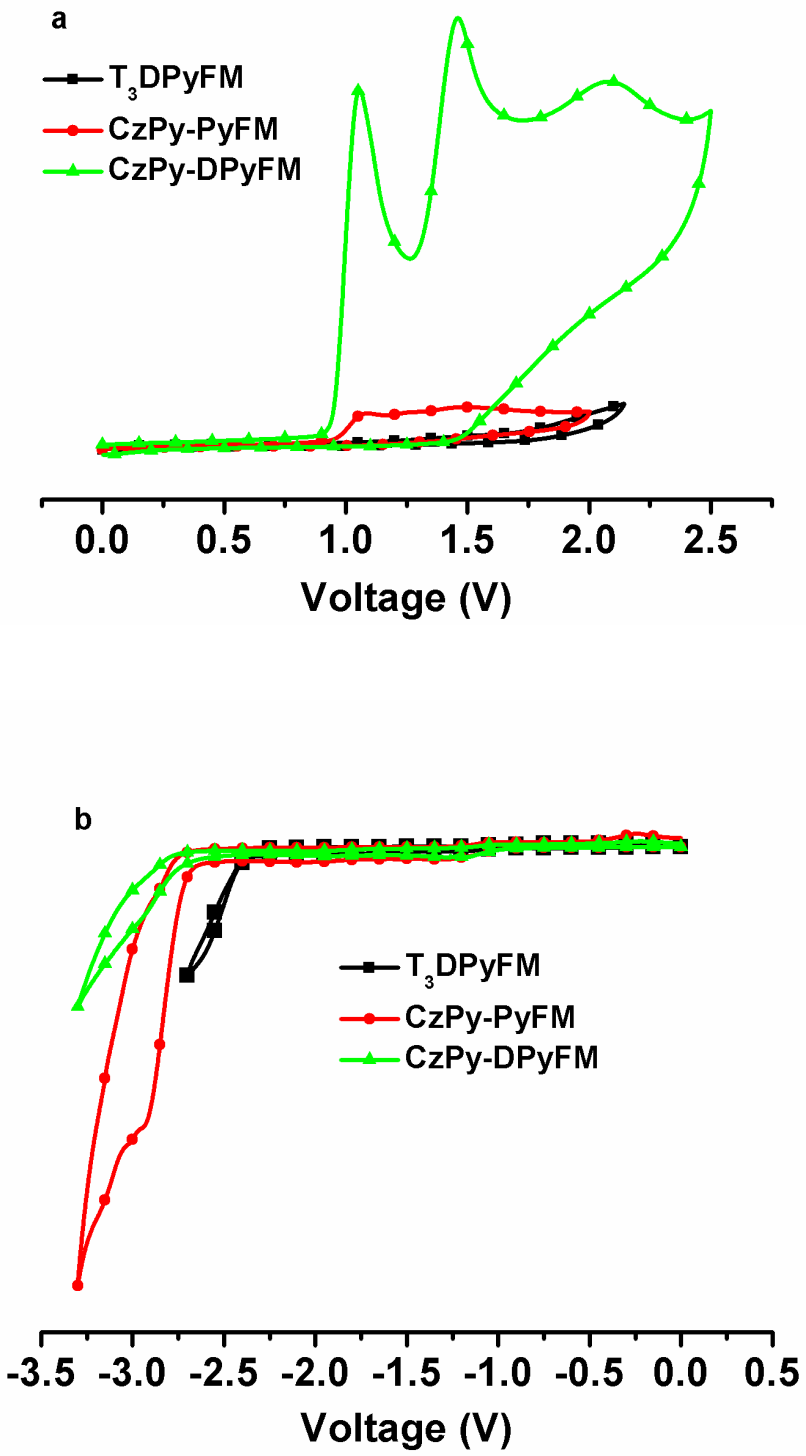


Fig. S2. Cyclic voltammogram of the three hosts measured with a scan rate of 100 mV s^{-1} in acetonitrile solutions (a: Oxide curves; b: Reductant curves).

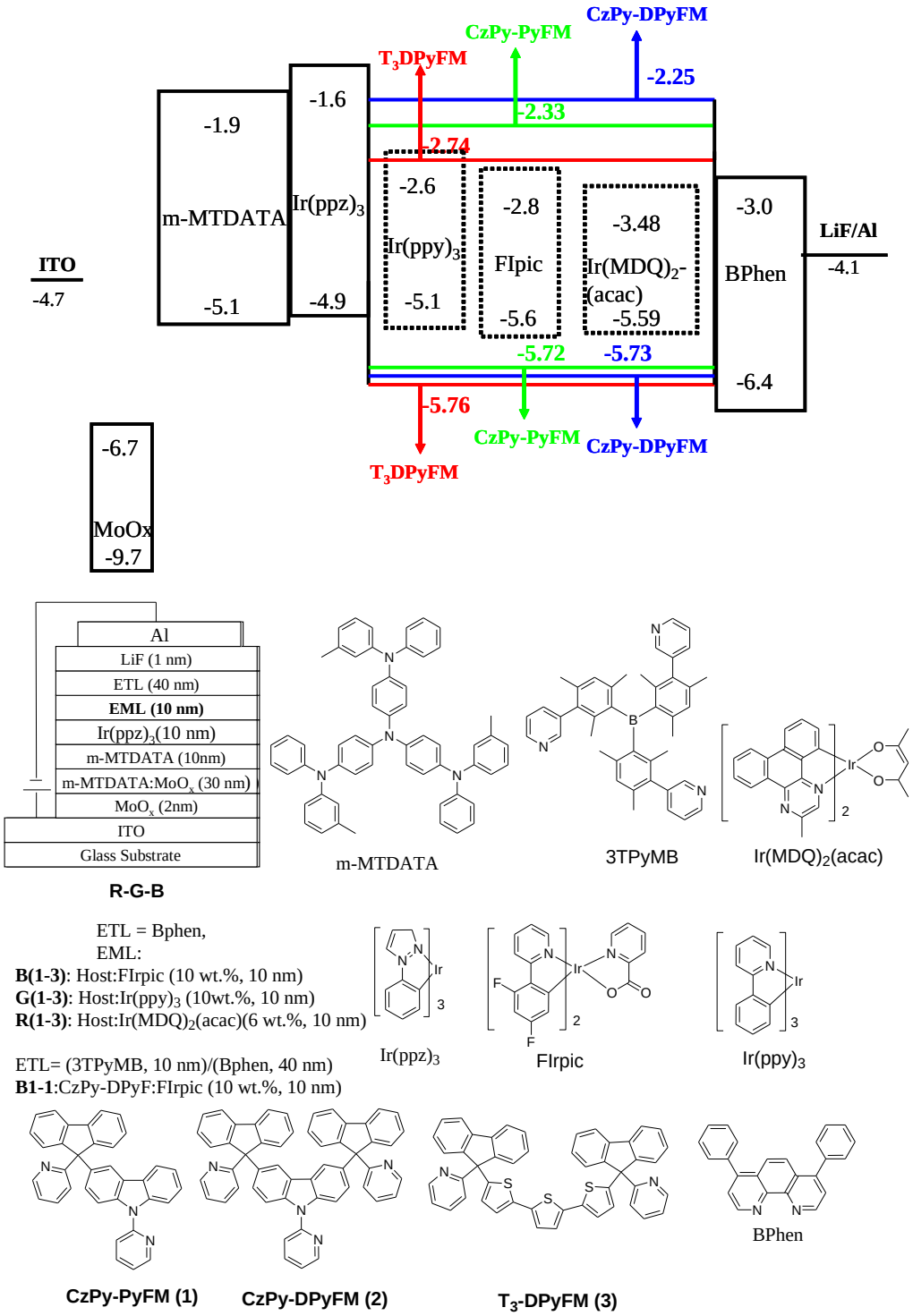


Fig. S3. Top):The energy level alignment diagram of the PhOLEDs (B-3, G1-3 and R1-3), Bottom): The structure for PhOLEDs and molecular structures of the used compounds used in these devices. Bphen (4,7-Diphenyl-1,10-diazaphen-anthrene); 3TPyMB (Tris(2,4,6-trimethyl-3-(pyridine-3-yl)phenyl)borane); **CzPy-PyFM**; **CzPy-DPyFM**; **T_3DPyFM**; m-MTDATA (4,4',4''-Tris(N-3-methyl-phenyl-N-pjenylamino)

triphenyl-amine); $Ir(ppy)_3$ (Tris(2-phenyl-pyridine)iridium(III)); $Ir(MDQ)_2(acac)$ (Bis(2-methyldibenzo [f, h]guinoxaline) (acetyl-acetonate)); FIrpic (Bis(4,6-difluoro-phenyl-pyridine) (picolinate)iridium(III)); ITO (indium tin oxide).

