Phase selectivity and tunable photophysical natures of rare earth metal–organic frameworks of Eu_xY_{1-x}-PTC (H_3PTC = 2, 4, 6-pyridine tricarboxylic acid; x = 0–1)

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Table S1: Crystallographic data and structure refinement details of Eu_xY_{1-x}-PTC

compound	$Eu_{0.82}Y_{0.18}$-PTC	$Eu_{0.745}Y_{0.255}$-PTC	$Eu_{0.66}Y_{0.34}$-PTC
empirical formula	$C_{16}H_{16}Eu_{1.64}N_2O_{18}Y_{0.36}$	$C_{16}H_{16}Eu_{1.49}N_2O_{18}Y_{0.51}$	$C_{16}H_{16}Eu_{1.32}N_2O_{18}Y_{0.68}$
CCDC deposit no.	1968497	1968494	1968493
F_w (g mol^{-1})	805.61	796.09	785.43
crystal system	monoclinic	monoclinic	monoclinic
space group	$P2_1/n$	$P2_1/n$	$P2_1/n$
crystal color	colorless	colorless	colorless
crystal size	0.3×0.2×0.1	0.3×0.2×0.1	0.3×0.2×0.1
temperature (K)	303(2)	306(2)	303(2)
Wavelength (Å)	0.71073	0.71073	0.71073
a (Å)	18.4125(10)	18.3931(12)	18.3854(4)
b (Å)	6.9080(3)	6.9087(5)	6.9070(2)
c (Å)	18.5353(10)	18.5133(12)	18.5103(5)
α (deg)	90	90	90
β (deg)	112.0386(18)	112.056(2)	112.0906(8)
γ (deg)	90	90	90
V (Å^3)	2185.31(19)	2180.4(3)	2178.03(10)
Z	4	4	4
D_c (g cm^{-3})	2.449	2.425	2.395
F(000)	1549.0	1535.0	1518.8
$\theta_{min,max}$(°)	3.18-27.49	3.18-27.49	3.18-27.48
GOF	1.178	1.104	1.158
R_1,[a] wR_2[b] [$I > 2\sigma(I)$]	0.0157, 0.0336	0.0160, 0.0361	0.0150, 0.0316

[a] $R_1 = \sum||F_o| - |F_c|/\sum|F_o|$. [b] $wR_2 = \{\sum[w(F_o^2 - F_c^2)^2]/\sum[w(F_o^2)^2]\}^{1/2}$

Continue Table S1

compound	$Eu_{0.55}Y_{0.45}$-PTC	$Eu_{0.49}Y_{0.51}$-PTC	$Eu_{0.395}Y_{0.605}$-PTC
empirical formula	$C_{16}H_{16}Eu_{1.10}N_2O_{18}Y_{0.90}$	$C_{16}H_{16}Eu_{0.98}N_2O_{18}Y_{1.02}$	$C_{16}H_{16}Eu_{0.79}N_2O_{18}Y_{1.21}$
CCDC deposit no.	1968487	1968473	1968463
F_w (g mol^{-1})	771.30	763.93	751.66
crystal system	monoclinic	monoclinic	monoclinic
space group	$P2_1/n$	$P2_1/n$	$P2_1/n$
crystal color	colorless	colorless	colorless
crystal size	0.3×0.2×0.1	0.3 × 0.2 × 0.1	0.3 × 0.2 × 0.1
temperature (K)	301(2)	273(2)	301(2)
Wavelength (Å)	0.71073	0.71073	0.71073
a (Å)	18.356(3)	18.3578(7)	18.3663(7)
b (Å)	6.8895(13)	6.9013(3)	6.8962(3)
c (Å)	18.502(3)	18.4646(8)	18.4474(7)
α (deg)	90	90	90
β (deg)	112.176(7)	112.1571(11)	112.1762(14)
γ (deg)	90	90	90
V (Å^3)	2166.8(7)	2166.58(16)	2163.67(15)
Z	4	4	4
D_c (g cm^{-3})	2.364	2.342	2.307
F(000)	1497.5	1486.0	1467.4
$\theta_{min,max}$(°)	3.18-27.55	1.98-27.56	3.18-27.51
GOF	1.130	1.047	1.151
R_1,[a] wR_2[b] [$I > 2\sigma(I)$]	0.0216, 0.0410	0.0208, 0.0431	0.0149,0.0326

[a] $R_1 = \sum||F_o| - |F_c|/\sum|F_o|$. [b] $wR_2 = \{\sum[w(F_o^2 - F_c^2)^2]/\sum[w(F_o^2)^2]\}^{1/2}$

Continue Table S1

compound	$Eu_{0.285}Y_{0.715}$-PTC	$Eu_{0.195}Y_{0.805}$-PTC	$Eu_{0.09}Y_{0.91}$-PTC
empirical formula	$C_{16}H_{16}Eu_{0.57}N_2O_{18}Y_{1.43}$	$C_{16}H_{16}Eu_{0.39}N_2O_{18}Y_{1.61}$	$C_{16}H_{16}Eu_{0.18}N_2O_{18}Y_{1.82}$
CCDC deposit no.	1968449	1968480	1968448
F_w (g mol^{-1})	737.88	726.72	713.35
crystal system	monoclinic	monoclinic	monoclinic
space group	$P2_1/n$	$P2_1/n$	$P2_1/n$
crystal color	colorless	colorless	colorless
crystal size	0.3×0.2×0.1	0.3 × 0.2 × 0.1	0.3 × 0.2 × 0.1
temperature (K)	301(2)	273(2)	301(2)
Wavelength (Å)	0.71073	0.71073	0.71073
a (Å)	18.329(4)	18.3456(16)	18.3352(9)
b (Å)	6.8971(18)	6.8867(6)	6.8838(4)
c (Å)	18.442(4)	18.3909(16)	18.3844(9)
α (deg)	90	90	90
β (deg)	112.200(9)	112.165(3)	112.22
γ (deg)	90	90	90
V (Å^3)	2158.6(8)	2151.8(3)	2148.16(19)
Z	4	4	4
D_c (g cm^{-3})	2.270	2.243	2.206
F(000)	1446.4	1429.0	1409.0
$\theta_{min,max}$(°)	3.18-27.49	1.99-27.55	3.19-27.50
GOF	1.088	1.083	1.074
R_1,[a] wR_2[b] [$I > 2\sigma(I)$]	0.0230, 0.0423	0.0231, 0.0494	0.0197,0.0433

