Electronic Supplementary Information

Tunable White-Light Emission PMMA-Supported Film Materials Containing Lanthanide Coordination Polymers: Preparation, Characterization, and Properties

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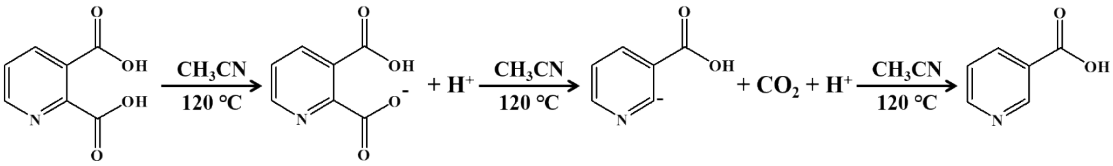

Scheme S1 The decarboxylation mechanism of H_2pydc

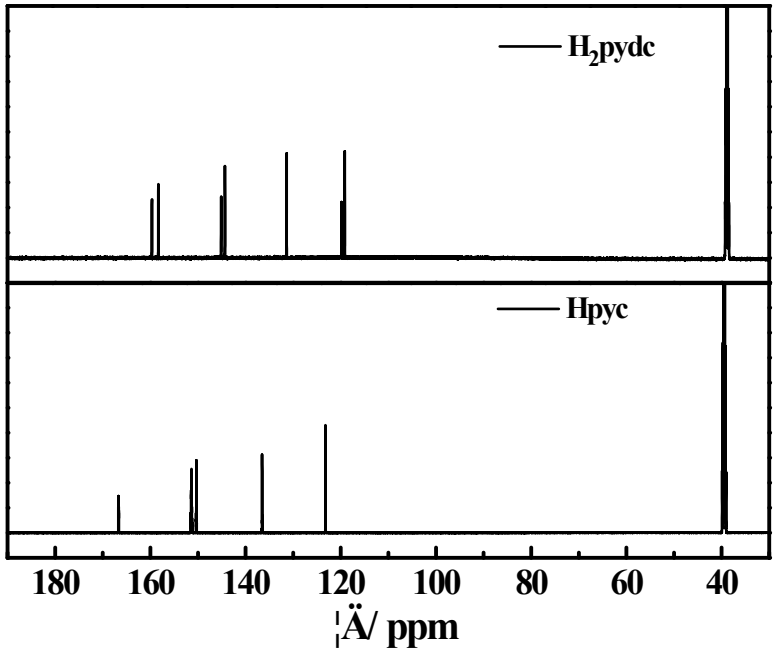

Figure S1 ^{13}C NMR spectra of ligand H_2pydc and Hpyc ligands.

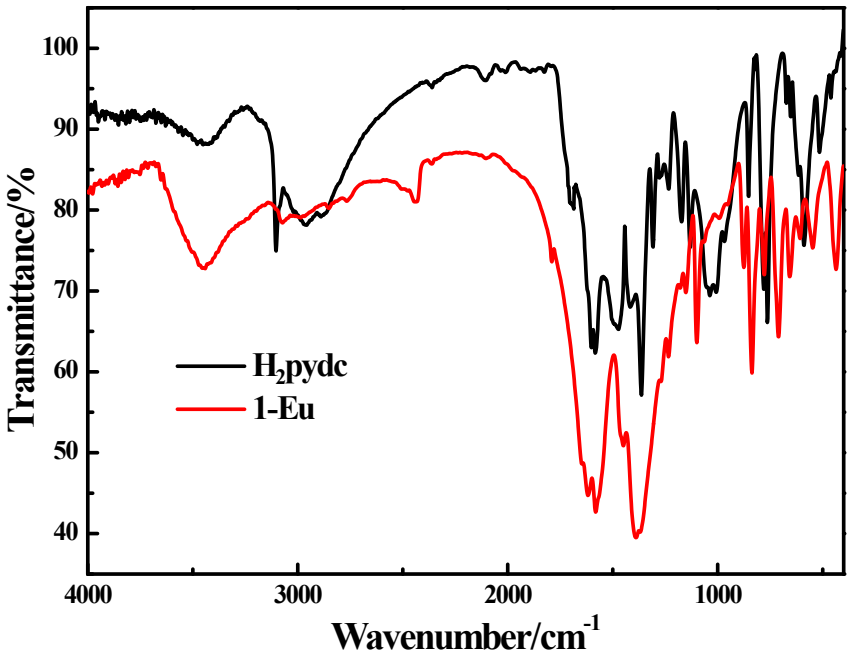

Figure S2 Infrared spectra of ligand H_2pydc and coordination polymer **1-Eu**.

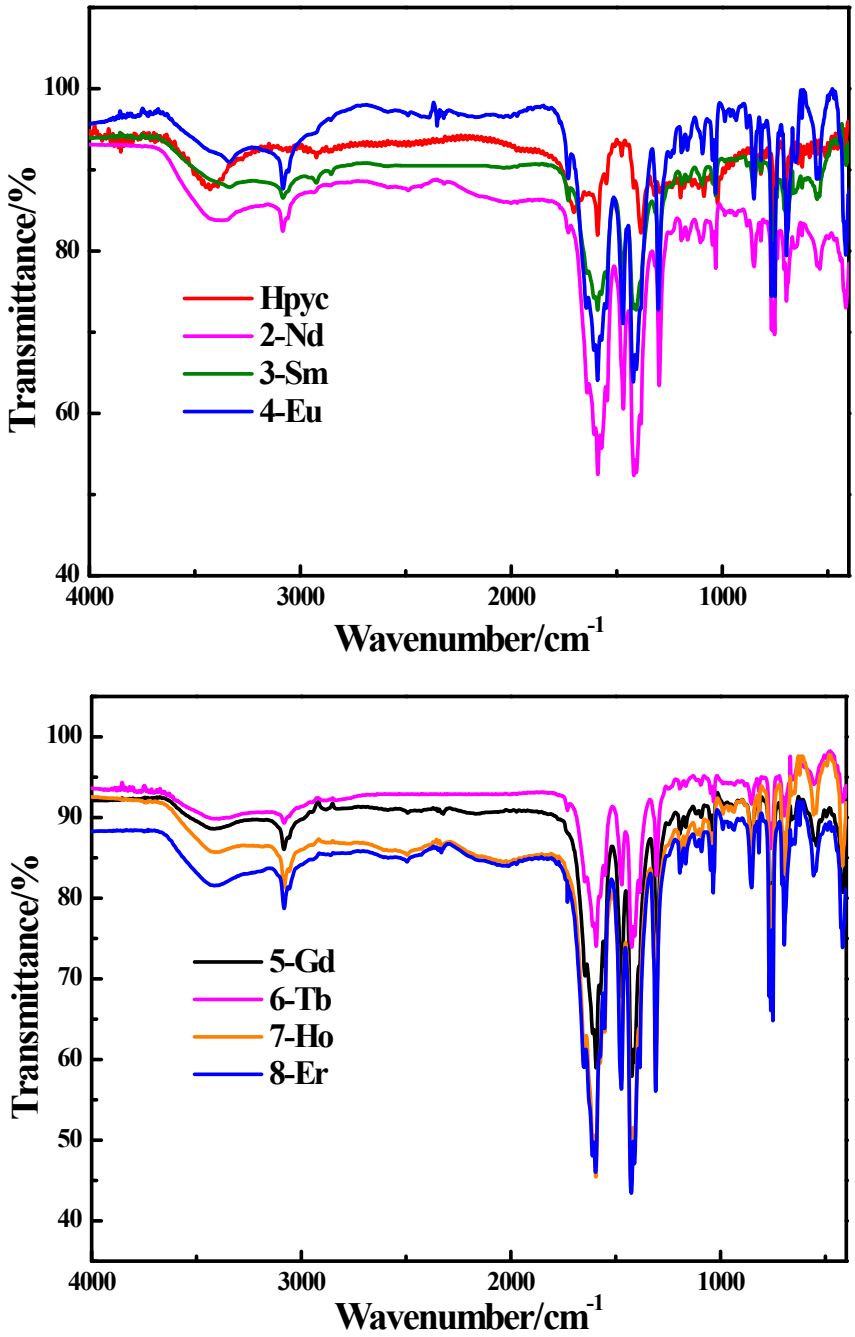

Figure S3 Infrared spectra of ligand Hpyc and coordination polymers **2-Nd** ~ **8-Er**.