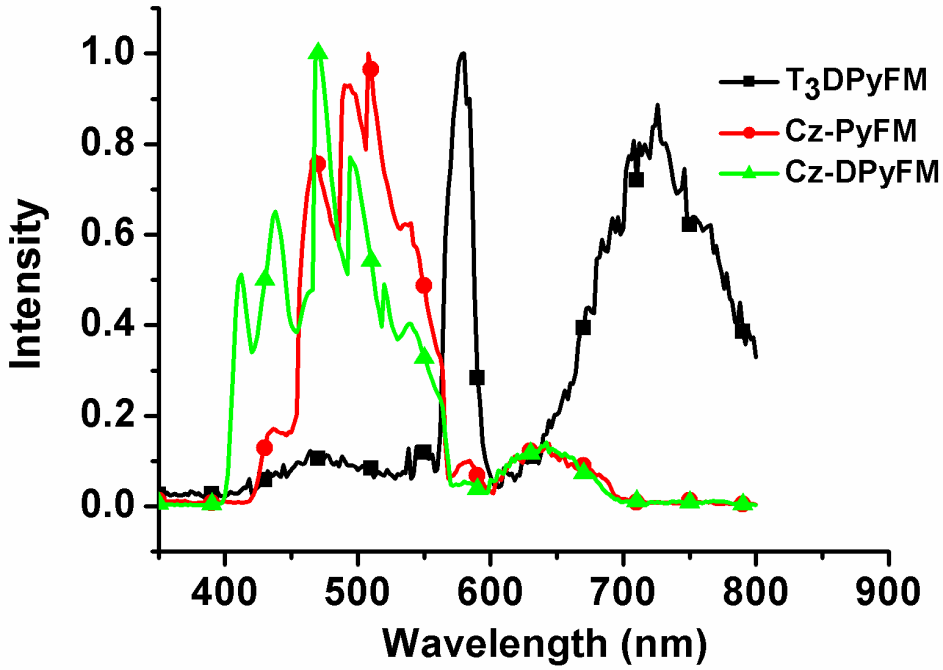
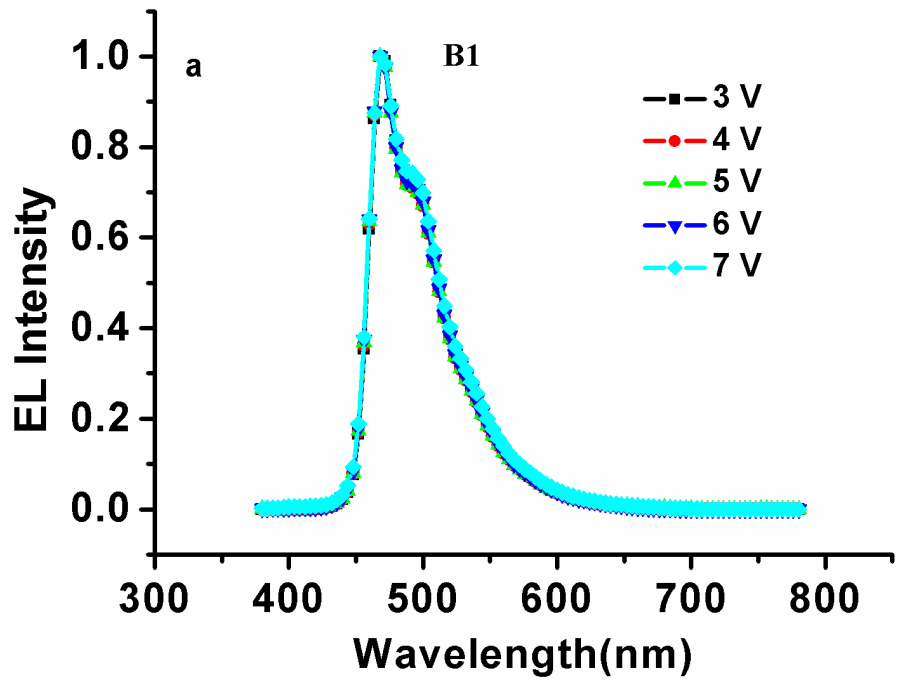
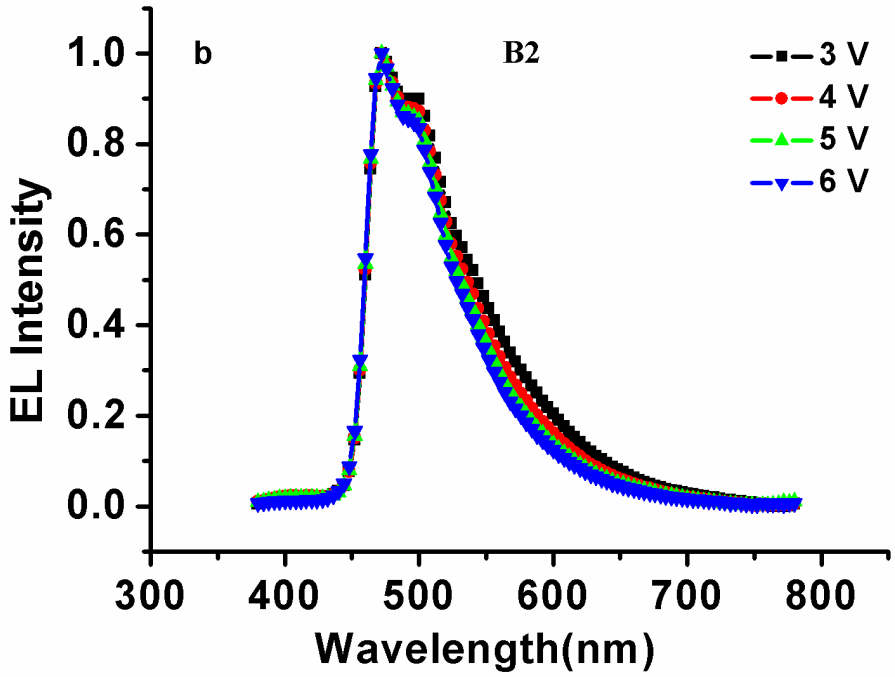
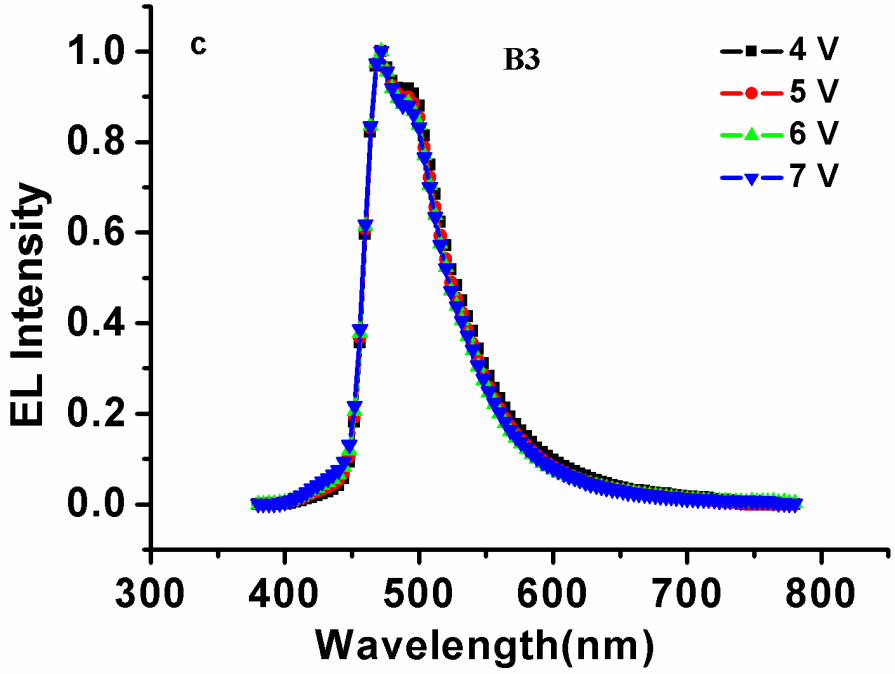
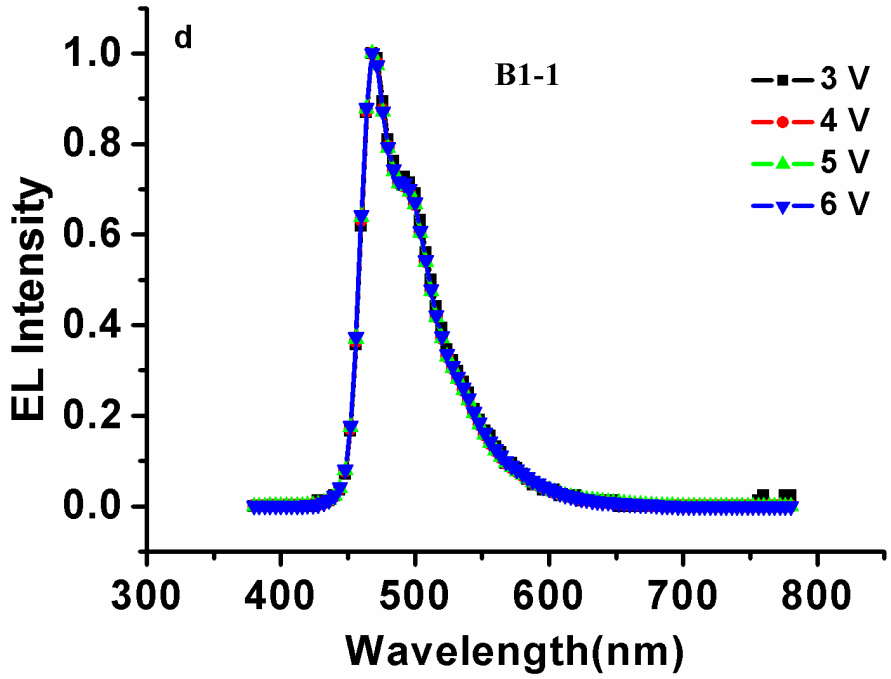