[a] $R_1 = \sum||F_o| - |F_c|/\sum|F_o|$. [b] $wR_2 = \{\sum[w(F_o^2 - F_c^2)^2]/\sum[w(F_o^2)^2]\}^{1/2}$

Table S2: Selected bond length (Å) and bond angle (°) for Y-PTC and Eu-PTC

Y-PTC			
Bond length / Å			
Y1-N2	2.496(4)	Y1-O3	2.376(4)
Y1-O5	2.405(4)	Y1-O7	2.346(4)
Y1-O10	2.274(4)	Y1-O11	2.349(4)
Y1-O12	2.292(4)	Y1-O13	2.277(4)
Y2-N1	2.453(5)	Y2-O1	2.373(4)
Y2-O2	2.316(4)	Y2-O3	2.453(4)
Y2-O4	2.466(4)	Y2-O6	2.286(4)
Y2-O8	2.298(4)	Y2-O9	2.319(4)
Bond angles / °			
O3-Y1-N2	64.02(13)	O3-Y1-O5	127.90(12)
O5-Y1-N2	64.12(13)	O7-Y1-N2	126.93(15)
O7-Y1-O3	73.77(14)	O7-Y1-O5	147.82(14)
O7-Y1-O11	133.74(16)	O10-Y1-N2	73.86(15)
O10-Y1-O3	90.84(14)	O10-Y1-O5	79.69(14)
O10-Y1-O7	76.22(15)	O10-Y1-O11	143.87(16)
O10-Y1-O12	144.97(17)	O10-Y1-O13	79.89(17)
O11-Y1-N2	71.18(15)	O11-Y1-O3	82.01(13)
O11-Y1-O5	77.21(14)	O12-Y1-N2	139.09(16)
O12-Y1-O3	95.41(15)	O12-Y1-O5	121.08(16)
O12-Y1-O7	72.61(17)	O12-Y1-O11	71.15(17)
O13-Y1-N2	131.34(15)	O13-Y1-O3	156.98(15)
O13-Y1-O5	71.42(14)	O13-Y1-O7	83.53(15)
O13-Y1-O11	117.60(16)	O13-Y1-O12	81.10(17)
O3-Y2-N1	118.66(14)	N1-Y2-O4	71.63(14)
O1-Y2-N1	64.70(14)	O1-Y2-O3	119.59(13)
O1-Y2-O4	79.06(14)	O2-Y2-N1	65.85(15)
O2-Y2-O1	130.36(14)	O2-Y2-O3	81.19(14)
O2-Y2-O4	81.87(15)	O2-Y2-O9	88.11(16)
O3-Y2-O4	52.89(12)	O6-Y2-N1	140.64(16)
O6-Y2-O1	142.77(15)	O6-Y2-O2	82.78(15)
O6-Y2-O3	76.50(13)	O6-Y2-O4	128.70(13)
O6-Y2-O8	76.38(15)	O6-Y2-O9	79.01(15)
O8-Y2-N1	138.71(15)	O8-Y2-O1	74.02(14)
O8-Y2-O2	155.01(15)	O8-Y2-O3	80.67(15)
O8-Y2-O4	100.48(16)	O8-Y2-O9	101.48(16)
O9-Y2-N1	76.90(16)	O9-Y2-O1	85.03(15)
O9-Y2-O3	154.29(15)	O9-Y2-O4	148.39(15)
Eu-PTC			
Bond length / Å			
Eu1-O1	2.4102(17)	Eu1-O2#2	2.5179(16)

Eu1-O3	2.3945(17)	Eu1-O9#1	2.4988(17)
Eu1-O10#1	2.5802(18)	Eu1-O13	2.4403(19)
Eu1-O14	2.446(2)	Eu1-O15	2.418(2)
Eu1-N1	2.5473(19)	Eu2-O5	2.3713(17)
Eu2-O6#3	2.4014(17)	Eu2-O7	2.3472(17)
Eu2-O8#4	2.4125(17)	Eu2-O12#4	2.4040(17)
Eu2-O16	2.3818(19)	Eu2-O17	2.4416(19)
Eu2-N2#4	2.515(2)		
Bond angles / °			
O1-Eu1-O2#2	72.68(6)	O1-Eu1-O9#1	101.49(6)
O1-Eu1-O10#1	139.11(6)	O1-Eu1-O13	86.58(7)
O1-Eu1-O14	139.58(7)	O1-Eu1-O15	73.68(7)
O1-Eu1-N1	63.03(6)	O2#2-Eu1-O10#1	114.84(6)
O2#2-Eu1-N1	123.67(6)	O3-Eu1-O1	126.13(6)
O3-Eu1-O2#2	147.01(6)	O3-Eu1-O9#1	121.90(6)
O3-Eu1-O10#1	70.65(6)	O3-Eu1-O13	80.80(6)
O3-Eu1-O14	85.50(7)	O3-Eu1-O15	85.15(7)
O3-Eu1-N1	63.28(6)	O9#1-Eu1-O2#2	71.26(6)
O9#1-Eu1-O10#1	51.25(6)	O9#1-Eu1-N1	147.76(6)
O13-Eu1-O2#2	73.08(6)	O13-Eu1-O9#1	138.92(7)
O13-Eu1-O10#1	134.30(6)	O13-Eu1-O14	73.28(7)
O13-Eu1-N1	71.35(6)	O14-Eu1-O2#2	68.10(7)
O14-Eu1-O9#1	75.01(7)	O14-Eu1-O10#1	69.67(7)
O14-Eu1-N1	135.66(7)	O15-Eu1-O2#2	127.81(7)
O15-Eu1-O9#1	77.82(7)	O15-Eu1-O10#1	71.08(7)
O15-Eu1-O13	142.01(7)	O15-Eu1-O14	140.57(8)
O15-Eu1-N1	70.79(7)	N1-Eu1-O10#1	121.34(6)
O5-Eu2-O6#3	73.54(6)	O5-Eu2-O8#4	137.70(6)
O5-Eu2-O12#4	82.93(6)	O5-Eu2-O16	79.62(7)
O5-Eu2-O17	70.73(7)	O5-Eu2-N2#4	136.36(6)
O6#3-Eu2-O8#4	80.00(6)	O6#3-Eu2-O12#4	86.41(6)
O6#3-Eu2-O17	143.39(7)	O6#3-Eu2-N2#4	77.02(6)
O7-Eu2-O5	137.55(6)	O7-Eu2-O6#3	148.31(6)
O7-Eu2-O8#4	76.64(7)	O7-Eu2-O12#4	91.35(6)
O7-Eu2-O16	94.02(7)	O7-Eu2-O17	66.82(7)
O7-Eu2-N2#4	73.74(6)	O8#4-Eu2-O17	133.60(7)
O8#4-Eu2-N2#4	64.54(6)	O12#4-Eu2-O8#4	128.08(6)
O12#4-Eu2-O17	81.61(7)	O12#4-Eu2-N2#4	63.60(6)
O16-Eu2-O6#3	99.15(7)	O16-Eu2-O8#4	72.64(7)
O16-Eu2-O12#4	159.28(7)	O16-Eu2-O17	82.16(8)
O16-Eu2-N2#4	137.06(7)	O17-Eu2-N2#4	125.97(7)

