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Supporting Informatin

Water-stable Ln^{III}-based coordination polymers displaying slow magnetic relaxation and luminescent sensing properties

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Table S1 Crystallographic Details for CPs **1-6**.

Compounds	Sm-CP **(1)**	Eu-CP **(2)**	Gd-CP **(3)**	Tb-CP **(4)**	Dy-CP **(5)**	Ho-CP **(6)**
Empirical formula	$C_{42}H_{34}Sm_2N_4O_{19}$	$C_{42}H_{34}Eu_2N_4O_{19}$	$C_{42}H_{34}Gd_2N_4O_{19}$	$C_{42}H_{34}Tb_2N_4O_{19}$	$C_{42}H_{34}Dy_2N_4O_{19}$	$C_{42}H_{34}Ho_2N_4O_{19}$
Formula weight	1199.45	1202.65	1213.23	1216.59	1223.73	1228.59
Crystal system	Monoclinic	Monoclinic	Monoclinic	Monoclinic	Monoclinic	Monoclinic
Space group	$P2_1/c$	$P2_1/c$	$P2_1/c$	$P2_1/c$	$P2_1/c$	$P2_1/c$
a /Å	16.044(3)	16.050(3)	16.026(2)	16.013(3)	16.044(6)	16.010(5)
b /Å	13.665(3)	13.653(3)	13.6349(17)	13.636(3)	13.656(5)	13.588(4)
c /Å	23.654(3)	23.678(3)	23.5391(19)	23.533(3)	23.514(7)	23.465(5)
β /°	123.091(9)	123.116(9)	122.957(5)	123.104(9)	123.001(18)	123.070(14)
V /Å^3	4344.8(14)	4345.8(14)	4315.9(8)	4304.4(14)	4321(3)	4278(2)
Z	4	4	4	4	4	4
Dc (g m^{-3})	1.834	1.838	1.867	1.877	1.881	1.908
μ (mm^{-1})	2.762	2.945	3.133	3.345	3.518	3.759
F(000)	2360	2368	2375	2383	2391	2399

Reflns collected	26993	26886	27013	26736	25556	26645
Unique reflections	9915	9932	9962	9877	9676	9801
GOF on F^2	1.032	1.032	0.997	0.995	1.013	1.031
R_{int}	0.0307	0.0311	0.0444	0.0327	0.0506	0.0377
R_1 [I>2σ(I)]	0.0249	0.0248	0.0320	0.0243	0.0340	0.0281
wR_2 (all data)	0.0584	0.0584	0.0653	0.0565	0.0842	0.0630

Table S2 Selected bond lengths (Å) and angles (°) for Sm-CP (**1**)

Sm1-O7A	2.3086(19)	Sm1-O2	2.390(2)
Sm1-O11	2.3928(18)	Sm1-O8B	2.432(2)
Sm1-O4C	2.441(2)	Sm1-O14D	2.462(2)
Sm1-O13D	2.497(2)	Sm1-O9B	2.533(2)
Sm2-O18	2.347(3)	Sm2-O6	2.368(2)
Sm2-O3C	2.372(2)	Sm2-O12	2.473(2)
Sm2-O17	2.476(2)	Sm2-O16	2.476(2)
Sm2-O1	2.501(2)	Sm2-O2	2.626(2)
Sm2-O11	2.704(2)		
O7A-Sm1-O2	74.60(7)	O7A-Sm1-O11	140.90(7)
O2-Sm1-O11	74.35(7)	O7A-Sm1-O8B	81.14(7)
O2-Sm1-O8B	90.55(7)	O11-Sm1-O8B	122.19(7)
O7A-Sm1-O4C	85.20(8)	O2-Sm1-O4C	105.91(8)
O11-Sm1-O4C	81.07(7)	O8B-Sm1-O4C	154.99(7)
O7A-Sm1-O14D	127.30(7)	O2-Sm1-O14D	156.08(7)
O11-Sm1-O14D	88.52(7)	O8B-Sm1-O14D	84.52(8)
O4C-Sm1-O14D	87.28(8)	O7A-Sm1-O13D	74.71(7)
O2-Sm1-O13D	147.71(7)	O11-Sm1-O13D	137.75(7)