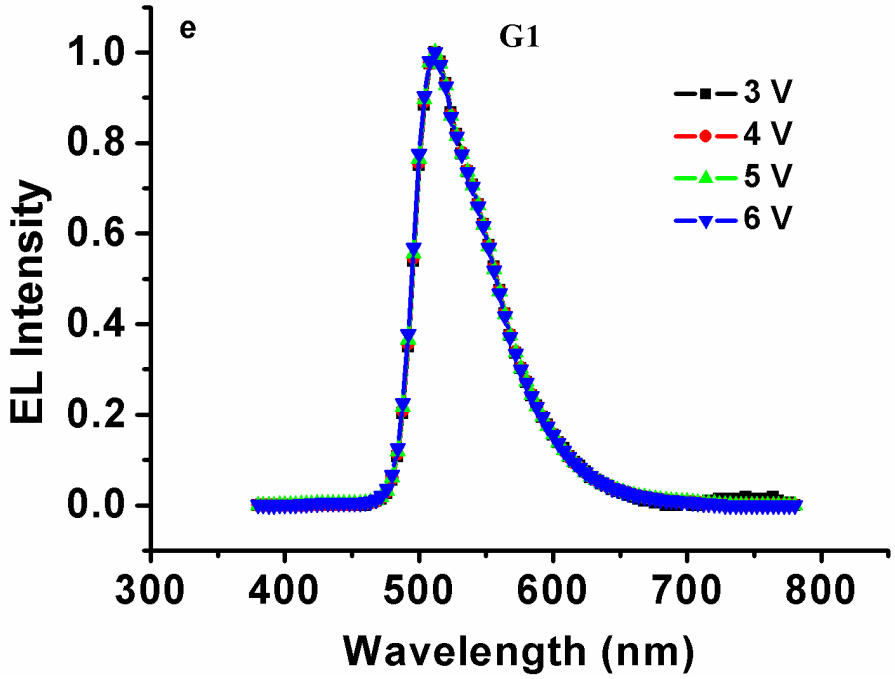
Fig. S4. Phosphorescence spectra of the three hosts measured at 77 K in CH_2Cl_2.

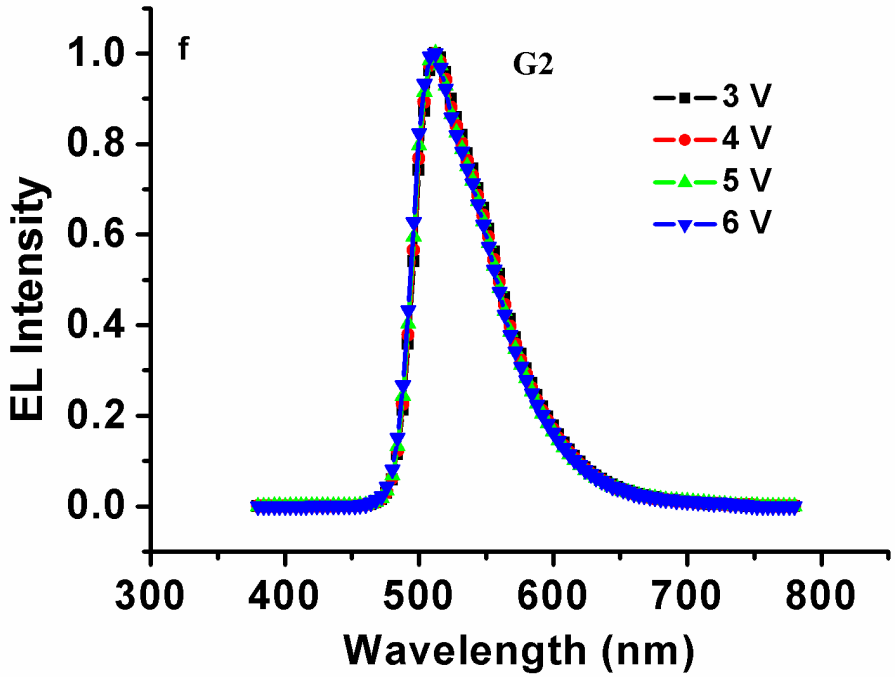


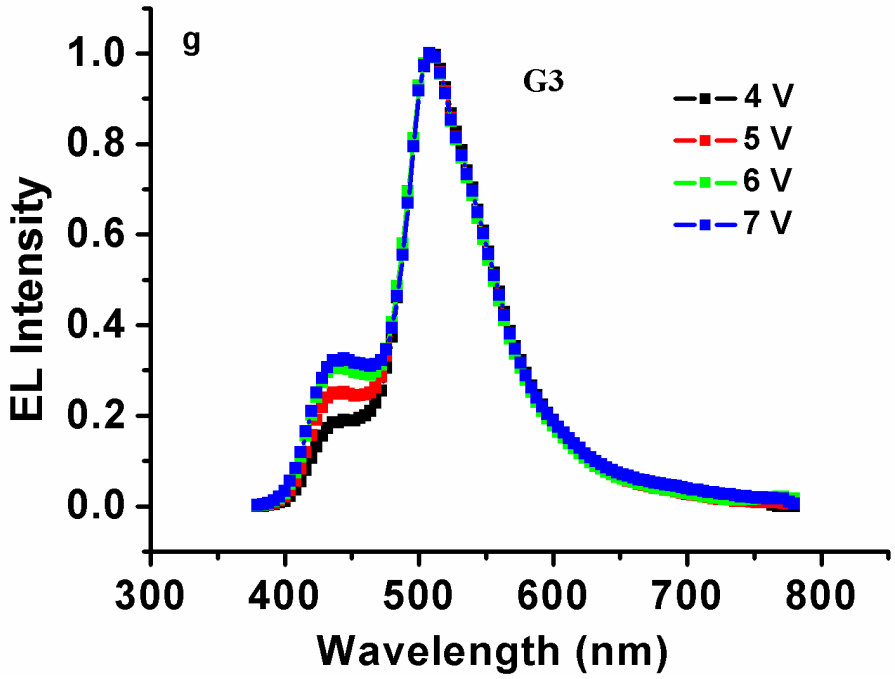

b
B2
3 V
4 V
5 V
6 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength(nm)

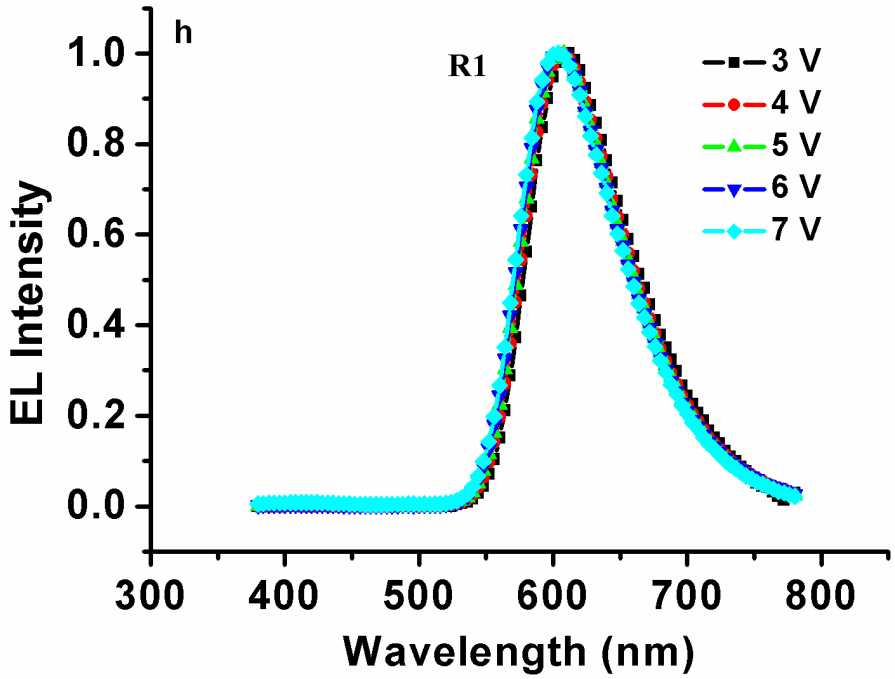

c
B3
4 V
5 V
6 V
7 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength(nm)

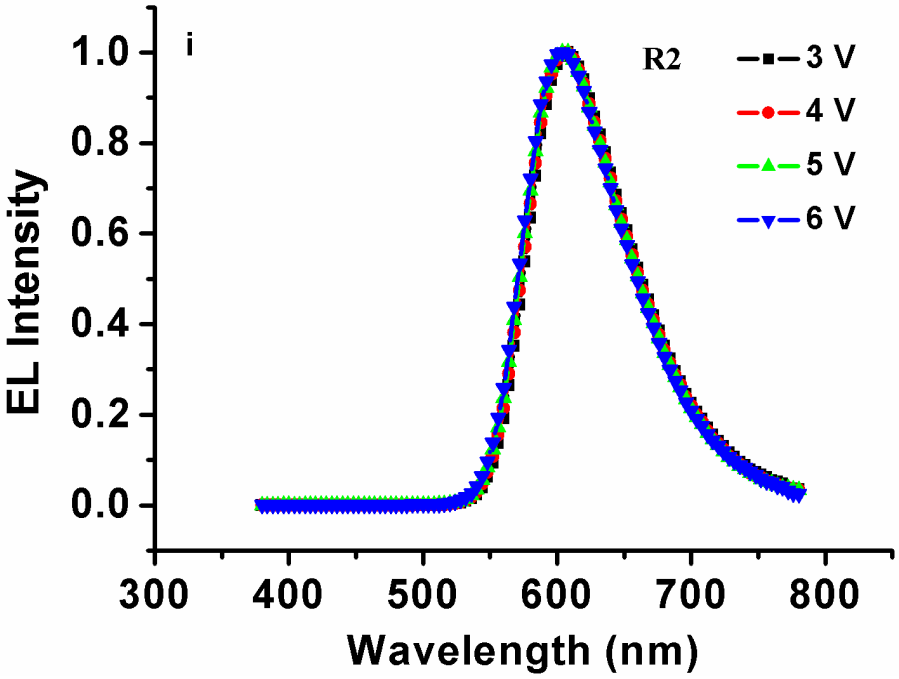

d
B1-1
3 V
4 V
5 V
6 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength(nm)