Symmetry codes: #1 = 1/2-x, 1/2+y, 3/2-z; #2 = 1/2-x, -1/2+y, 3/2-z; #3 = 1-x, 2-y, 1-z; #4 = 1/2-x,1/2+y,1/2-z

Table S3: Crystallographic data and structure refinement details of Eu_xY_{1-x}-PTC (herein, the Eu and Y site occupation factors are determined by the ICP)

compound	$Eu_{0.835}Y_{0.165}$-PTC	$Eu_{0.745}Y_{0.255}$-PTC	$Eu_{0.645}Y_{0.355}$-PTC
empirical formula	$C_{16}H_{16}Eu_{1.67}N_2O_{18}Y_{0.33}$	$C_{16}H_{16}Eu_{1.49}N_2O_{18}Y_{0.51}$	$C_{16}H_{16}Eu_{1.29}N_2O_{18}Y_{0.71}$
F_w (g mol^{-1})	807.42	796.07	783.46
crystal system	monoclinic	monoclinic	monoclinic
space group	$P2_1/n$	$P2_1/n$	$P2_1/n$
crystal color	colorless	colorless	colorless
crystal size	0.3×0.2×0.1	0.3×0.2×0.1	0.3×0.2×0.1
temperature (K)	303(2)	306(2)	303(2)
Wavelength (Å)	0.71073	0.71073	0.71073
a (Å)	18.4125(10)	18.3931(12)	18.3854(4)
b (Å)	6.9080(3)	6.9087(5)	6.9070(2)
c (Å)	18.5353(10)	18.5133(12)	18.5103(5)
α (deg)	90	90	90
β (deg)	112.0386(18)	112.056(2)	112.0906(8)
γ (deg)	90	90	90
V (Å^3)	2185.31(19)	2180.4(3)	2178.03(10)
Z	4	4	4
D_c (g cm^{-3})	2.454	2.425	2.389
F(000)	1552.0	1535.0	1516.0
$\theta_{min,max}$(°)	3.18-27.49	3.18-27.49	3.18-27.48
GOF	1.080	1.053	1.088
R_1,[a] wR_2[b] [$I > 2\sigma(I)$]	0.0171, 0.0404	0.0202, 0.0495	0.0229, 0.0614

[a] $R_1 = \sum||F_o| - |F_c|/\sum|F_o|$. [b] $wR_2 = \{\sum[w(F_o^2 - F_c^2)^2]/\sum[w(F_o^2)^2]\}^{1/2}$

Continue Table S3

compound	$Eu_{0.56}Y_{0.44}$-PTC	$Eu_{0.425}Y_{0.575}$-PTC	$Eu_{0.34}Y_{0.66}$-PTC
empirical formula	$C_{16}H_{16}Eu_{1.12}N_2O_{18}Y_{0.88}$	$C_{16}H_{16}Eu_{0.85}N_2O_{18}Y_{1.15}$	$C_{16}H_{16}Eu_{0.68}N_2O_{18}Y_{1.32}$
F_w (g mol^{-1})	772.74	755.72	745.00
crystal system	monoclinic	monoclinic	monoclinic
space group	$P2_1/n$	$P2_1/n$	$P2_1/n$
crystal color	colorless	colorless	colorless
crystal size	0.3×0.2×0.1	0.3 × 0.2 × 0.1	0.3 × 0.2 × 0.1
temperature (K)	301(2)	273(2)	301(2)
Wavelength (Å)	0.71073	0.71073	0.71073
a (Å)	18.356(3)	18.3578(7)	18.3663(7)
b (Å)	6.8895(13)	6.9013(3)	6.8962(3)
c (Å)	18.502(3)	18.4646(8)	18.4474(7)
α (deg)	90	90	90
β (deg)	112.176(7)	112.1571(11)	112.1762(14)
γ (deg)	90	90	90
V (Å^3)	2166.8(7)	2166.58(16)	2163.67(15)
Z	4	4	4
D_c (g cm^{-3})	2.369	2.317	2.287
F(000)	1500.0	1474.0	1457.0
$\theta_{min,max}$(°)	3.18-27.55	3.18-27.51	3.18-27.49
GOF	1.092	1.135	1.107
R_1,[a] wR_2[b] [$I > 2\sigma(I)$]	0.0309, 0.0757	0.0331, 0.0897	0.0283, 0.0778

[a] $R_1 = \sum||F_o| - |F_c|/\sum|F_o|$. [b] $wR_2 = \{\sum[w(F_o^2 - F_c^2)^2]/\sum[w(F_o^2)^2]\}^{1/2}$

Continue Table S3

compound	$Eu_{0.30}Y_{0.70}$-PTC	$Eu_{0.21}Y_{0.79}$-PTC	$Eu_{0.08}Y_{0.92}$-PTC
empirical formula	$C_{16}H_{16}Eu_{0.60}N_2O_{18}Y_{1.40}$	$C_{16}H_{16}Eu_{0.42}N_2O_{18}Y_{1.58}$	$C_{16}H_{16}Eu_{0.16}N_2O_{18}Y_{1.84}$
F_w (g mol^{-1})	739.96	728.61	712.22
crystal system	monoclinic	monoclinic	monoclinic
space group	$P2_1/n$	$P2_1/n$	$P2_1/n$
crystal color	colorless	colorless	colorless
crystal size	0.3×0.2×0.1	0.3 × 0.2 × 0.1	0.3 × 0.2 × 0.1
temperature (K)	301(2)	273(2)	301(2)
Wavelength (Å)	0.71073	0.71073	0.71073
a (Å)	18.329(4)	18.3456(16)	18.3352(9)
b (Å)	6.8971(18)	6.8867(6)	6.8838(4)
c (Å)	18.442(4)	18.3909(16)	18.3844(9)
α (deg)	90	90	90
β (deg)	112.200(9)	112.165(3)	112.22
γ (deg)	90	90	90
V (Å^3)	2158.6(8)	2151.8(3)	2148.16(19)
Z	4	4	4
D_c (g cm^{-3})	2.277	2.249	2.202
F(000)	1450.0	1432.0	1407.0
$\theta_{min,max}$(°)	3.18-27.49	1.99-27.55	3.19-27.50
GOF	1.052	1.073	1.087
R_1,[a] wR_2[b] [$I > 2\sigma(I)$]	0.0338, 0.0848	0.0313, 0.0827	0.0246,0.0611