O8B-Sm1-O13D	75.01(8)	O4C-Sm1-O13D	81.24(8)
O14D-Sm1-O13D	52.59(7)	O7A-Sm1-O9B	124.35(8)
O2-Sm1-O9B	77.24(8)	O11-Sm1-O9B	70.07(7)
O8B-Sm1-O9B	52.13(7)	O4C-Sm1-O9B	149.10(7)
O14D-Sm1-O9B	81.32(8)	O13D-Sm1-O9B	112.91(7)
O18-Sm2-O6	73.35(9)	O18-Sm2-O3C	152.40(8)
O6-Sm2-O3C	79.37(9)	O18-Sm2-O12	81.96(8)
O6-Sm2-O12	136.53(8)	O3C-Sm2-O12	122.13(7)
O18-Sm2-O17	84.13(10)	O6-Sm2-O17	74.33(8)
O3C-Sm2-O17	92.57(9)	O12-Sm2-O17	67.92(8)
O18-Sm2-O16	89.30(9)	O6-Sm2-O16	73.68(8)
O3C-Sm2-O16	79.01(8)	O12-Sm2-O16	142.10(7)
O17-Sm2-O16	147.90(8)	O18-Sm2-O1	73.24(8)
O6-Sm2-O1	130.18(8)	O3C-Sm2-O1	124.15(8)
O12-Sm2-O1	72.12(7)	O17-Sm2-O1	136.25(8)
O16-Sm2-O1	70.05(7)	O18-Sm2-O2	123.77(8)
O6-Sm2-O2	140.91(7)	O3C-Sm2-O2	76.36(8)
O12-Sm2-O2	82.55(7)	O17-Sm2-O2	136.45(7)
O16-Sm2-O2	71.94(7)	O1-Sm2-O2	50.56(6)
O18-Sm2-O11	131.31(8)	O6-Sm2-O11	133.14(8)
O3C-Sm2-O11	71.96(7)	O12-Sm2-O11	50.25(7)
O17-Sm2-O11	70.86(7)	O16-Sm2-O11	132.81(7)
O1-Sm2-O11	96.65(7)	O2-Sm2-O11	65.63(6)

Symmetry codes: A : -x,y-1/2,-z+1/2; B: -x,y+1/2,-z+1/2; C:x,y-1,z; D:-x, -y, -z

Table S3 Selected bond lengths (Å) and angles (°) for Eu-CP (**2**)

Eu1-O7A	2.303(2)	Eu1-O2	2.385(2)
Eu1-O11	2.3872(18)	Eu1-O8B	2.423(2)
Eu1-O4C	2.426(2)	Eu1-O14D	2.456(2)
Eu1-O13D	2.488(2)	Eu1-O9B	2.528(2)

Eu2-O18	2.336(2)	Eu2-O6	2.358(2)
Eu2-O3C	2.359(2)	Eu2-O12	2.462(2)
Eu2-O17	2.466(2)	Eu2-O16	2.469(2)
Eu2-O1	2.497(2)	Eu2-O2	2.609(2)
Eu2-O11	2.708(2)		