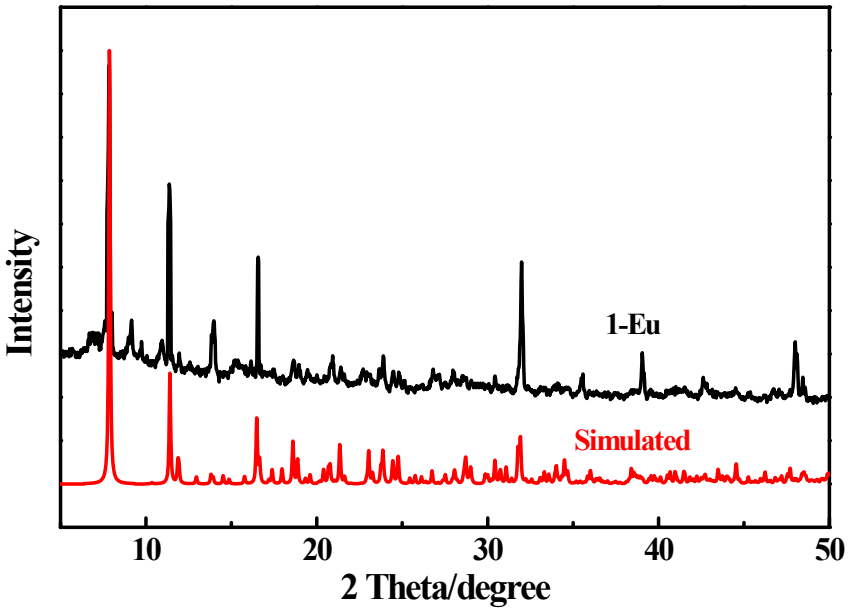

Figure S4 The experimental and simulated PXRD patterns of **1-Eu**.

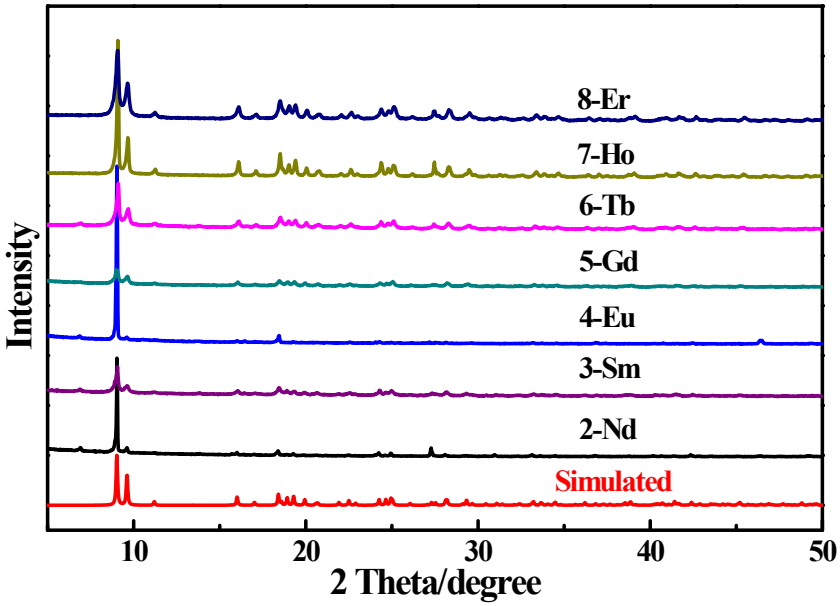

Figure S5 The experimental and simulated PXRD patterns of **2-Nd** ~ **8-Er**.

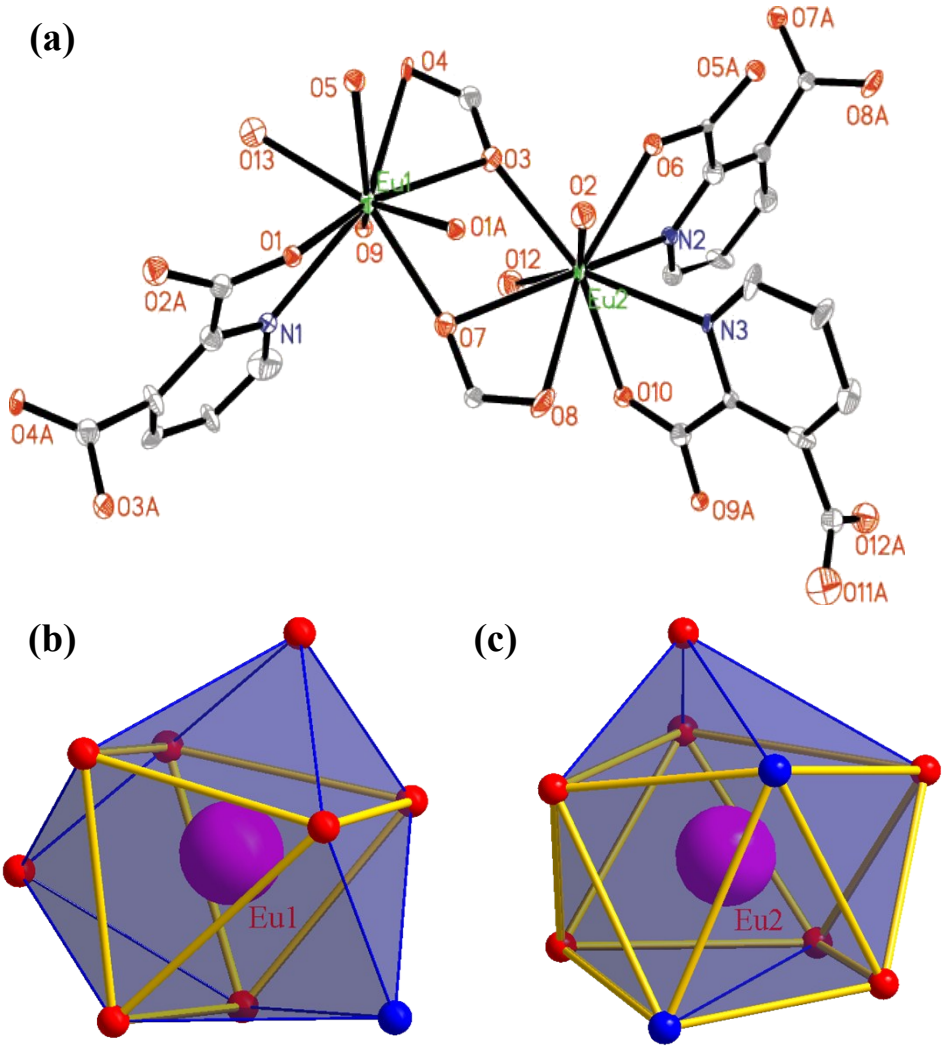

Figure S6 (a) The structural unit of **1-Eu** with a labeling scheme and 50% thermal ellipsoids (free water molecules and hydrogen atoms are omitted for clarity). (b) Polyhedral representation of the coordination sphere of the Eu1 centre, displaying a distorted tricapped trigonal prismatic arrangement in coordination polymer **1-Eu**. (c) Polyhedral representation of the coordination sphere of the Eu2 centre, displaying a distorted twist single-capped quadrangular arrangement in coordination polymer **1-Eu**.

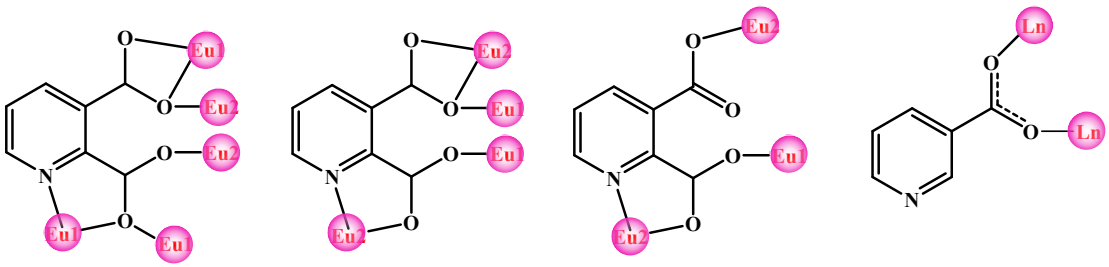

Figure S7 The different coordination modes of coordinated $pydc^{2-}$ and pyc^{-} ligands in coordination polymers **1-Eu** ~ **8-Er**.