[a] $R_1 = \sum||F_o| - |F_c|/\sum|F_o|$. [b] $wR_2 = \{\sum[w(F_o^2 - F_c^2)^2]/\sum[w(F_o^2)^2]\}^{1/2}$

Continue Table S3

compound	$Eu_{0.06}Y_{0.94}$-PTC	$Eu_{0.013}Y_{0.987}$-PTC
empirical formula	$C_{16}H_{16}Eu_{0.12}N_2O_{18}Y_{1.88}$	$C_{16}H_{16}Eu_{0.026}N_2O_{18}Y_{1.974}$
F_w (g mol^{-1})	709.69	704.02
crystal system	monoclinic	monoclinic
space group	$P2_1/n$	$P2_1/n$
crystal color	colorless	colorless
crystal size	0.3 × 0.2 × 0.1	0.3 × 0.2 × 0.1
temperature (K)	273(2)	296(2)
Wavelength (Å)	0.71073	0.71073
a (Å)	18.3079(4)	18.3115(5)
b (Å)	6.8784(2)	6.8759(1)
c (Å)	18.3684(4)	18.3669(4)
α (deg)	90	90
β (deg)	112.1963(8)	112.2217(9)
γ (deg)	90	90
V (Å^3)	2166.58(16)	2140.82(8)
Z	4	4
D_c (g cm^{-3})	2.201	2.184
F(000)	1404.0	1395.0
$\theta_{min,max}$(°)	3.19-27.50	3.19-27.49
GOF	1.051	1.078
R_1,[a] wR_2[b] [$I > 2\sigma(I)$]	0.0251, 0.0563	0.0284, 0.0581

[a] $R_1 = \sum||F_o| - |F_c|/\sum|F_o|$. [b] $wR_2 = \{\sum[w(F_o^2 - F_c^2)^2]/\sum[w(F_o^2)^2]\}^{1/2}$

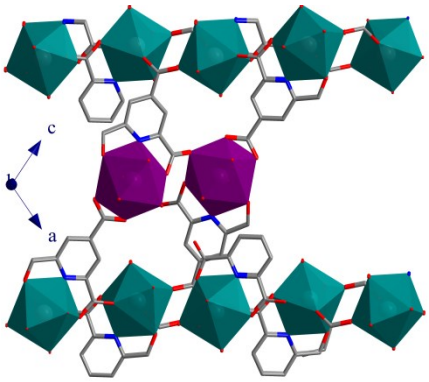


Figure S1: The connection of Eu1 (purple) and Eu2 (green) in Eu-PTC.

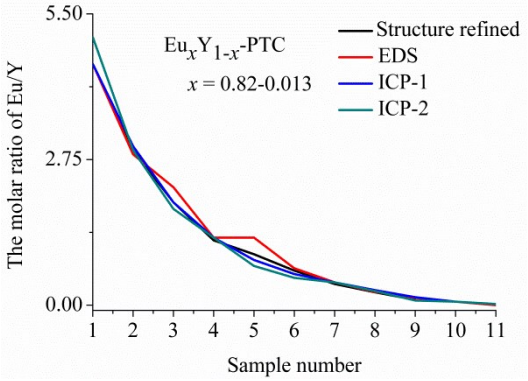


Figure S2: Molar ratio of Eu:Y = x: (1─x) in Eu$_x$Y$_{1-x}$-PTC.(Samples 1─11 represent x = 0.82─0.013)

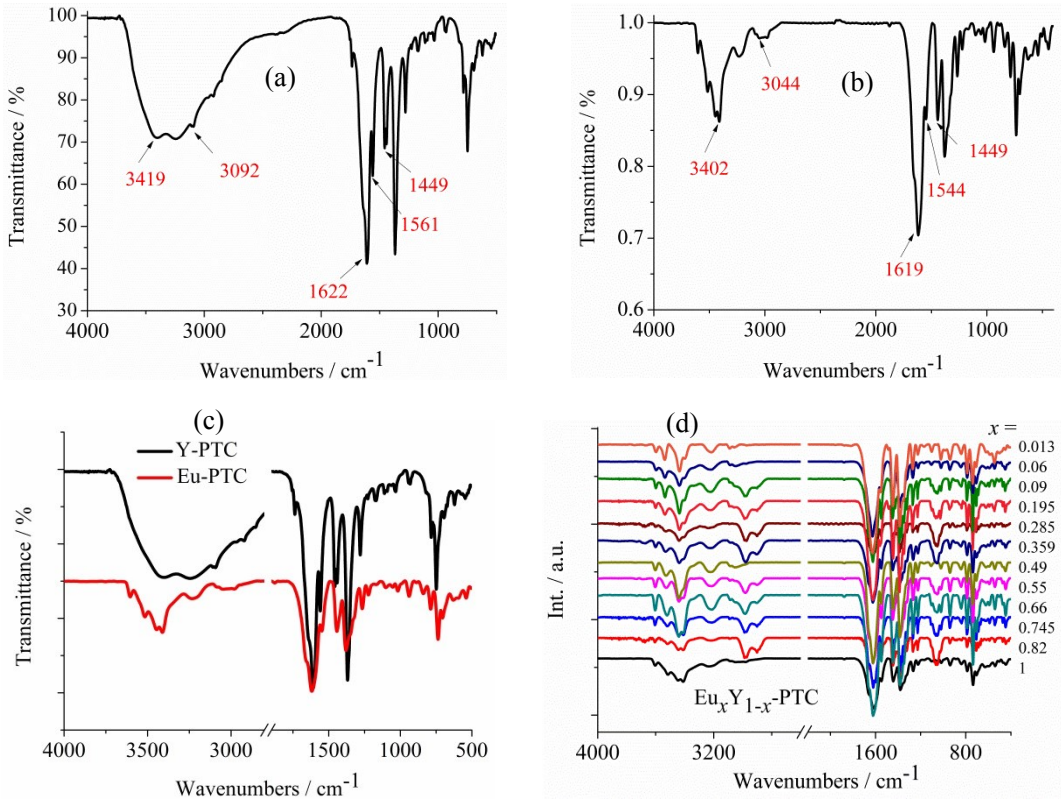


Figure S3: IR spectra of (a) Y-PTC (b) Eu-PTC (c) Y-PTC and Eu-PTC (d) Eu_xY_{1-x}-PTC (x = 0.013–1).