O7A-Eu1-O2	74.48(8)	O7A-Eu1-O11	140.88(7)
O2-Eu1-O11	74.41(7)	O7A-Eu1-O8B	81.10(7)
O2-Eu1-O8B	91.27(7)	O11-Eu1-O8B	122.62(7)
O7A-Eu1-O4C	85.14(8)	O2-Eu1-O4C	105.19(7)
O11-Eu1-O4C	80.73(7)	O8B-Eu1-O4C	154.88(7)
O7A-Eu1-O14D	127.77(7)	O2-Eu1-O14D	155.88(7)
O11-Eu1-O14D	88.02(7)	O8B-Eu1-O14D	84.33(8)
O4C-Eu1-O14D	87.69(8)	O7A-Eu1-O13D	74.96(7)
O2-Eu1-O13D	148.12(7)	O11-Eu1-O13D	137.16(7)
O8B-Eu1-O13D	75.19(7)	O4C-Eu1-O13D	81.00(7)
O14D-Eu1-O13D	52.83(7)	O7A-Eu1-O9B	124.28(7)
O2-Eu1-O9B	77.43(8)	O11-Eu1-O9B	70.19(7)
O8B-Eu1-O9B	52.43(7)	O4C-Eu1-O9B	149.07(7)
O14D-Eu1-O9B	81.16(8)	O13D-Eu1-O9B	113.41(7)
O18-Eu2-O6	73.09(9)	O18-Eu2-O3C	151.89(8)
O6-Eu2-O3C	79.07(9)	O18-Eu2-O12	82.00(8)
O6-Eu2-O12	136.34(8)	O3C-Eu2-O12	122.30(8)
O18-Eu2-O17	84.32(10)	O6-Eu2-O17	74.34(8)
O3C-Eu2-O17	91.97(9)	O12-Eu2-O17	67.89(8)
O18-Eu2-O16	89.45(9)	O6-Eu2-O16	73.87(8)
O3C-Eu2-O16	79.06(8)	O12-Eu2-O16	142.11(7)
O17-Eu2-O16	148.05(8)	O18-Eu2-O1	73.07(8)
O6-Eu2-O1	129.73(8)	O3C-Eu2-O1	124.77(8)

O12-Eu2-O1	72.45(7)	O17-Eu2-O1	136.52(8)
O16-Eu2-O1	69.75(7)	O18-Eu2-O2	123.88(8)
O6-Eu2-O2	141.11(7)	O3C-Eu2-O2	76.91(8)
O12-Eu2-O2	82.54(7)	O17-Eu2-O2	136.21(7)
O16-Eu2-O2	71.87(7)	O1-Eu2-O2	50.82(6)
O18-Eu2-O11	131.36(8)	O6-Eu2-O11	133.06(8)
O3C-Eu2-O11	72.12(7)	O12-Eu2-O11	50.32(6)
O17-Eu2-O11	70.55(7)	O16-Eu2-O11	132.74(7)
O1-Eu2-O11	97.21(7)	O2-Eu2-O11	65.70(6)

Symmetry codes: A : -x, y-1/2, -z+1/2; B: x, y-1, z; C: -x, y+1/2, -z+1/2; D: -x, -y, -z

Table S4 Selected bond lengths (Å) and angles (°) for Gd-CP (**3**)

Gd1-O7A	2.285(3)	Gd1-O2	2.366(2)
Gd1-O11	2.372(2)	Gd1-O4B	2.402(2)
Gd1-O8C	2.405(2)	Gd1-O14D	2.444(3)
Gd1-O13D	2.476(2)	Gd1-O9B	2.520(3)
Gd2-O18	2.329(3)	Gd2-O3B	2.345(3)
Gd2-O6	2.347(3)	Gd2-O12	2.439(3)
Gd2-O17	2.446(3)	Gd2-O16	2.448(3)
Gd2-O1	2.486(2)	Gd2-O2	2.601(2)
Gd2-O11	2.693(3)		

O7A-Gd1-O2	74.67(9)	O7A-Gd1-O11	140.70(9)
O2-Gd1-O11	73.95(9)	O7A-Gd1-O4B	84.89(10)
O2-Gd1-O4B	104.47(9)	O11-Gd1-O4B	80.66(9)
O7A-Gd1-O8C	81.32(9)	O2-Gd1-O8C	92.18(9)
O11-Gd1-O8C	122.79(8)	O4B-Gd1-O8C	154.74(9)
O7A-Gd1-O14D	127.97(9)	O2-Gd1-O14D	155.74(9)
O11-Gd1-O14D	87.94(9)	O4B-Gd1-O14D	87.93(10)
O8C-Gd1-O14D	84.08(10)	O7A-Gd1-O13D	74.81(9)