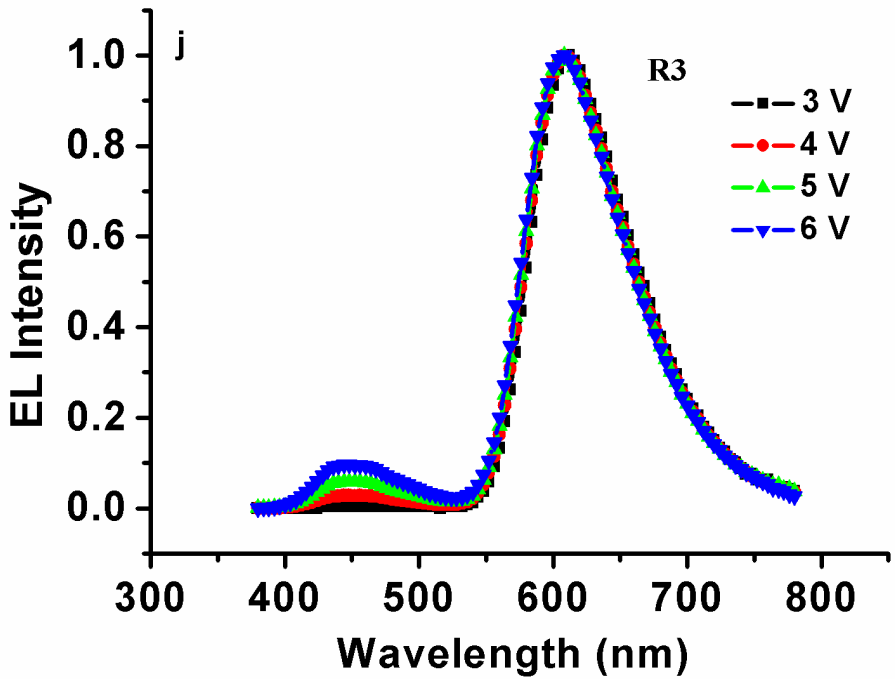

e
G1
3 V
4 V
5 V
6 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength (nm)


f
G2
3 V
4 V
5 V
6 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength (nm)


g
G3
4 V
5 V
6 V
7 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength (nm)


h
R1
3 V
4 V
5 V
6 V
7 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength (nm)


i
R2
3 V
4 V
5 V
6 V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength (nm)



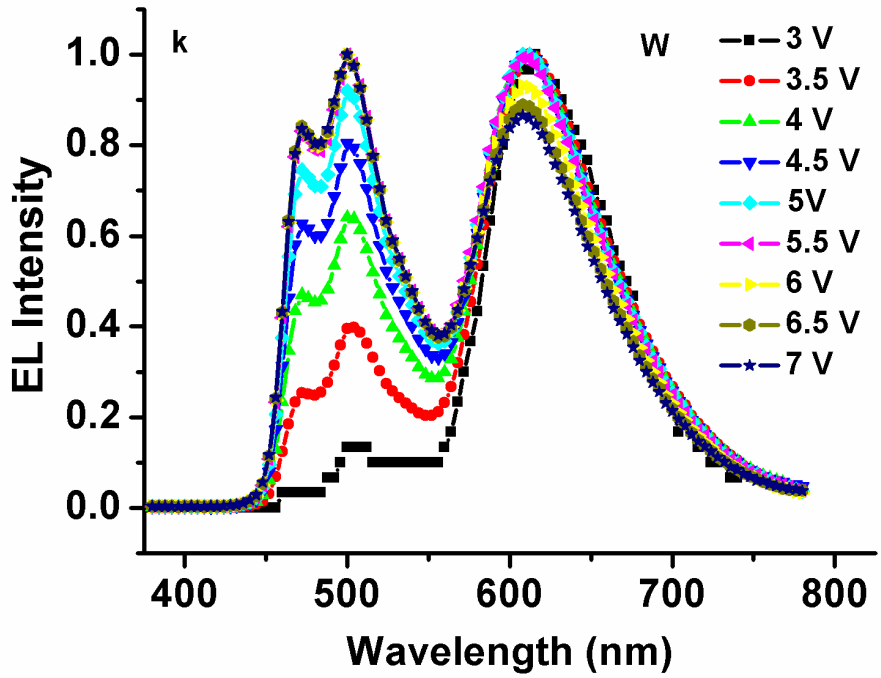
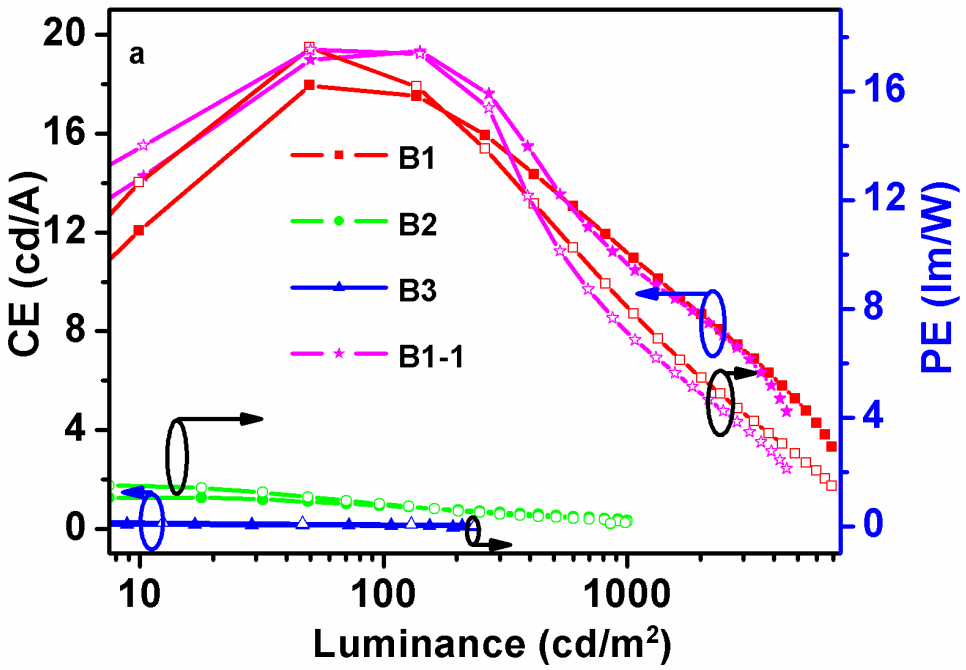
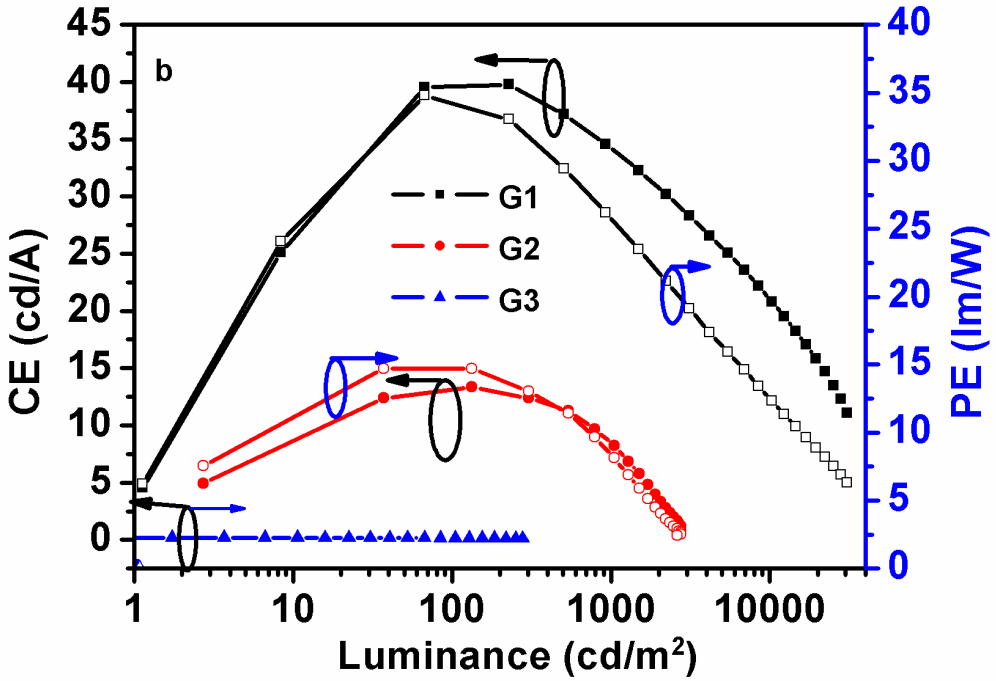


Fig. S5. The EL spectra of the blue, green, red and white devices at different driving voltages.


a
B1
B2
B3
B1-1
CE (cd/A)
PE (lm/W)
Luminance (cd/m²)
0
4
8
12
16
20
10
100
1000


b
G1
G2
G3
CE (cd/A)
PE (lm/W)
Luminance (cd/m²)
0
5
10
15
20
25
30
35
40
45
1
10
100
1000
10000