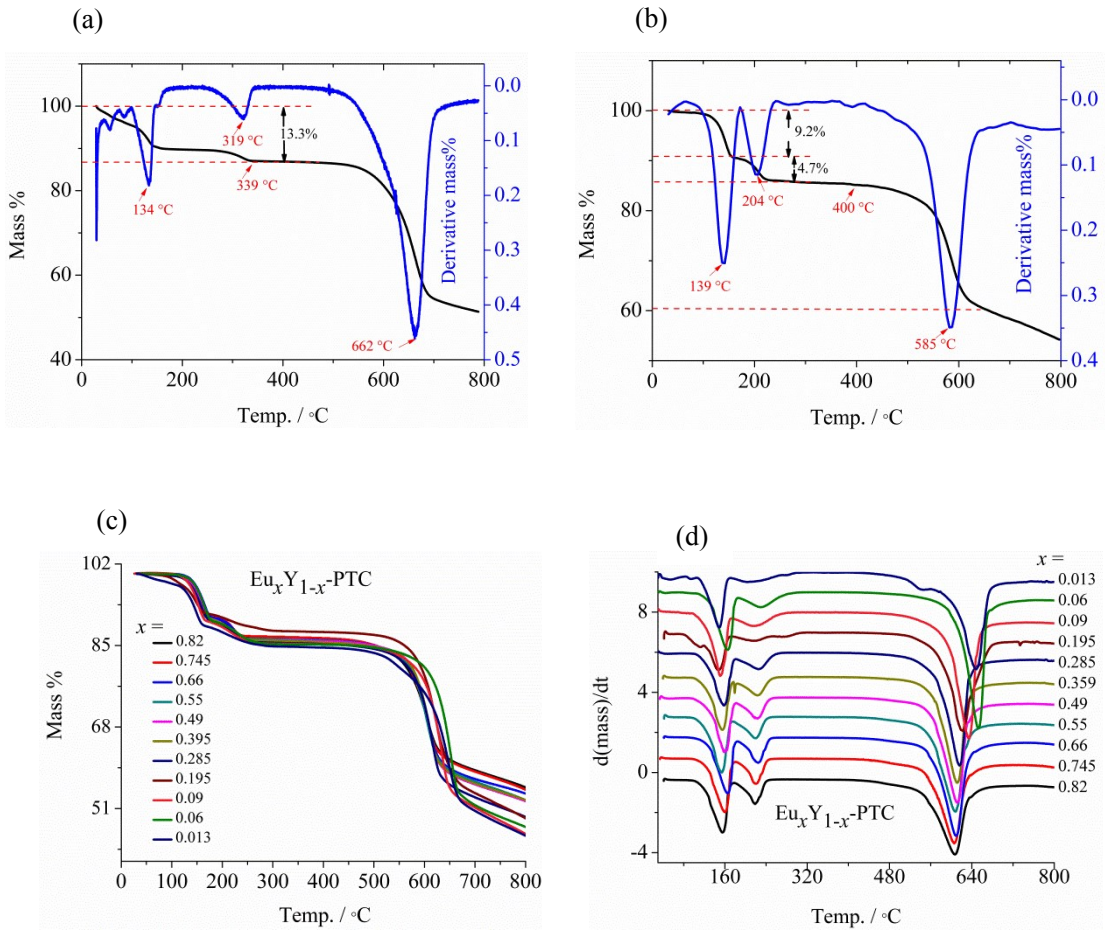


Figure S4: TG and DTA curves of (a)Y-PTC (b)Eu-PTC (c, d) Eu_xY_{1-x}-PTC (x = 0.013─0.82).

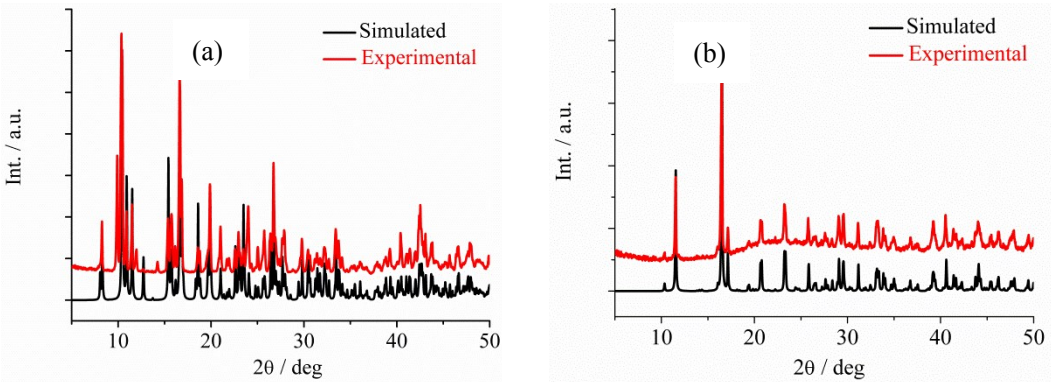


Figure S5: The powder X-ray diffraction patterns for (a) Y-PTC (b) Eu-PTC. (a)

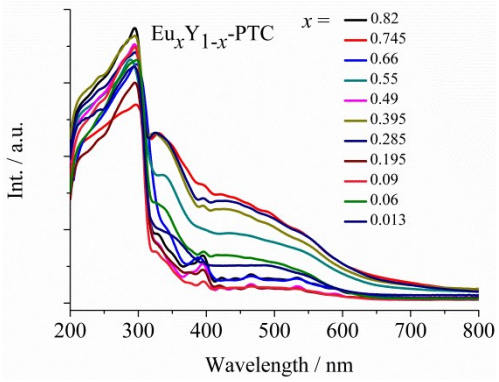


Figure S6: Solid-state UV-vis diffuse reflectance spectra of Eu$_x$Y$_{1-x}$-PTC (x = 0.013─0.82)**.**

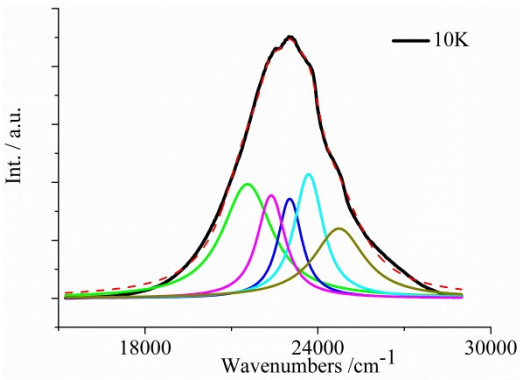


Figure S7: The fine structure of solid-state emission spectra for Y-PTC at 10K excited under UV light at 326 nm.