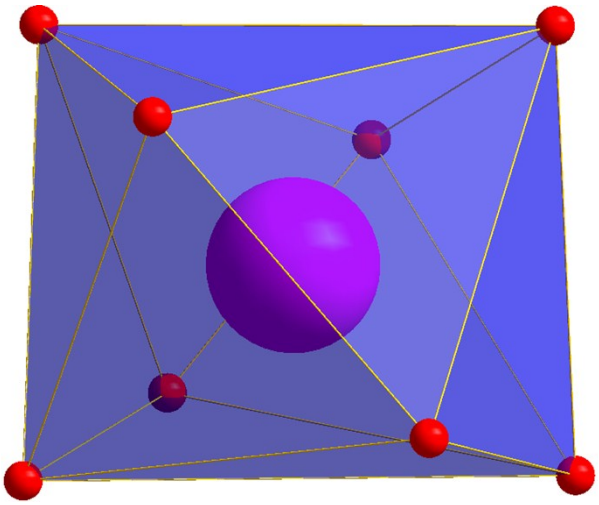

Figure S8 Polyhedral representation of the coordination sphere of the Sm^{3+} centre, displaying a distorted square antiprism arrangement in coordination polymer **3-Sm**.

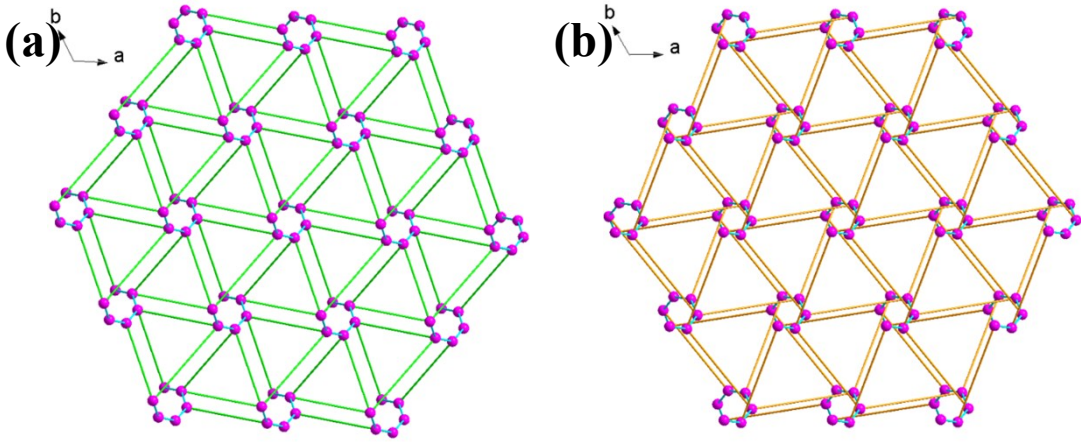

Figure S9 (a) The simplified 3-D diagram constructed by C5–H5A···O7 hydrogen bonding. (b) The simplified 3-D diagram constructed by C11–H11A···O8 hydrogen bonding.

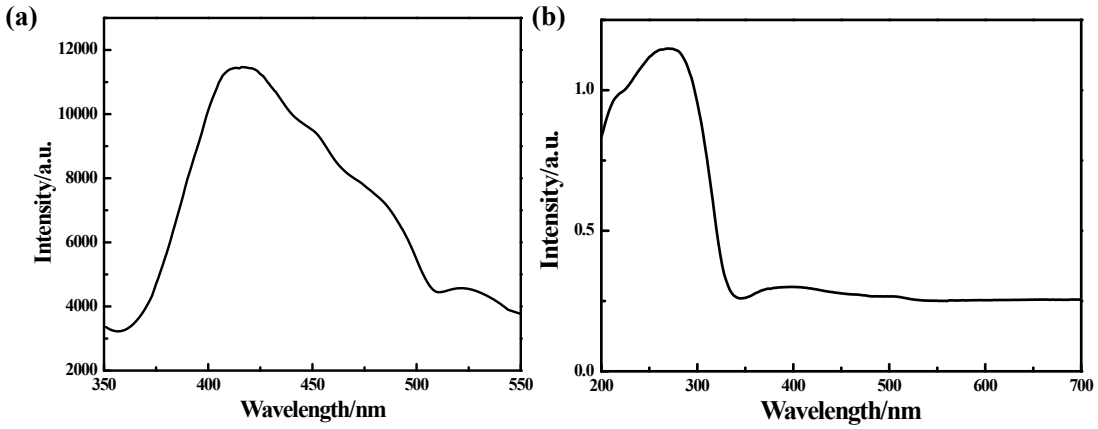

Figure S10 (a) The phosphorescence spectrum of coordination polymer **5-Gd** at 77K. (b) The solid UV-vis absorption spectrum of Hpyc ligand.

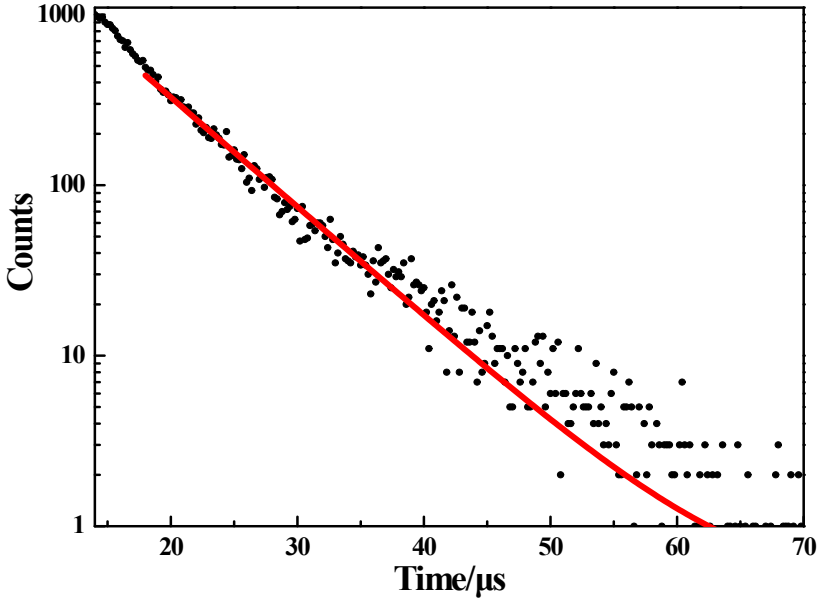

Figure S11 The solid state luminescence delay curve of **3-Sm**.

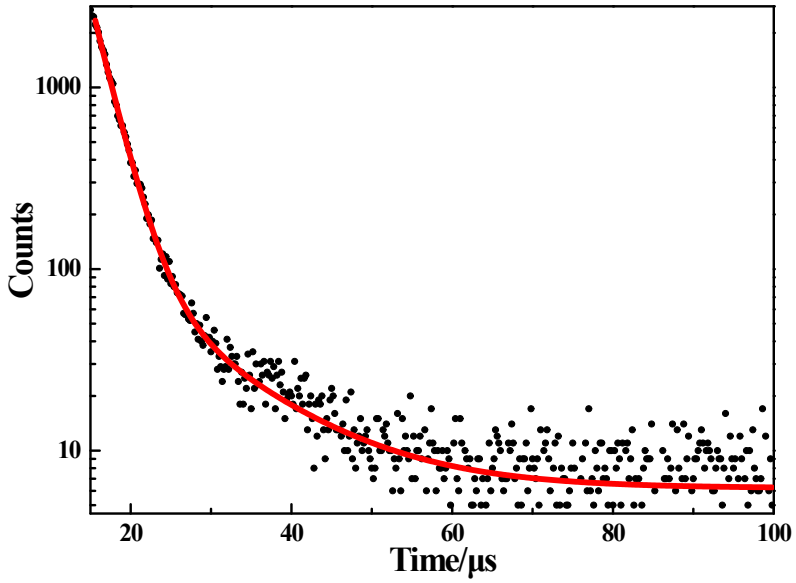

Figure S12 The solid state luminescence delay curve of **2-Nd**.

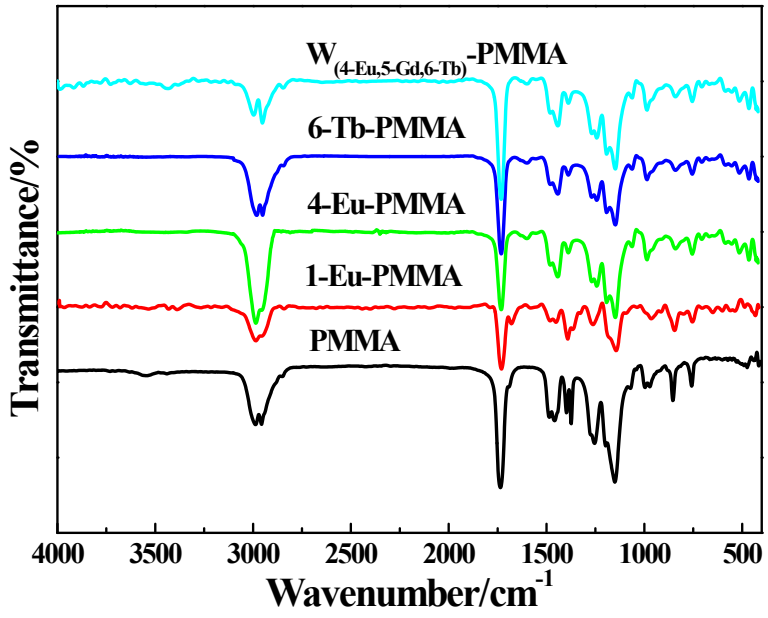

Figure S13 Infrared spectra of PMMA, **1-Eu**-PMMA, **4-Eu**-PMMA, and **6-Tb**-PMMA.