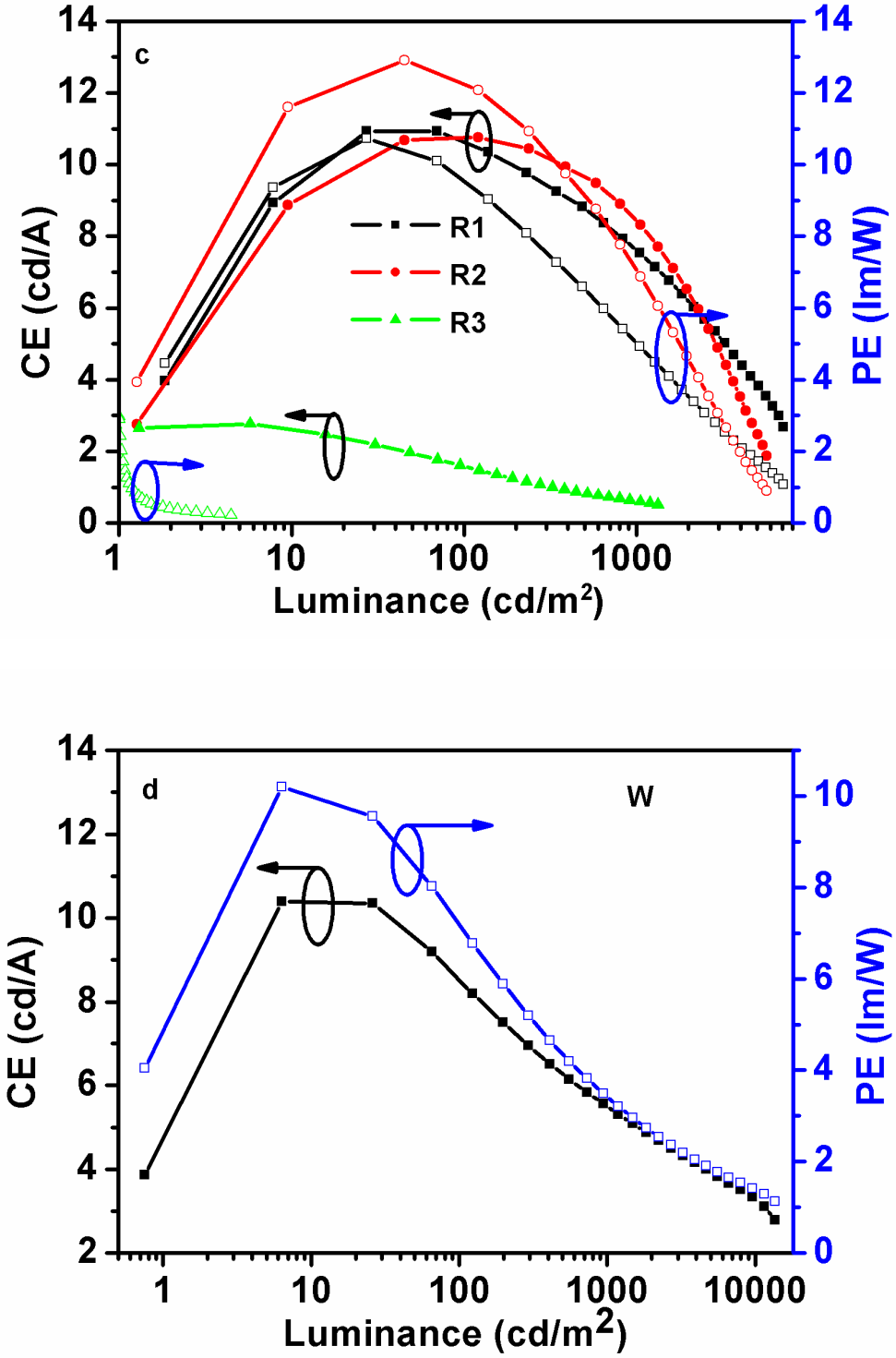
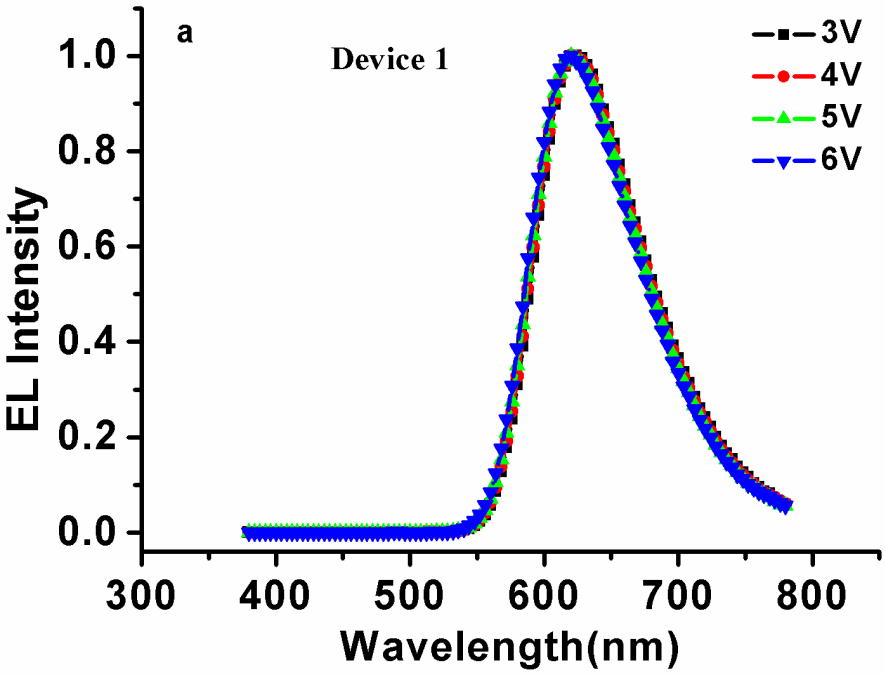
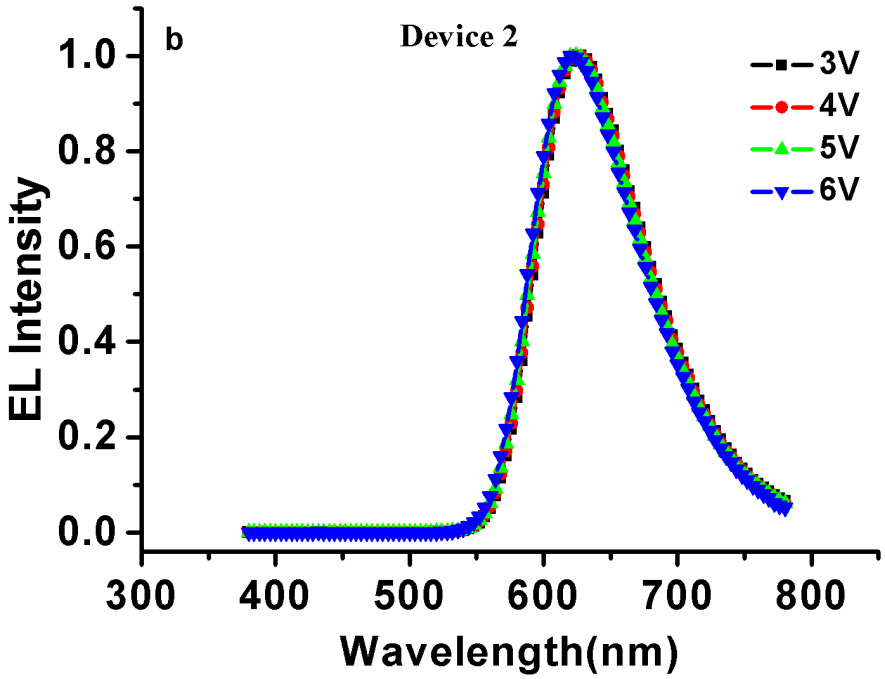
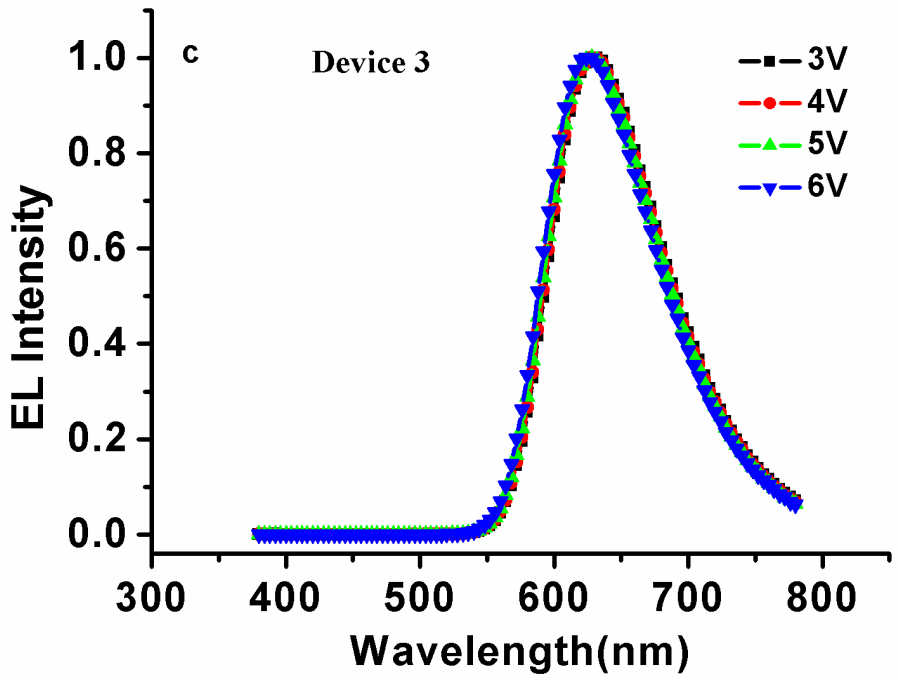
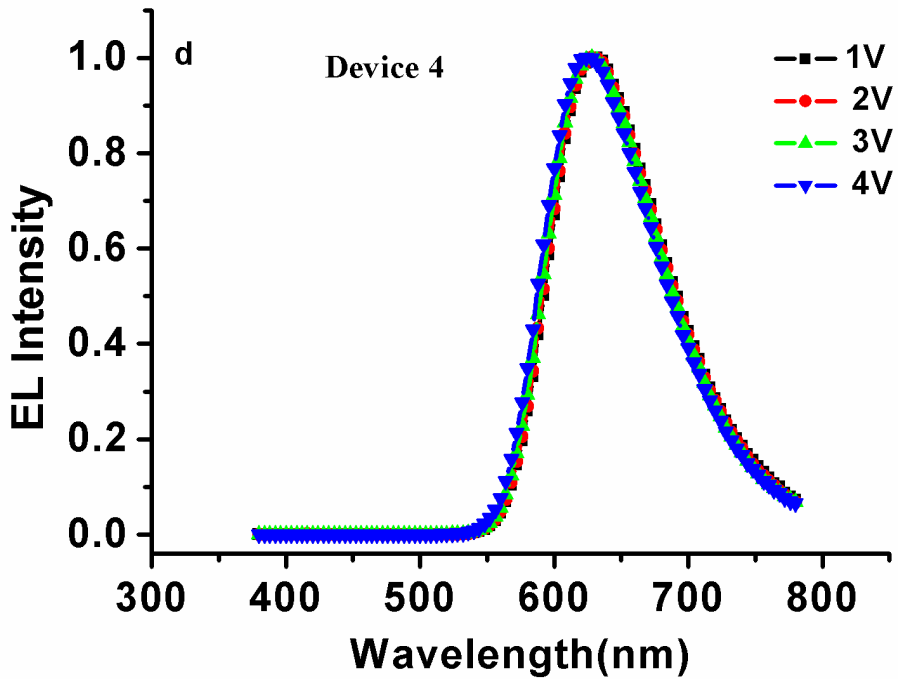