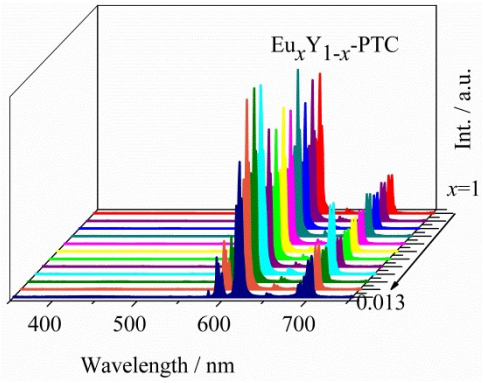


Figure S8: Eu$_x$Y$_{1-x}$-PTC (x = 0.013–1) under optimal excitation light with λ = 301 nm at room temperature.

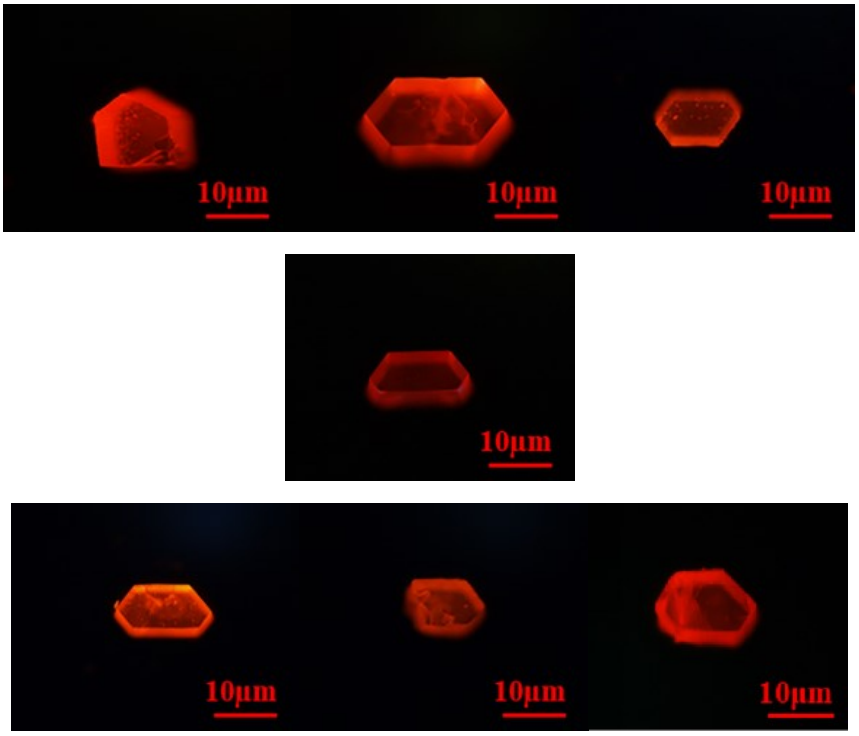


Figure S9: Images of crystals under UV light (300─380 nm) for Eu$_x$Y$_{1-x}$-PTC (x = 0.395─1)**.**