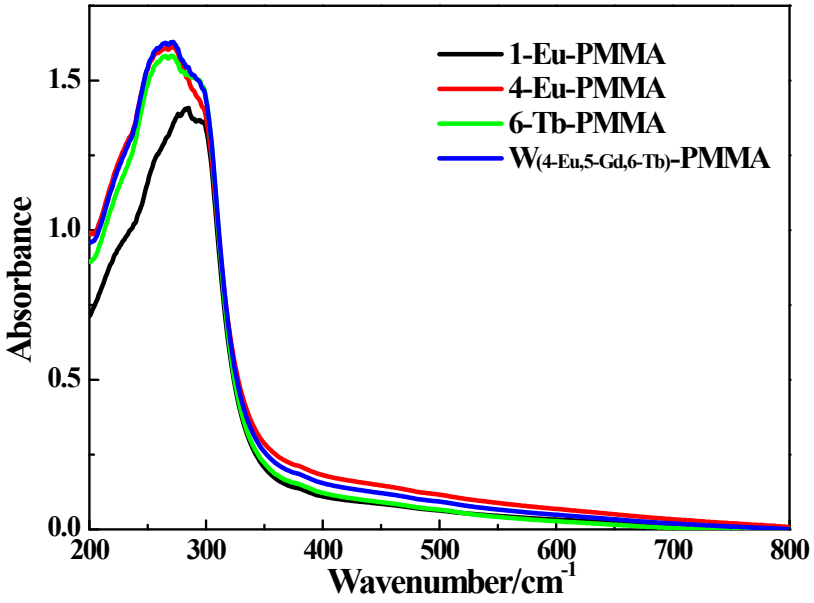

Figure S14 The solid UV-vis absorption spectrum of **1-Eu**-PMMA, **4-Eu**-PMMA, **6-Tb**-PMMA, and **W**$_{(4\text{-Eu,5-Gd,6-Tb})}$-PMMA.

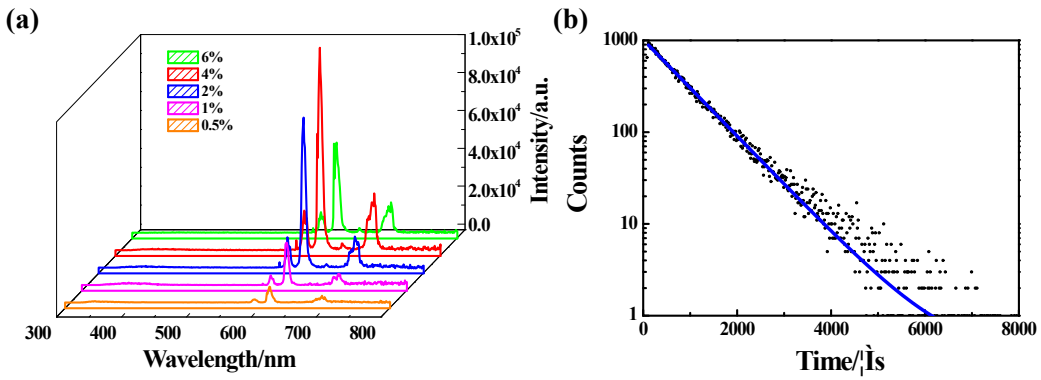

Figure S15 The luminescence (a)emission spectra and (b)delay curve of **1-Eu**-PMMA.

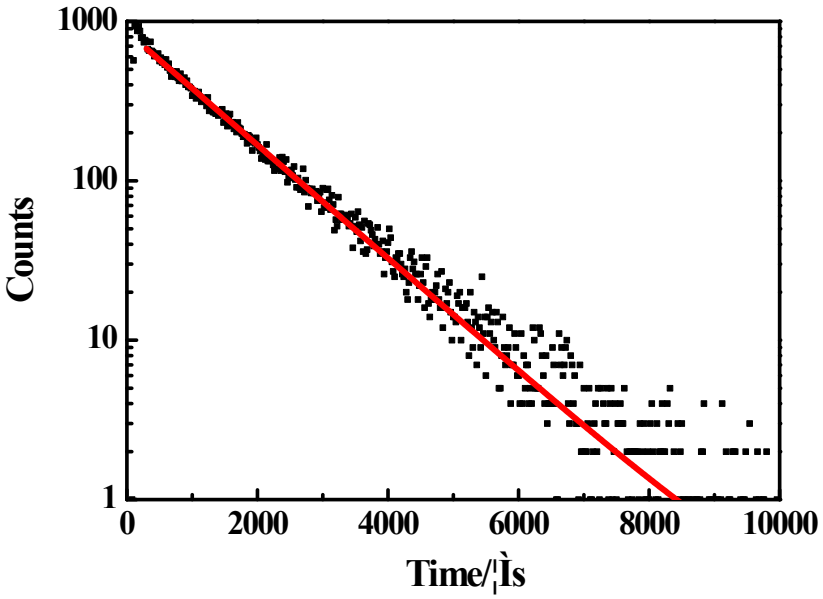

Figure S16 The luminescence delay curve of **4-Eu**-PMMA.

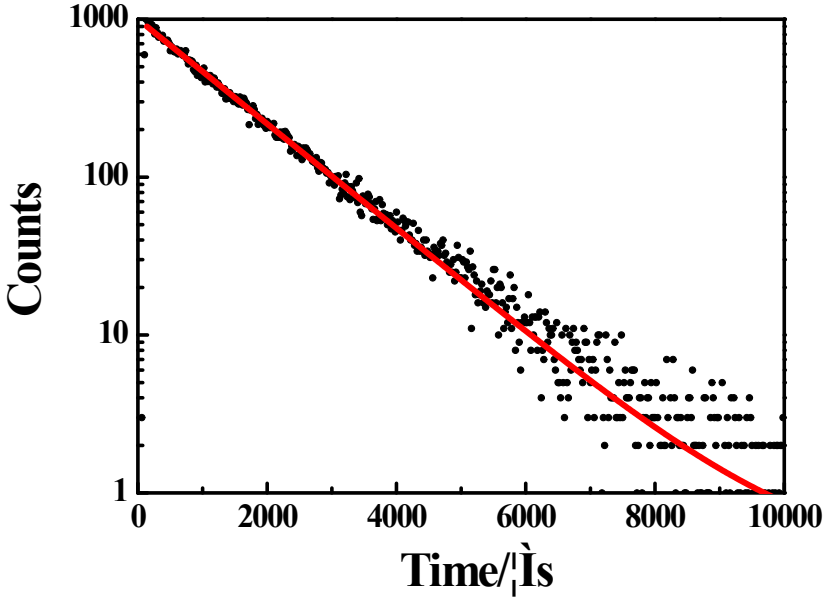

Figure S17 The luminescence delay curve of **6-Tb**-PMMA.

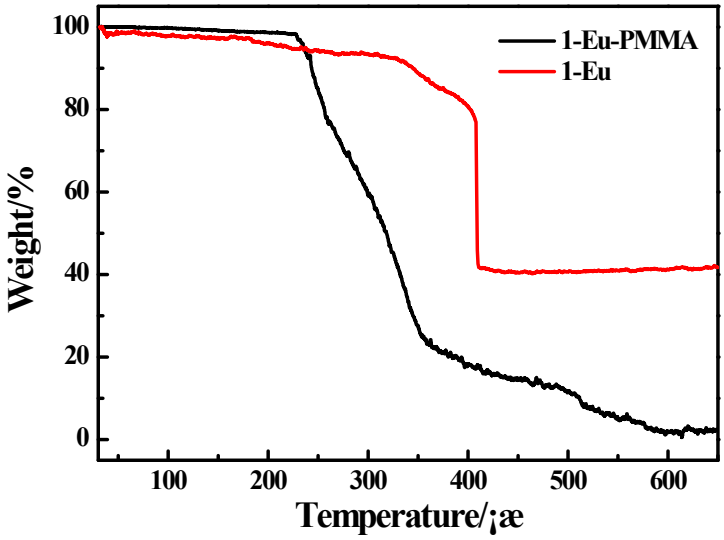

Figure S18 TG curves of **1-Eu** and **1-Eu**-PMMA.