Fig. S6. Current efficiency (solid)–luminance–power efficiency (hollow) characteristics of the blue (a), green (b), red (c) and white (d) devices, respectively.


a
Device 1
3V
4V
5V
6V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength(nm)


b
Device 2
3V
4V
5V
6V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength(nm)


c
Device 3
3V
4V
5V
6V
EL Intensity
1.0
0.8
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength(nm)


d
Device 4
1V
2V
3V
4V
EL Intensity
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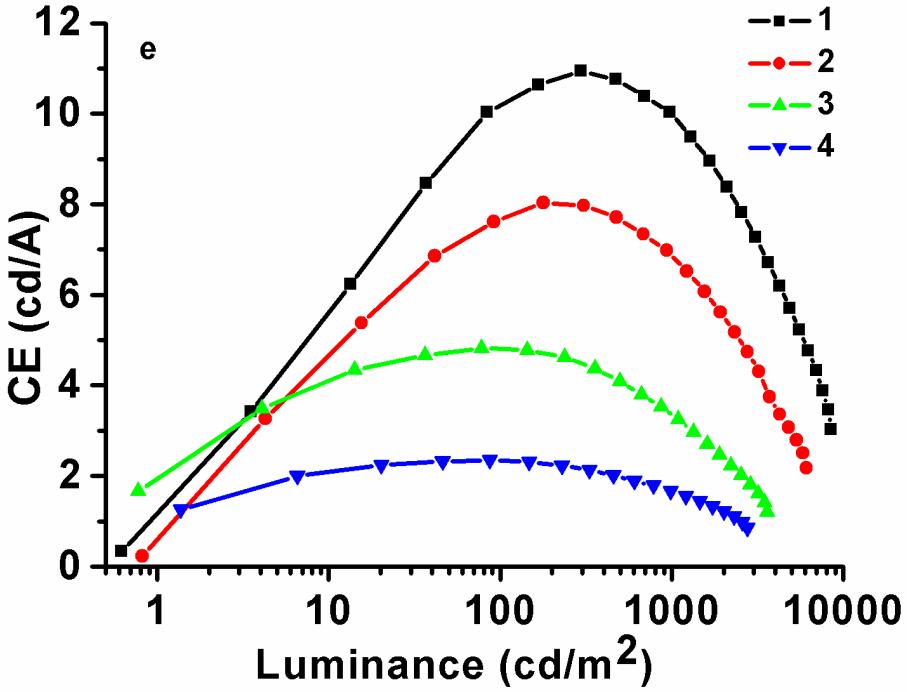
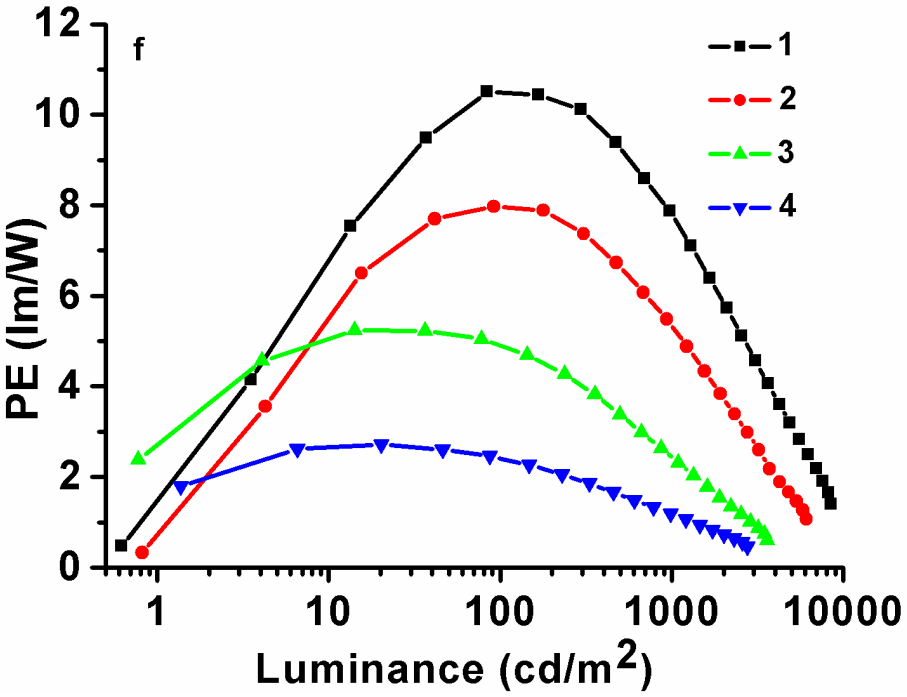
0.6
0.4
0.2
0.0
300
400
500
600
700
800
Wavelength(nm)


e
1
2
3
4
CE (cd/A)
Luminance (cd/m2)
0
2
4
6
8
10
12
1
10
100
1000
10000


f
1
2
3
4
PE (lm/W)
Luminance (cd/m2)
0
2
4
6
8
10
12
1
10
100
1000
10000

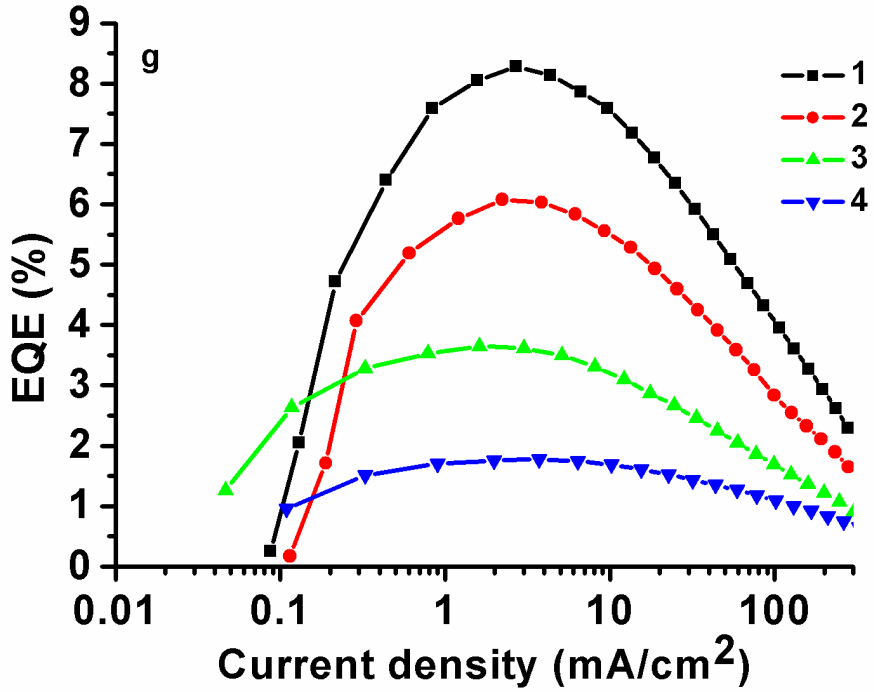


Fig. S7. (a-d) The EL spectra of the blue, green, red and white devices at different driving voltages, (e) current efficiency–luminance, (f) power efficiency–luminance and (g) EQE vs current density curves of the optimized devices based on R2 utilizing **CzPy-DPyFM** host.