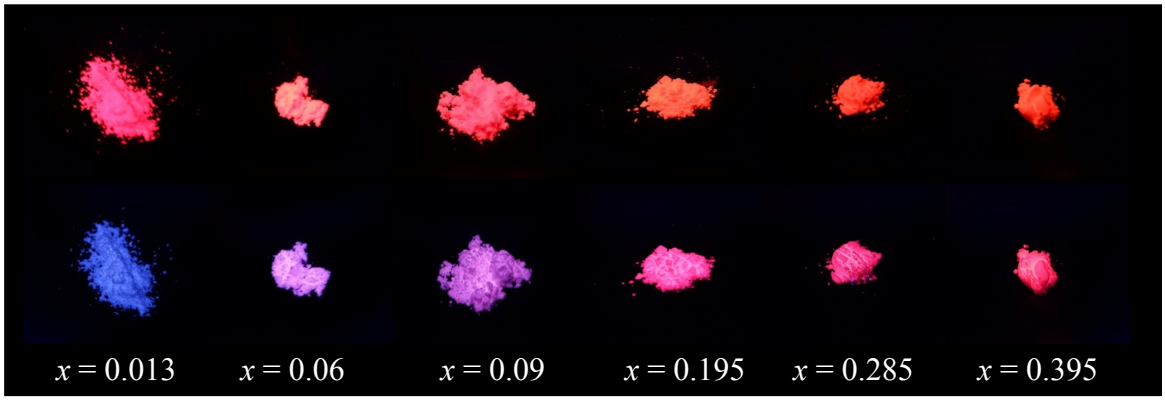
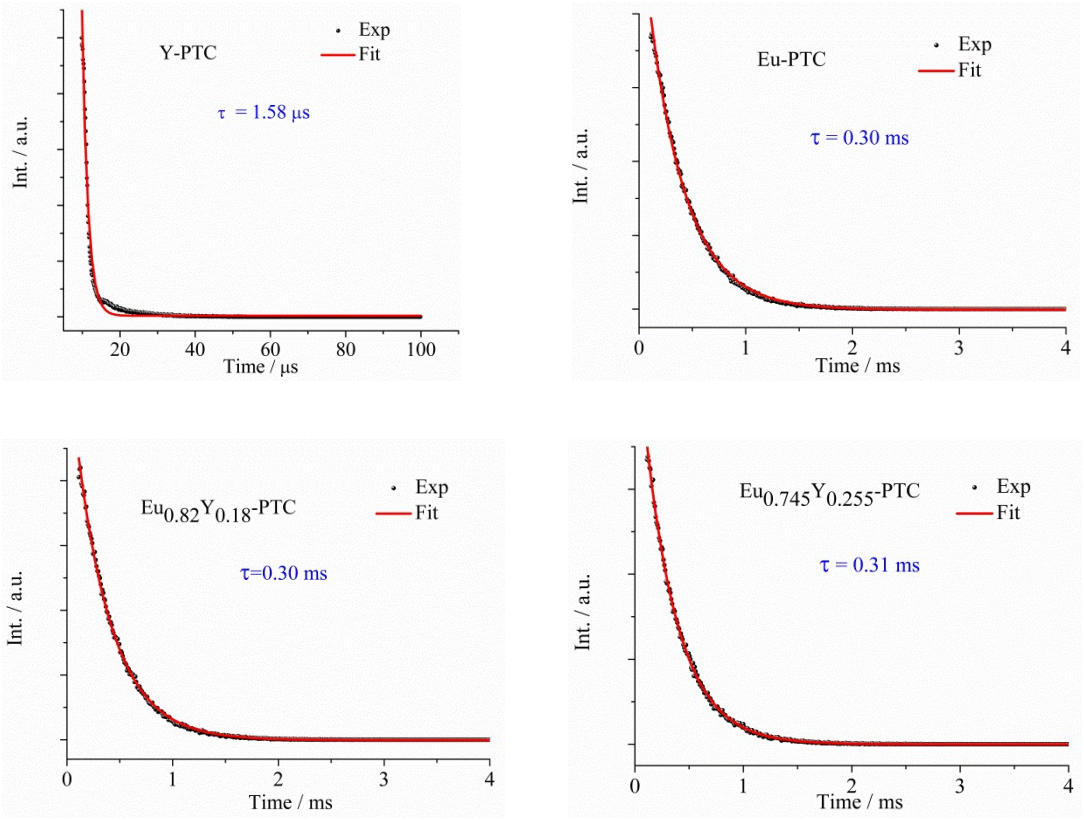
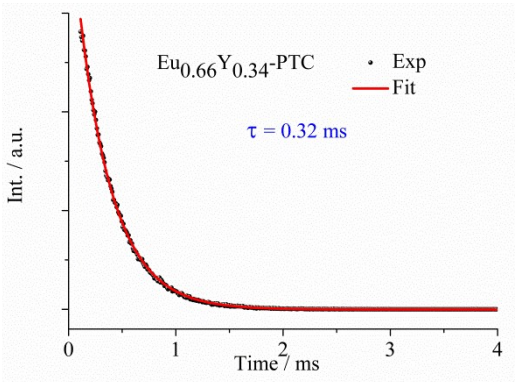
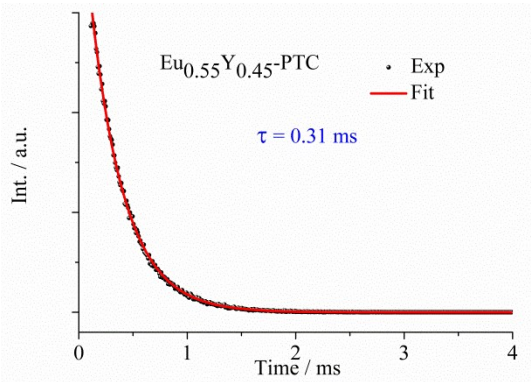
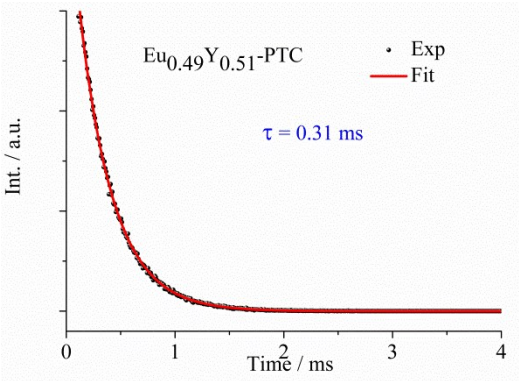


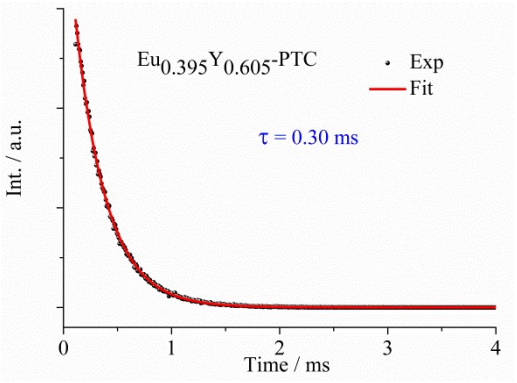
Figure S10: Photographs of Eu_xY_{1-x}-PTC under UV light (upper row, λ_{ex} = 254 nm and lower row, λ_{ex} = 365 nm) showing different colors owing to the emission spectra being dependent on excited wavelength.