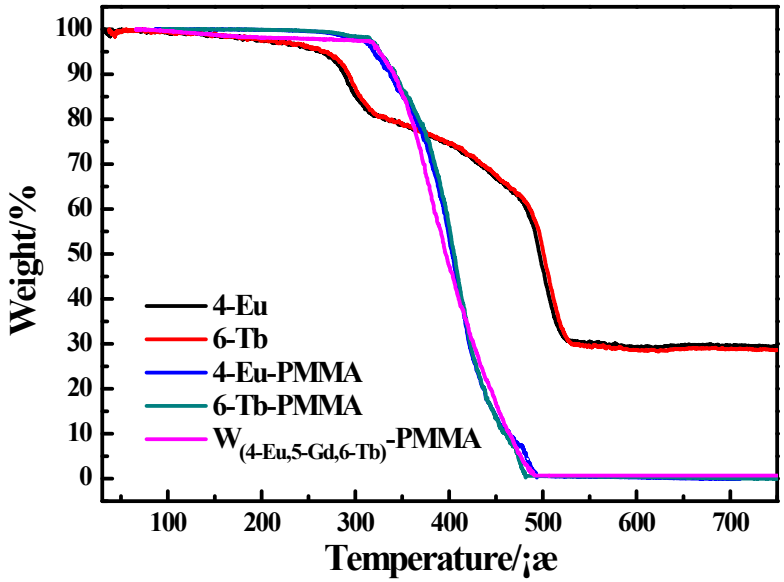

Figure S19 TG curves of **4-Eu**, **6-Tb**, **4-Eu**-PMMA, **6-Tb**-PMMA and $\mathbf{W}_{(4\text{-Eu},5\text{-Gd},6\text{-Tb})}$-PMMA.

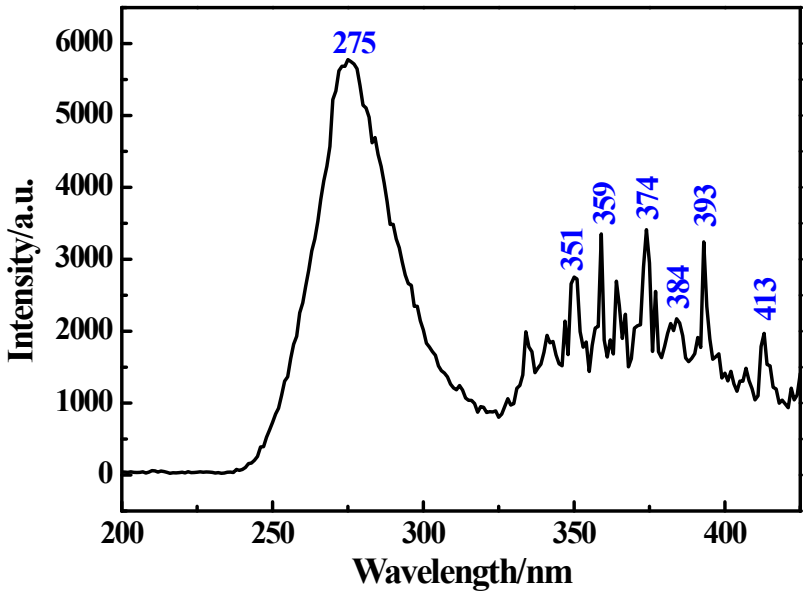

Figure S20 The excitation spectra of $\mathbf{W}_{(4\text{-}Eu,5\text{-}Gd,6\text{-}Tb)}$-PMMA.

Table S1 Selected luminescent materials doped with PMMA matrix.

Coordination polymers / compound	Luminescent color	Reference
N-phenyl-N-(4-(quinolin-2-yl)phenyl)benzenamine	blue	ACS Appl. Mater. Interfaces, 2016, 8, 33034
tris(4-(quinolin-2-yl)phenyl)amine	blue	ACS Appl. Mater. Interfaces, 2016, 8, 33034
$Eu(TTA)_2Tpy\text{-}OCH_3\cdot 2H_2O$	red	J Mater Sci: Mater Electron, 2016, 27:11284
$Eu(tta)_3\cdot 2H_2O$	red	Optical Materials, 2016, 55, 78
$NaYF_4:Yb^{3+}, Er^{3+}$	NIR	Adv. Mater., 2016, 28, 2518
[Eu(DBM)$_3$(5-Br-2,2′-bpy)]	red	Inorg. Chem. Comm.,2016, 64,13
Yb(hfpyr)$_3$(bath)	NIR	RSC Adv., 2016,6, 69509
Re(L)(CO)$_3$(cbz$_2$phen)	green	Dalton Trans., 2016,45, 11688
$NaYF_4:Er^{3+},Yb^{3+}$	NIR	J. Mater. Chem. C, 2016,4, 497
$Cu_2I_2(L1)_2$	green	ChemPlusChem, 2015, 80,1235
$[Cu_3I_3(bib)_{1.5}]_n$	yellow	J. Mater. Chem. C, 2015,3, 6249
$[Cu_4I_4(bix)_2]_n$	red	J. Mater. Chem. C, 2015,3, 6249
$[Zn(L^1)(Py)Ln(L^2)_3]$ (Ln = Nd, Yb, Er)	NIR	New J. Chem., 2015,39, 3698
$[Eu(qlc)_2(phen)(NO_3)]\cdot H_2O$	red	RSC Adv., 2015,5, 38254
$Eu(qlc)_2(H_2O)_4]\cdot(qlc)\cdot(H_2O)$	red	RSC Adv., 2015,5, 38254
$[CuI(3\text{-}Hqlc)]_n$	yellow	RSC Adv., 2015,5, 17343
$\{[Tb_3(L)(\mu_3\text{-}OH)_7]\cdot H_2O\}_n$	green	Dalton Trans., 2015,44, 2871
$NaGd(WO_4)_2:Yb^{3+}/Tm^{3+}$	NIR	Nanoscale, 2015,7, 1363
$Zn(L^n)(Py)Nd(NO_3)_3$	NIR	Inorg. Chem., 2014, 53, 5950

Table S2 Summary of coordination polymers based on pyridine-dicarboxylic acid.

Coordination polymers	Dimension	Ligand	Reference
$[Ba_2Ga_2(pydc)_4(OH)_2(H_2O)_2]\cdot 3H_2O$	3D	pyridine-2,5-dicarboxylic acid	Inorg. Chem. Comm.,2016, 70, 86
$[Sm(pydc)(Hpydc)(H_2O)_5]\cdot 4H_2O$	1D	pyridine-2,5-dicarboxylic acid	Z. Anorg. Allg. Chem., 2016, 642, 681
$[Ce(pydc)(bdc)(H_2O)]_n$	3D	pyridine-2,5-dicarboxylic acid	
$[Nd_2(dipic)_3(H_2O)_3]_n$	3D	pyridine-3,5-dicarboxylic acid	