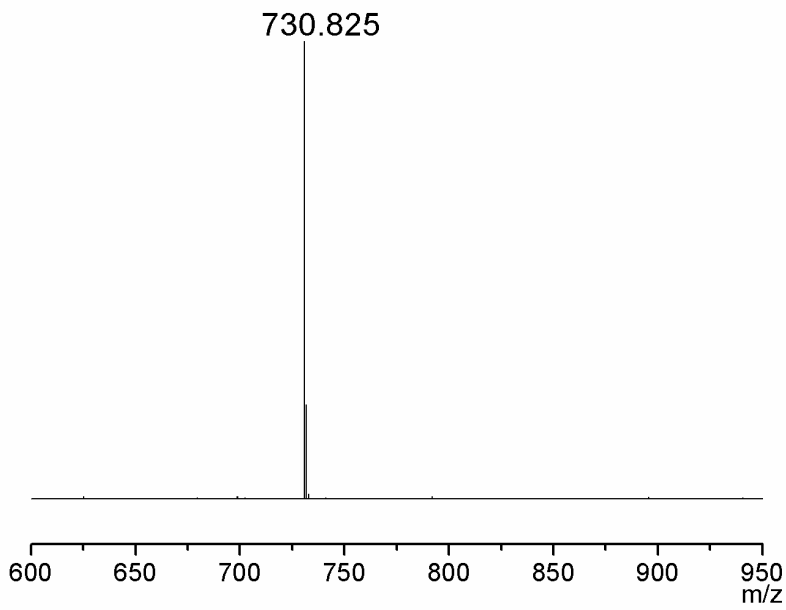


Fig. S8. The MALDI-TOF-MS spectrum of **T_3PyFM**

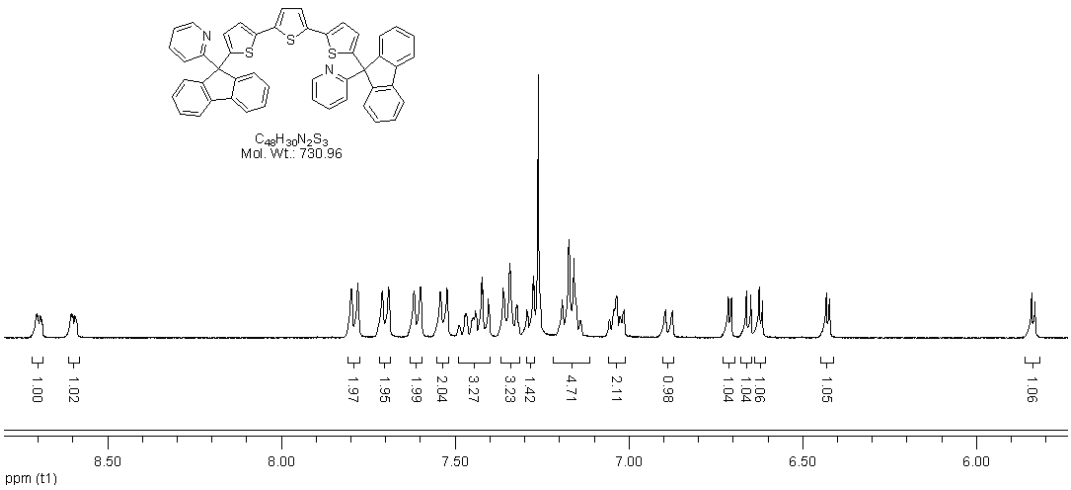


Fig. S9. ^{1}H NMR spectrum of **T_3PyFM** in $CDCl_3$

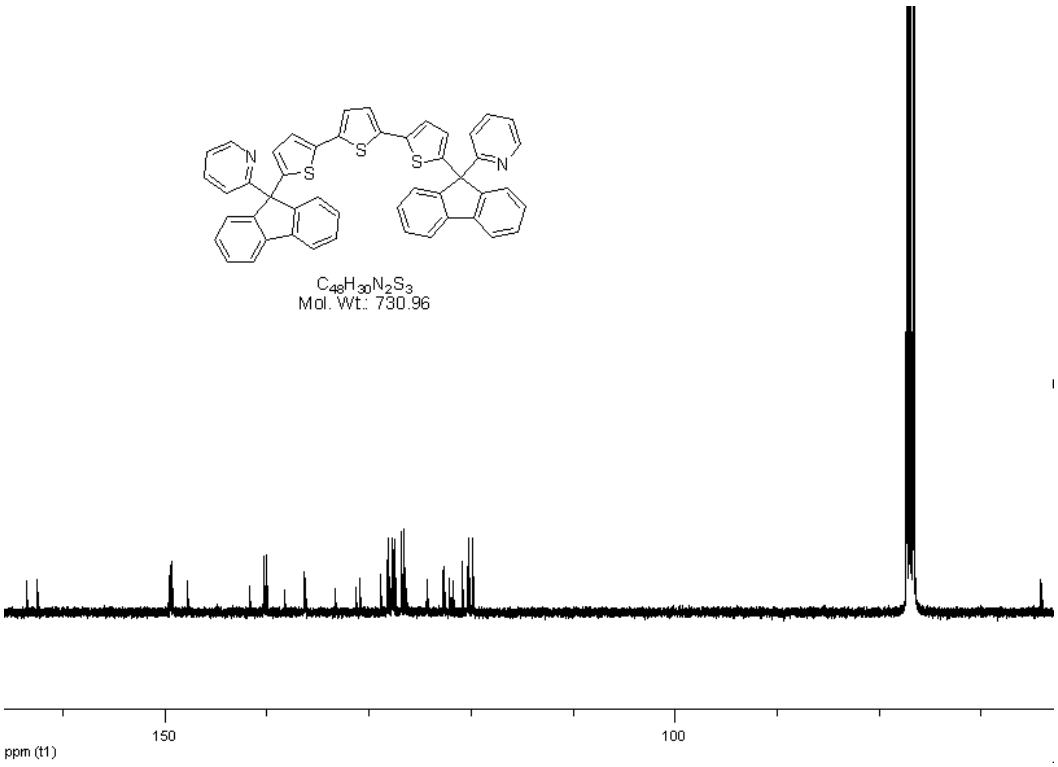


Fig. S10. ^{13}C NMR spectrum of **T_3PyFM** in $CDCl_3$

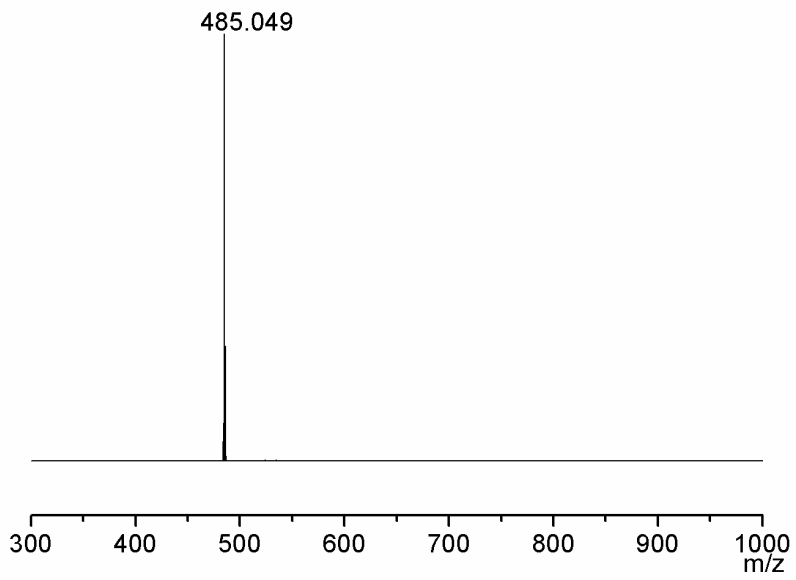


Fig. S11. The MALDI-TOF-MS spectrum of **CzPy-PyFM**

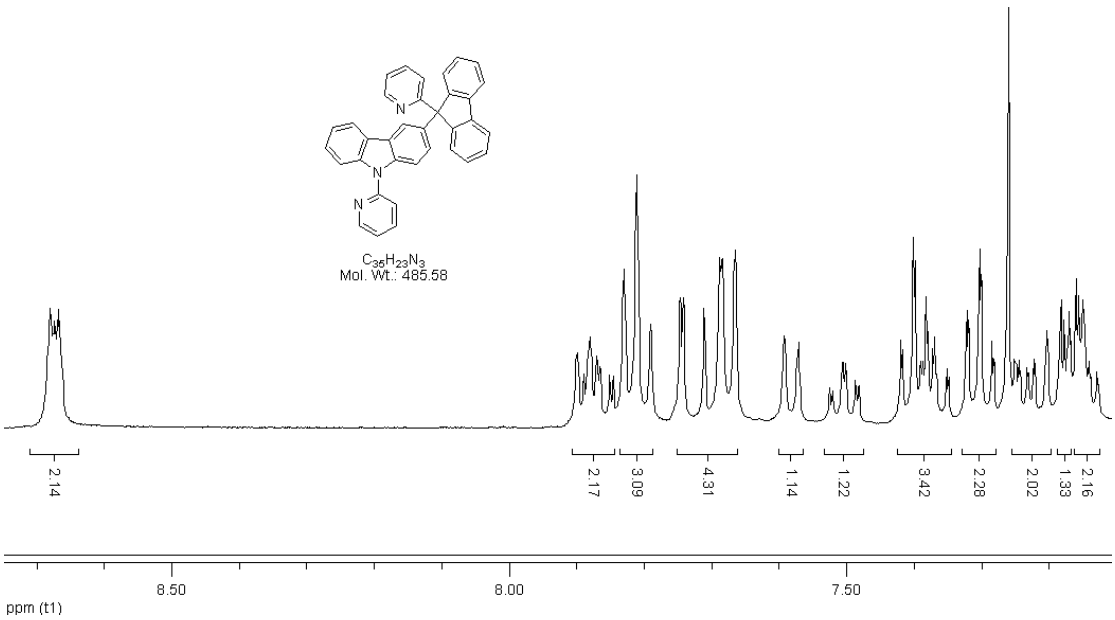