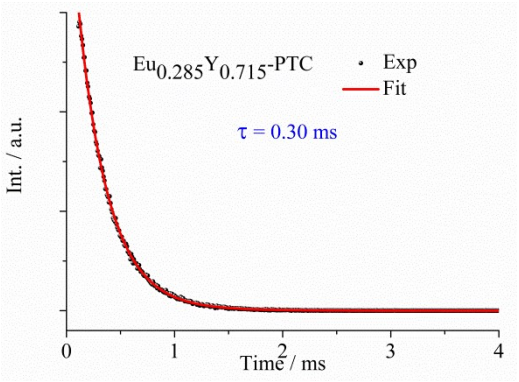


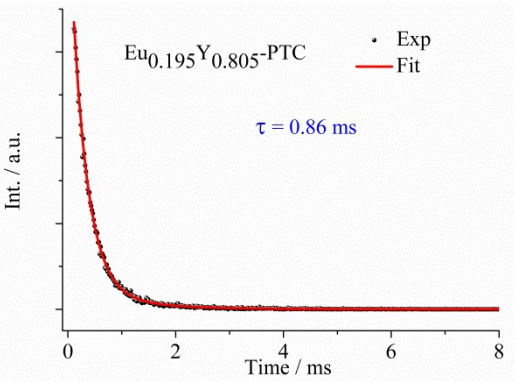

Eu0.66Y0.34-PTC
Exp
Fit
τ = 0.32 ms
Int. / a.u.
Time / ms
0
1
2
3
4

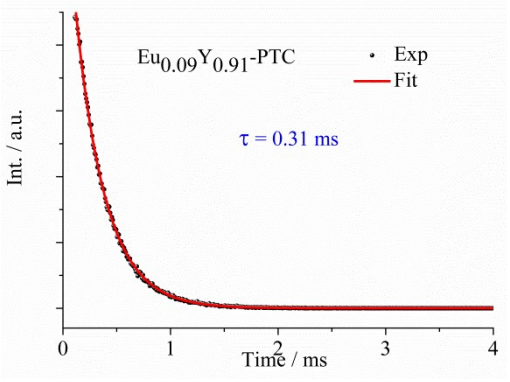

Eu0.55Y0.45-PTC
Exp
Fit
τ = 0.31 ms
Int. / a.u.
Time / ms
0
1
2
3
4

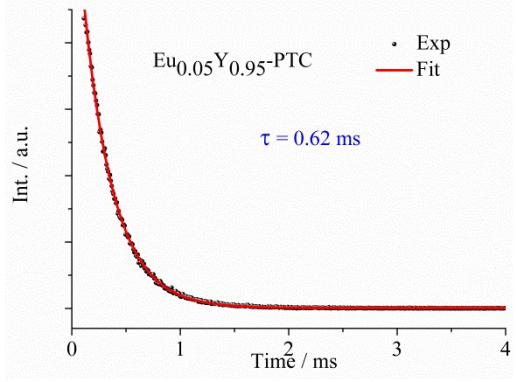

Eu0.49Y0.51-PTC
Exp
Fit
τ = 0.31 ms
Int. / a.u.
Time / ms
0
1
2
3
4


Eu0.395Y0.605-PTC
Exp
Fit
τ = 0.30 ms
Int. / a.u.
Time / ms
0
1
2
3
4


Eu0.285Y0.715-PTC
Exp
Fit
τ = 0.30 ms
Int. / a.u.
Time / ms
0
1
2
3
4


Eu0.195Y0.805-PTC
Exp
Fit
τ = 0.86 ms
Int. / a.u.
Time / ms
0
2
4
6
8


Eu0.09Y0.91-PTC
Exp
Fit
τ = 0.31 ms
Int. / a.u.
Time / ms
0
1
2
3
4


Eu0.05Y0.95-PTC
Exp
Fit
τ = 0.62 ms
Int. / a.u.
Time / ms
0
1
2
3
4

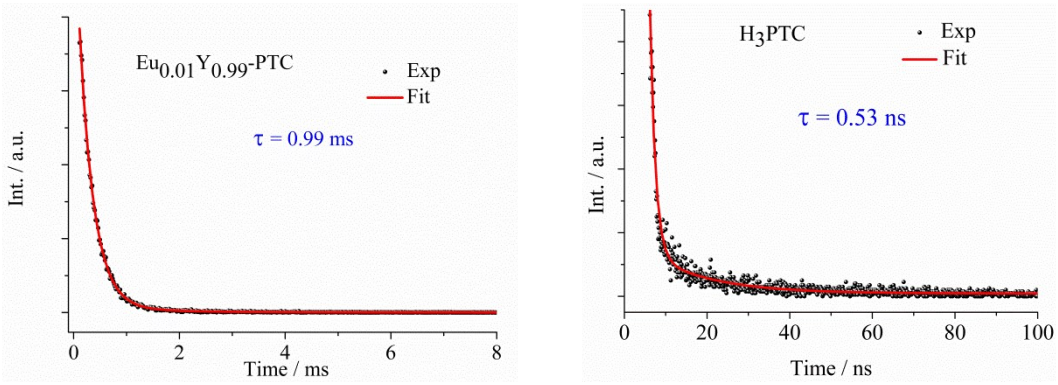


Figure S11: Emission decay of H_3PTC and all MOFs obtained at room temperature, where the red lines and the black squares represent the fitting curves and the experimental data, respectively.

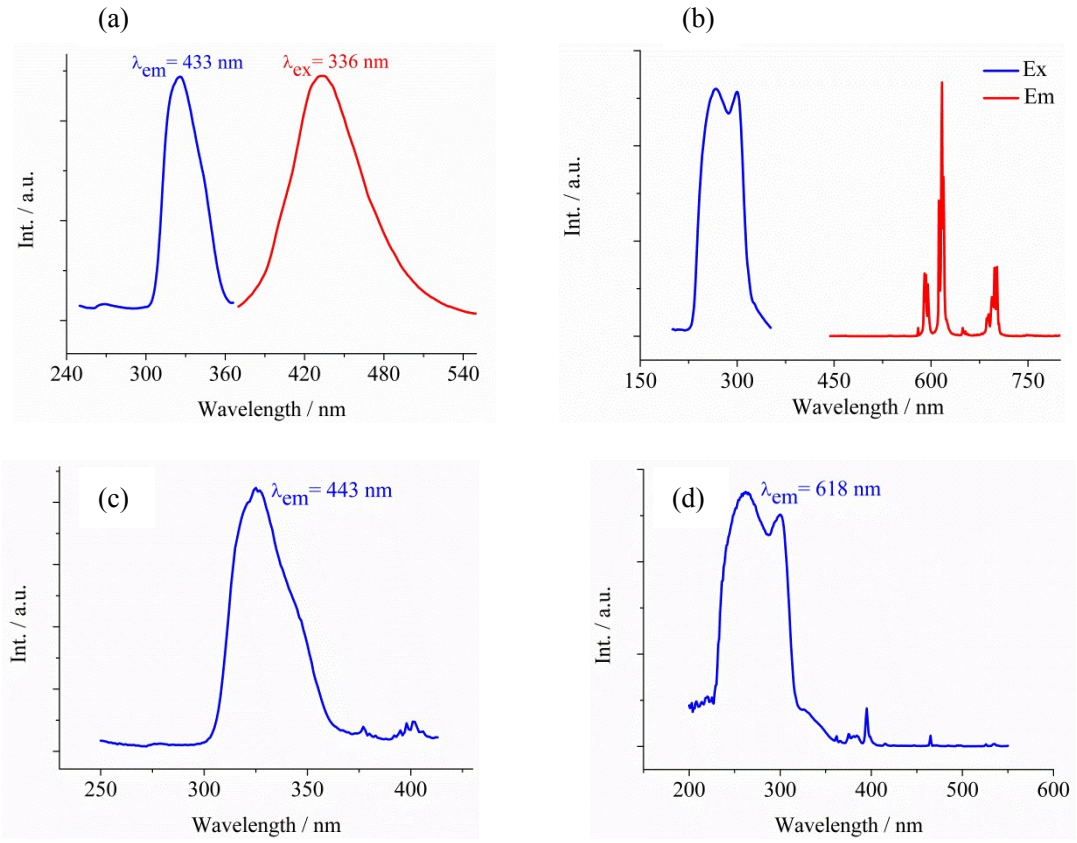


Figure S12: Excitation and emission spectra of (a) Y-PTC (b) Eu-PTC at ambient condition, excitation spectrum of $Eu_{0.06}Y_{0.94}$-PTC (c) examined at 443 nm (d) examined at 618 nm.