$[Pr_2Ag_2(dipic)_4(H_2O)_5]_n \cdot 5nH_2O$	2D	pyridine-3,5-dicarboxylic acid	
$\{[LnAg_2(IN)_4(H_2O)_5]\cdot NO_3\cdot 2H_2O\}_n$ (Ln=Ho, Tb)	0D/1D	isonicotinic acid	Journal of Solid State Chemistry, 2016, 235, 193
$\{[PrAg_2(IN)_4(H_2O)_2]\cdot NO_3\cdot H_2O\}_n$	2D	isonicotinic acid	
$[LnAg(pdc)_2]_n$ (Ln=Eu, Pr)	3D/2D	pyridine-3,4-dicarboxylic acid	
$[Cd(Pydc)_2(H_2O)_2].H_2O$	2D	pyridine-2,5-dicarboxylic acid	Synthesis and Reactivity in Inorganic, Metal-Organic, and Nano-Metal Chemistry, 2016, 46, 98
$[Cu_2(PDA)_2(Ald)_2(H_2O)_2]\cdot 8H_2O$	0D	pyridine-2,4-dicarboxylic acid	RSC Adv., 2016, 6, 37515
$[Cd_2K_4(2,3\text{-}PDC)_4]$	3D	pyridine-2,3-dicarboxylic acid	RSC Adv., 2015, 5, 97831
$[Cd_2(PDA)_2(H_2O)_3]_n$	1D	pyridine-2,6-dicarboxylic acid	Journal of Coordination Chemistry, 2015, 904
[Cu(dipic)(μ-dipic)Cu(II)$(H_2O)5]\cdot 2H_2O$	0D	pyridine-2,6-dicarboxylic acid	CrystEngComm, 2014, 16, 6149
[Cu3(dipic)4(en)2]$\cdot enH_2\cdot 4H_2O$	0D	pyridine-2,6-dicarboxylic acid	
$[Ln_2(PDC)_3(H_2O)_2(DMF)]$ $4H_2O$ (Ln=La, Pr, Sm)	3D	pyridine-3,5-dicarboxylic acid	RSC Adv., 2016, 6, 63425
$[(CH_3)_2NH_2][Ln_2(PDC)_3(HCOO)(H_2O)_3]$ $2H_2O$ (Ln=Tb, Ho)	2D		
$[Ln(HPDC)_3(H_2O)_2]$ H_2O (Ln=Er, Lu)	1D		
$[Cu(PDA)(Phen)(H_2O)]_2\cdot 5H_2O$	3D	pyridine-2,6-dicarboxylic acid	Russian Journal of Coordination Chemistry, 2014, 304
$[Cd(2,3\text{-}pydc)]_n$	2D	pyridine-2,3-dicarboxylic acid	CrystEngComm, 2015, 17, 3619
$\{[Cd_2(2,3\text{-}pydc)(bpy)_2(NO_3)(H_2O)_2]\cdot(NO_3)\cdot 3H_2O\}_n$	3D	pyridine-2,3-dicarboxylic acid	
$[Cd_2(2,3\text{-}pydc)_2(H_2O)]_n$	3D	pyridine-2,3-dicarboxylic acid	
$[Ln(C_7H_3NO_4)(C_7H_4NO_4)(H_2O)]_n$ (Ln = Pr, Nd, Sm, Eu, and Tb)	2D	pyridine-2,3-dicarboxylic acid	Inorg. Chim. Acta, 2012, 392, 46

Table S3 Selected bond lengths in coordination polymers **1-Eu** ~ **8-Er**.

1-Eu					
Eu(1)-O(9)	2.38(1)	Eu(1)-O(13)	2.42(1)	Eu(1)-O(1)	2.54(1)
Eu(1)-O(5)	2.38(1)	Eu(1)-O(1)	2.44(1)	Eu(1)-N(1)	2.64(2)
Eu(1)-O(7)	2.41(1)	Eu(1)-O(3)	2.47(1)	Eu(1)-O(4)	2.73(1)
Eu(2)-O(12)	2.37(2)	Eu(2)-O(10)	2.46(1)	Eu(2)-O(8)	2.56(1)
Eu(2)-O(3)	2.40(1)	Eu(2)-O(2)	2.46(1)	Eu(2)-O(7)	2.63(1)
Eu(2)-O(6)	2.42(1)	Eu(2)-N(3)	2.54(2)	Eu(2)-N(2)	2.63(2)
2-Nd					
Nd(1)-O(5)	2.35(1)	Nd(1)-O(1)	2.42(1)	Nd(1)-O(7)	2.56(1)
Nd(1)-O(2)	2.36(1)	Nd(1)-O(6)	2.48(1)	Nd(1)-O(8)	2.56(1)
Nd(1)-O(3)	2.37(1)	Nd(1)-O(4)	2.49(1)		
3-Sm					
Sm(1)-O(2)	2.30(2)	Sm(1)-O(3)	2.41(3)	Sm(1)-O(7)	2.52(2)
Sm(1)-O(4)	2.33(2)	Sm(1)-O(1)	2.43(2)	Sm(1)-O(8)	2.53(2)
Sm(1)-O(5)	2.33(2)	Sm(1)-O(6)	2.49(2)		
4-Eu					
Eu(1)-O(1)	2.30(1)	Eu(1)-O(5)	2.39(1)	Eu(1)-O(7)	2.51(1)
Eu(1)-O(6)	2.32(1)	Eu(1)-O(2)	2.44(1)	Eu(1)-O(8)	2.53(1)
Eu(1)-O(4)	2.34(1)	Eu(1)-O(3)	2.46(1)		
5-Gd					
Gd(1)-O(6)	2.28(1)	Gd(1)-O(1)	2.37(1)	Gd(1)-O(7)	2.48(1)
Gd(1)-O(2)	2.31(1)	Gd(1)-O(5)	2.43(1)	Gd(1)-O(8)	2.52(1)
Gd(1)-O(4)	2.34(1)	Gd(1)-O(3)	2.44(1)		
6-Tb					
Tb(1)-O(6)	2.28(1)	Tb(1)-O(2)	2.36(1)	Tb(1)-O(8)	2.48(1)
Tb(1)-O(1)	2.30(1)	Tb(1)-O(5)	2.41(1)	Tb(1)-O(7)	2.51(1)
Tb(1)-O(3)	2.32(1)	Tb(1)-O(4)	2.42(1)		
7-Ho					
Ho(1)-O(2)	2.25(1)	Ho(1)-O(6)	2.34(1)	Ho(1)-O(7)	2.44(1)
Ho(1)-O(5)	2.25(1)	Ho(1)-O(1)	2.36(1)	Ho(1)-O(8)	2.48(1)
Ho(1)-O(4)	2.29(1)	Ho(1)-O(3)	2.39(1)		
8-Er					
Er(1)-O(5)	2.22(1)	Er(1)-O(4)	2.32(1)	Er(1)-O(7)	2.44(1)
Er(1)-O(3)	2.27(1)	Er(1)-O(6)	2.36(1)	Er(1)-O(8)	2.46(1)
Er(1)-O(2)	2.28(1)	Er(1)-O(1)	2.38(1)		

Table S4 Selected bond angles in coordination polymers **1-Eu** ~ **8-Er**.

1-Eu					
O(9)-Eu(1)-O(5)	139.9(4)	O(7)-Eu(1)-O(3)	70.9(4)	O(13)-Eu(1)-N(1)	74.6(5)
O(9)-Eu(1)-O(7)	75.0(5)	O(13)-Eu(1)-O(3)	121.5(5)	O(1)-Eu(1)-N(1)	62.1(5)
O(5)-Eu(1)-O(7)	139.0(5)	O(1)-Eu(1)-O(3)	145.1(4)	O(3)-Eu(1)-N(1)	139.0(5)