Fig. S12. ^{1}H NMR spectrum of **CzPy-PyFM** in $CDCl_3$

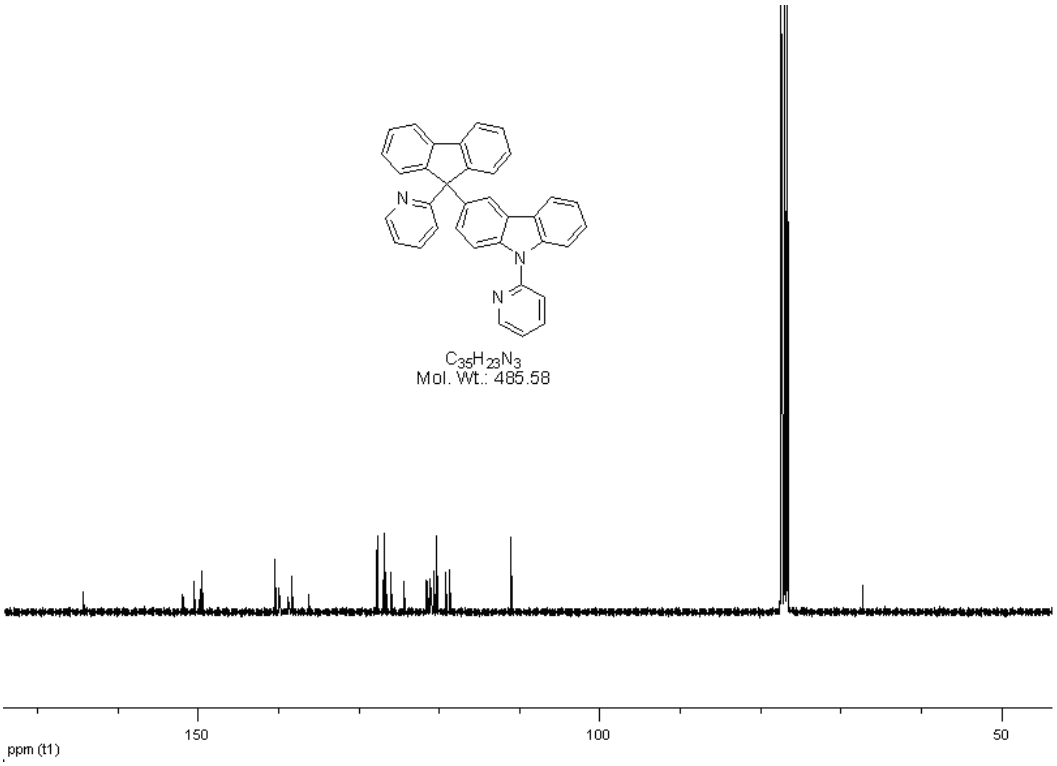


Fig. S13. ^{13}C NMR spectrum of **CzPy-PyFM** in $CDCl_3$

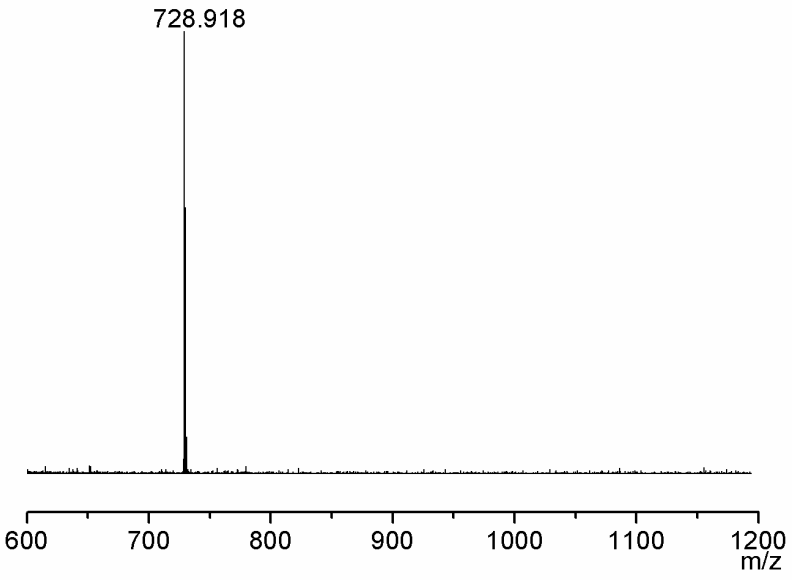


Fig. S14. The MALDI-TOF-MS spectrum of **CzPy-DPyFM**

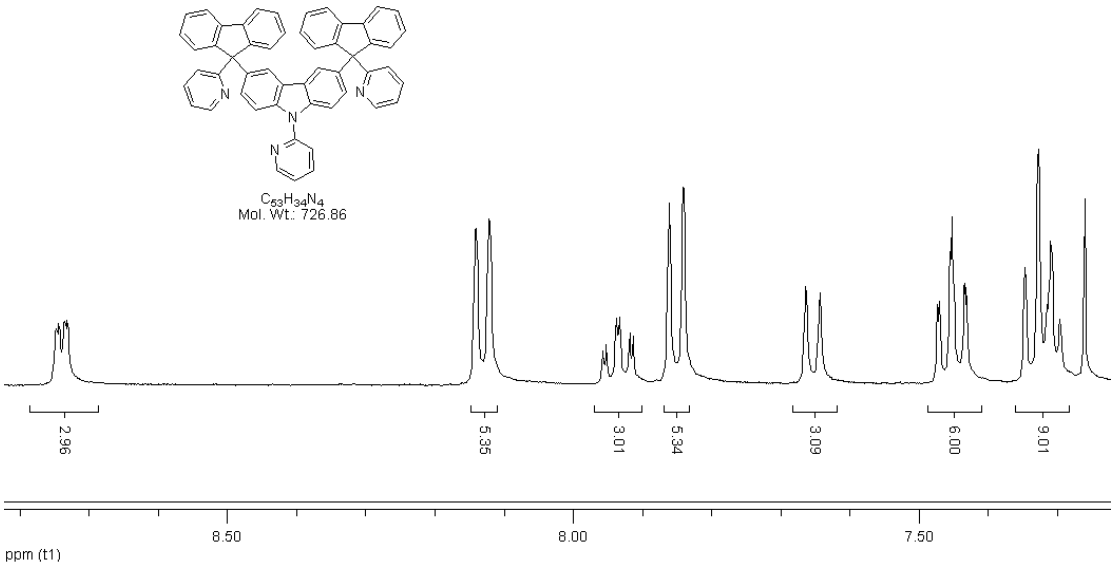


Fig. S15. ^{1}H NMR spectrum of **CzPy-DPyFM** in $CDCl_3$

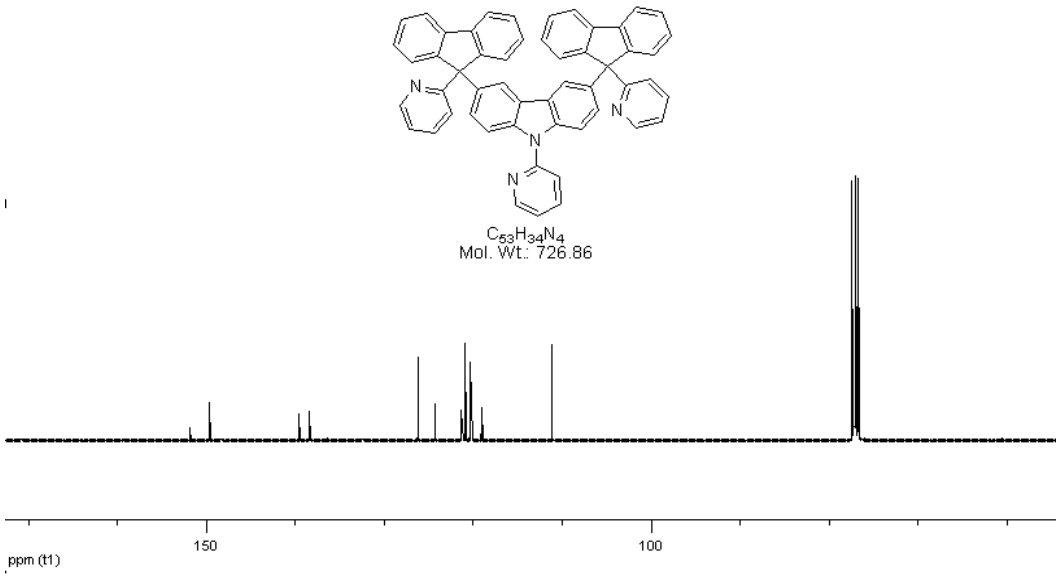


Fig. S16. ^{13}C NMR spectrum of **CzPy-DPyFM** in $CDCl_3$