O(9)-Eu(1)-O(13)	76.8(5)	O(9)-Eu(1)-O(1)	141.2(4)	O(1)-Eu(1)-N(1)	112.3(5)
O(5)-Eu(1)-O(13)	76.0(5)	O(5)-Eu(1)-O(1)	70.2(4)	O(9)-Eu(1)-O(4)	67.5(4)
O(7)-Eu(1)-O(13)	144.4(5)	O(7)-Eu(1)-O(1)	69.4(5)	O(5)-Eu(1)-O(4)	76.4(4)
O(9)-Eu(1)-O(1)	134.8(4)	O(13)-Eu(1)-O(1)	142.0(5)	O(7)-Eu(1)-O(4)	115.2(4)
O(5)-Eu(1)-O(1)	72.5(4)	O(1)-Eu(1)-O(1)	66.3(5)	O(13)-Eu(1)-O(4)	72.3(4)
O(7)-Eu(1)-O(1)	97.0(4)	O(3)-Eu(1)-O(1)	78.9(4)	O(1)-Eu(1)-O(4)	146.3(4)
O(13)-Eu(1)-O(1)	87.6(5)	O(9)-Eu(1)-N(1)	72.8(5)	O(3)-Eu(1)-O(4)	49.7(4)
O(9)-Eu(1)-O(3)	75.2(4)	O(5)-Eu(1)-N(1)	126.0(5)	O(1)-Eu(1)-O(4)	114.6(4)
O(5)-Eu(1)-O(3)	94.9(5)	O(7)-Eu(1)-N(1)	76.6(5)	N(1)-Eu(1)-O(4)	132.8(4)
O(12)-Eu(2)-O(3)	78.0(5)	O(6)-Eu(2)-N(3)	76.2(5)	O(10)-Eu(2)-O(7)	97.5(4)
O(12)-Eu(2)-O(6)	118.0(5)	O(10)-Eu(2)-N(3)	64.9(5)	O(2)-Eu(2)-O(7)	82.1(5)
O(3)-Eu(2)-O(6)	73.7(5)	O(2)-Eu(2)-N(3)	76.1(5)	N(3)-Eu(2)-O(7)	125.5(5)
O(12)-Eu(2)-O(10)	76.0(5)	O(12)-Eu(2)-O(8)	103.1(5)	O(8)-Eu(2)-O(7)	49.9(4)
O(3)-Eu(2)-O(10)	153.0(5)	O(3)-Eu(2)-O(8)	113.0(4)	O(12)-Eu(2)-N(2)	76.5(5)
O(6)-Eu(2)-O(10)	125.4(4)	O(6)-Eu(2)-O(8)	138.7(5)	O(3)-Eu(2)-N(2)	108.8(5)
O(12)-Eu(2)-O(2)	145.9(5)	O(10)-Eu(2)-O(8)	67.1(5)	O(6)-Eu(2)-N(2)	63.0(5)
O(3)-Eu(2)-O(2)	71.0(5)	O(2)-Eu(2)-O(8)	77.1(5)	O(10)-Eu(2)-N(2)	71.4(5)
O(6)-Eu(2)-O(2)	66.6(4)	N(3)-Eu(2)-O(8)	76.5(5)	O(2)-Eu(2)-N(2)	126.7(5)
O(10)-Eu(2)-O(2)	131.6(5)	O(12)-Eu(2)-O(7)	73.3(5)	N(3)-Eu(2)-N(2)	76.5(5)
O(12)-Eu(2)-N(3)	137.7(5)	O(3)-Eu(2)-O(7)	68.3(4)	O(8)-Eu(2)-N(2)	137.1(5)
O(3)-Eu(2)-N(3)	142.1(5)	O(6)-Eu(2)-O(7)	136.9(4)	O(7)-Eu(2)-N(2)	149.6(5)
2-Nd					
O(5)-Nd(1)-O(2)	158.9(4)	O(3)-Nd(1)-O(4)	71.1(4)	O(1)-Nd(1)-O(8)	72.9(4)
O(5)-Nd(1)-O(3)	81.9(4)	O(1)-Nd(1)-O(4)	73.5(4)	O(6)-Nd(1)-O(8)	71.3(4)
O(2)-Nd(1)-O(3)	82.4(4)	O(6)-Nd(1)-O(4)	143.4(4)	O(4)-Nd(1)-O(8)	137.6(4)
O(5)-Nd(1)-O(1)	101.2(4)	O(5)-Nd(1)-O(7)	127.1(3)	O(7)-Nd(1)-O(8)	49.8(3)
O(2)-Nd(1)-O(1)	83.6(4)	O(2)-Nd(1)-O(7)	74.0(4)	O(5)-Nd(1)-N(4)	103.3(4)
O(3)-Nd(1)-O(1)	143.9(4)	O(3)-Nd(1)-O(7)	132.8(3)	O(2)-Nd(1)-N(4)	97.7(4)
O(5)-Nd(1)-O(6)	82.1(3)	O(1)-Nd(1)-O(7)	73.5(4)	O(3)-Nd(1)-N(4)	145.3(4)
O(2)-Nd(1)-O(6)	106.8(4)	O(6)-Nd(1)-O(7)	75.1(4)	O(1)-Nd(1)-N(4)	69.6(4)
O(3)-Nd(1)-O(6)	73.6(4)	O(4)-Nd(1)-O(7)	138.2(4)	O(6)-Nd(1)-N(4)	73.2(4)
O(1)-Nd(1)-O(6)	142.5(4)	O(5)-Nd(1)-O(8)	77.8(3)	O(4)-Nd(1)-N(4)	143.1(4)
O(5)-Nd(1)-O(4)	84.1(3)	O(2)-Nd(1)-O(8)	122.9(4)	O(7)-Nd(1)-N(4)	24.5(4)
O(2)-Nd(1)-O(4)	77.5(3)	O(3)-Nd(1)-O(8)	141.4(4)	O(8)-Nd(1)-N(4)	25.5(3)
3-Sm					
O(2)-Sm(1)-O(4)	158.6(7)	O(5)-Sm(1)-O(6)	70.4(7)	O(3)-Sm(1)-O(8)	74.1(8)
O(2)-Sm(1)-O(5)	82.6(7)	O(3)-Sm(1)-O(6)	73.4(8)	O(1)-Sm(1)-O(8)	74.6(7)
O(4)-Sm(1)-O(5)	82.5(8)	O(1)-Sm(1)-O(6)	143.0(7)	O(6)-Sm(1)-O(8)	139.2(7)
O(2)-Sm(1)-O(3)	100.3(8)	O(2)-Sm(1)-O(7)	77.7(7)	O(7)-Sm(1)-O(8)	50.0(6)
O(4)-Sm(1)-O(3)	82.7(9)	O(4)-Sm(1)-O(7)	123.0(7)	O(2)-Sm(1)-N(4)	103.3(8)
O(5)-Sm(1)-O(3)	143.0(8)	O(5)-Sm(1)-O(7)	141.9(8)	O(4)-Sm(1)-N(4)	97.6(8)
O(2)-Sm(1)-O(1)	83.5(8)	O(3)-Sm(1)-O(7)	73.2(8)	O(5)-Sm(1)-N(4)	145.9(9)
O(4)-Sm(1)-O(1)	107.0(8)	O(1)-Sm(1)-O(7)	71.7(8)	O(3)-Sm(1)-N(4)	69.8(8)
O(5)-Sm(1)-O(1)	74.0(7)	O(6)-Sm(1)-O(7)	137.1(8)	O(1)-Sm(1)-N(4)	73.5(8)

O(3)-Sm(1)-O(1)	143.0(8)	O(2)-Sm(1)-O(8)	127.2(7)	O(6)-Sm(1)-N(4)	143.2(8)
O(2)-Sm(1)-O(6)	82.6(7)	O(4)-Sm(1)-O(8)	74.1(7)	O(7)-Sm(1)-N(4)	25.7(7)
O(4)-Sm(1)-O(6)	78.0(7)	O(5)-Sm(1)-O(8)	132.8(7)	O(8)-Sm(1)-N(4)	24.5(8)
4-Eu					
O(1)-Eu(1)-O(6)	159.4(3)	O(4)-Eu(1)-O(3)	71.0(3)	O(5)-Eu(1)-O(8)	73.3(3)
O(1)-Eu(1)-O(4)	82.4(3)	O(5)-Eu(1)-O(3)	73.0(3)	O(2)-Eu(1)-O(8)	71.5(3)
O(6)-Eu(1)-O(4)	82.4(3)	O(2)-Eu(1)-O(3)	143.7(3)	O(3)-Eu(1)-O(8)	136.9(3)
O(1)-Eu(1)-O(5)	100.3(3)	O(1)-Eu(1)-O(7)	127.1(3)	O(7)-Eu(1)-O(8)	50.8(3)
O(6)-Eu(1)-O(5)	83.9(3)	O(6)-Eu(1)-O(7)	73.5(3)	O(1)-Eu(1)-N(4)	102.6(3)
O(4)-Eu(1)-O(5)	143.3(3)	O(4)-Eu(1)-O(7)	133.1(3)	O(6)-Eu(1)-N(4)	97.9(3)
O(1)-Eu(1)-O(2)	83.1(3)	O(5)-Eu(1)-O(7)	73.8(3)	O(4)-Eu(1)-N(4)	145.3(3)
O(6)-Eu(1)-O(2)	105.8(3)	O(2)-Eu(1)-O(7)	74.9(3)	O(5)-Eu(1)-N(4)	70.4(3)
O(4)-Eu(1)-O(2)	73.9(3)	O(3)-Eu(1)-O(7)	138.1(3)	O(2)-Eu(1)-N(4)	72.7(3)
O(5)-Eu(1)-O(2)	142.8(3)	O(1)-Eu(1)-O(8)	76.9(3)	O(3)-Eu(1)-N(4)	143.4(3)
O(1)-Eu(1)-O(3)	83.5(3)	O(6)-Eu(1)-O(8)	123.4(3)	O(7)-Eu(1)-N(4)	25.0(3)
O(6)-Eu(1)-O(3)	78.4(3)	O(4)-Eu(1)-O(8)	141.3(3)	O(8)-Eu(1)-N(4)	25.8(3)
5-Gd					
O(6)-Gd(1)-O(2)	159.5(5)	O(4)-Gd(1)-O(3)	71.5(4)	O(1)-Gd(1)-O(8)	72.7(5)
O(6)-Gd(1)-O(4)	82.7(5)	O(1)-Gd(1)-O(3)	72.8(5)	O(5)-Gd(1)-O(8)	71.7(4)
O(2)-Gd(1)-O(4)	82.3(5)	O(5)-Gd(1)-O(3)	144.2(5)	O(3)-Gd(1)-O(8)	136.4(4)
O(6)-Gd(1)-O(1)	99.6(4)	O(6)-Gd(1)-O(7)	126.8(4)	O(7)-Gd(1)-O(8)	50.9(4)
O(2)-Gd(1)-O(1)	84.6(5)	O(2)-Gd(1)-O(7)	73.7(5)	O(6)-Gd(1)-N(4)	102.6(5)
O(4)-Gd(1)-O(1)	143.8(5)	O(4)-Gd(1)-O(7)	132.6(4)	O(2)-Gd(1)-N(4)	97.7(5)
O(6)-Gd(1)-O(5)	83.5(4)	O(1)-Gd(1)-O(7)	74.2(4)	O(4)-Gd(1)-N(4)	145.6(5)
O(2)-Gd(1)-O(5)	105.5(4)	O(5)-Gd(1)-O(7)	74.4(4)	O(1)-Gd(1)-N(4)	69.7(5)
O(4)-Gd(1)-O(5)	73.7(5)	O(3)-Gd(1)-O(7)	138.2(4)	O(5)-Gd(1)-N(4)	73.2(4)
O(1)-Gd(1)-O(5)	142.5(5)	O(6)-Gd(1)-O(8)	76.5(4)	O(3)-Gd(1)-N(4)	142.5(4)
O(6)-Gd(1)-O(3)	83.7(4)	O(2)-Gd(1)-O(8)	123.6(5)	O(7)-Gd(1)-N(4)	24.9(4)
O(2)-Gd(1)-O(3)	78.3(4)	O(4)-Gd(1)-O(8)	141.2(5)	O(8)-Gd(1)-N(4)	26.1(4)
6-Tb					
O(6)-Tb(1)-O(1)	160.05(16)	O(3)-Tb(1)-O(4)	71.23(15)	O(2)-Tb(1)-O(7)	73.07(16)
O(6)-Tb(1)-O(3)	82.98(16)	O(2)-Tb(1)-O(4)	73.24(16)	O(5)-Tb(1)-O(7)	71.71(15)
O(1)-Tb(1)-O(3)	82.24(17)	O(5)-Tb(1)-O(4)	143.71(16)	O(4)-Tb(1)-O(7)	136.63(15)
O(6)-Tb(1)-O(2)	99.98(16)	O(6)-Tb(1)-O(8)	126.76(16)	O(8)-Tb(1)-O(7)	51.19(14)
O(1)-Tb(1)-O(2)	84.36(16)	O(1)-Tb(1)-O(8)	73.17(16)	O(6)-Tb(1)-N(4)	101.76(15)
O(3)-Tb(1)-O(2)	143.80(17)	O(3)-Tb(1)-O(8)	132.94(15)	O(1)-Tb(1)-N(4)	98.03(16)
O(6)-Tb(1)-O(5)	83.46(15)	O(2)-Tb(1)-O(8)	73.36(16)	O(3)-Tb(1)-N(4)	145.06(16)
O(1)-Tb(1)-O(5)	105.00(15)	O(5)-Tb(1)-O(8)	74.97(16)	O(2)-Tb(1)-N(4)	70.16(16)
O(3)-Tb(1)-O(5)	73.57(16)	O(4)-Tb(1)-O(8)	137.95(16)	O(5)-Tb(1)-N(4)	72.66(16)
O(2)-Tb(1)-O(5)	142.57(16)	O(6)-Tb(1)-O(7)	76.00(16)	O(4)-Tb(1)-N(4)	143.39(16)
O(6)-Tb(1)-O(4)	83.80(16)	O(1)-Tb(1)-O(7)	123.64(16)	O(8)-Tb(1)-N(4)	25.40(15)
O(1)-Tb(1)-O(4)	78.80(15)	O(3)-Tb(1)-O(7)	141.00(17)	O(7)-Tb(1)-N(4)	25.83(15)
7-Ho					
O(2)-Ho(1)-O(5)	159.6(4)	O(4)-Ho(1)-O(3)	71.0(3)	O(6)-Ho(1)-O(8)	73.1(4)

O(2)-Ho(1)-O(4)	83.0(4)	O(6)-Ho(1)-O(3)	73.1(4)	O(1)-Ho(1)-O(8)	71.9(3)
O(5)-Ho(1)-O(4)	82.5(4)	O(1)-Ho(1)-O(3)	143.6(4)	O(3)-Ho(1)-O(8)	136.3(3)
O(2)-Ho(1)-O(6)	99.1(3)	O(2)-Ho(1)-O(7)	126.7(3)	O(7)-Ho(1)-O(8)	51.4(3)
O(5)-Ho(1)-O(6)	84.3(3)	O(5)-Ho(1)-O(7)	73.6(3)	O(2)-Ho(1)-N(4)	102.0(4)
O(4)-Ho(1)-O(6)	143.6(4)	O(4)-Ho(1)-O(7)	133.1(4)	O(5)-Ho(1)-N(4)	98.0(4)
O(2)-Ho(1)-O(1)	84.2(3)	O(6)-Ho(1)-O(7)	73.9(4)	O(4)-Ho(1)-N(4)	145.7(4)
O(5)-Ho(1)-O(1)	105.2(3)	O(1)-Ho(1)-O(7)	74.6(3)	O(6)-Ho(1)-N(4)	69.8(4)
O(4)-Ho(1)-O(1)	73.7(4)	O(3)-Ho(1)-O(7)	138.5(3)	O(1)-Ho(1)-N(4)	73.1(4)
O(6)-Ho(1)-O(1)	142.7(4)	O(2)-Ho(1)-O(8)	75.7(3)	O(3)-Ho(1)-N(4)	143.0(4)
O(2)-Ho(1)-O(3)	83.1(4)	O(5)-Ho(1)-O(8)	124.1(4)	O(7)-Ho(1)-N(4)	25.1(4)
O(5)-Ho(1)-O(3)	78.7(3)	O(4)-Ho(1)-O(8)	140.9(4)	O(8)-Ho(1)-N(4)	26.3(3)
8-Er					
O(5)-Er(1)-O(3)	160.8(4)	O(2)-Er(1)-O(1)	70.9(4)	O(4)-Er(1)-O(8)	73.1(4)
O(5)-Er(1)-O(2)	84.3(4)	O(4)-Er(1)-O(1)	72.6(3)	O(6)-Er(1)-O(8)	72.0(4)
O(3)-Er(1)-O(2)	82.2(4)	O(6)-Er(1)-O(1)	144.4(4)	O(1)-Er(1)-O(8)	135.8(3)
O(5)-Er(1)-O(4)	98.8(4)	O(5)-Er(1)-O(7)	125.4(4)	O(7)-Er(1)-O(8)	51.6(3)
O(3)-Er(1)-O(4)	84.1(4)	O(3)-Er(1)-O(7)	73.7(4)	O(5)-Er(1)-N(4)	101.4(4)
O(2)-Er(1)-O(4)	142.9(4)	O(2)-Er(1)-O(7)	132.7(4)	O(3)-Er(1)-N(4)	97.4(4)
O(5)-Er(1)-O(6)	84.3(4)	O(4)-Er(1)-O(7)	74.7(3)	O(2)-Er(1)-N(4)	145.9(4)
O(3)-Er(1)-O(6)	105.0(4)	O(6)-Er(1)-O(7)	73.4(4)	O(4)-Er(1)-N(4)	70.0(3)
O(2)-Er(1)-O(6)	74.5(4)	O(1)-Er(1)-O(7)	138.8(4)	O(6)-Er(1)-N(4)	72.8(4)
O(4)-Er(1)-O(6)	142.6(4)	O(5)-Er(1)-O(8)	74.4(4)	O(1)-Er(1)-N(4)	142.7(3)
O(5)-Er(1)-O(1)	84.2(4)	O(3)-Er(1)-O(8)	124.2(4)	O(7)-Er(1)-N(4)	24.6(4)
O(3)-Er(1)-O(1)	78.5(3)	O(2)-Er(1)-O(8)	141.6(4)	O(8)-Er(1)-N(4)	27.1(3)

Table S5 Luminescence data for coordination polymers **1-Eu** ~ **6-Tb**.

Coordination polymers	Emission transitions	λ_{em} (nm)	τ (μs)
1-Eu	$^5D_0 \rightarrow {}^7F_J$ (J = 0–4)	579, 591, 615, 652, 696	648.68
2-Nd	$^4F_{3/2} \rightarrow {}^4I_{J/2}$ (J = 9, 11, 13)	891, 1057, 1330	6.84
3-Sm	$^4G_{5/2} \rightarrow {}^6H_{J/2}$ (J = 5, 7, 9, 11)	562, 597, 644,704	6.75
4-Eu	$^5D_0 \rightarrow {}^7F_J$ (J = 0–4)	579, 592, 618, 653, 699	1012.58
5-Gd[a]	π*→π	418	-
6-Tb	$^5D_4 \rightarrow {}^7F_J$ (J = 6–2)	489, 542, 590, 620, 650	1247.74

[a] The luminescent properties of coordination polymer **5-Gd** was measured at 77K.