O2-Gd1-O13D	148.32(9)	O11-Gd1-O13D	137.30(9)
O4B-Gd1-O13D	80.99(9)	O8C-Gd1-O13D	75.03(9)
O14D-Gd1-O13D	53.17(9)	O7A-Gd1-O9C	124.05(9)
O2-Gd1-O9C	77.32(9)	O11-Gd1-O9C	70.34(8)
O4B-Gd1-O9C	149.36(9)	O8C-Gd1-O9C	52.44(8)
O14D-Gd1-O9C	81.49(10)	O13D-Gd1-O9C	113.87(9)
O18-Gd2-O3B	151.16(10)	O18-Gd2-O6	72.92(10)
O3B-Gd2-O6	78.51(10)	O18-Gd2-O12	82.27(10)
O3B-Gd2-O12	122.59(9)	O6-Gd2-O12	136.32(10)
O18-Gd2-O17	84.79(12)	O3B-Gd2-O17	91.31(12)
O6-Gd2-O17	74.30(11)	O12-Gd2-O17	68.02(10)
O18-Gd2-O16	89.27(11)	O3B-Gd2-O16	79.04(10)
O6-Gd2-O16	73.93(10)	O12-Gd2-O16	142.12(9)
O17-Gd2-O16	148.03(10)	O18-Gd2-O1	72.85(10)
O3B-Gd2-O1	125.52(10)	O6-Gd2-O1	129.65(10)
O12-Gd2-O1	72.37(9)	O17-Gd2-O1	136.59(10)
O16-Gd2-O1	69.85(9)	O18-Gd2-O2	123.99(9)
O3B-Gd2-O2	77.49(9)	O6-Gd2-O2	141.37(9)
O12-Gd2-O2	82.29(9)	O17-Gd2-O2	135.76(10)
O16-Gd2-O2	72.12(9)	O1-Gd2-O2	51.15(8)
O18-Gd2-O11	131.83(10)	O3B-Gd2-O11	72.35(9)
O6-Gd2-O11	133.21(10)	O12-Gd2-O11	50.44(8)
O17-Gd2-O11	70.69(9)	O16-Gd2-O11	132.38(8)
O1-Gd2-O11	97.12(8)	O2-Gd2-O11	65.11(8)

Symmetry codes: A : -x, y-1/2, -z+1/2; B: x, y-1, z; C: -x, y+1/2, -z+1/2; D: -x, -y, -z

Table S5 Selected bond lengths (Å) and angles (°) for Tb-CP (**4**)

Tb1-O7A	2.2769(19)	Tb1-O11	2.3502(18)
Tb1-O2	2.355(2)	Tb1-O4B	2.390(2)
Tb1-O8C	2.398(2)	Tb1-O14D	2.422(2)

Tb1-O13D	2.460(2)	Tb1-O9C	2.502(2)
Tb2-O18	2.304(3)	Tb2-O3B	2.316(3)
Tb2-O6	2.344(3)	Tb2-O12	2.424(2)
Tb2-O17	2.427(3)	Tb2-O16	2.436(2)
Tb2-O1	2.472(2)	Tb2-O2	2.583(2)
Tb2-O11	2.726(2)		

O7A-Tb1-O11	141.13(7)	O7A-Tb1-O2	74.85(8)
O11-Tb1-O2	74.23(7)	O7A-Tb1-O4B	84.74(8)
O11-Tb1-O4B	79.99(7)	O2-Tb1-O4B	103.18(7)
O7A-Tb1-O8C	80.99(7)	O11-Tb1-O8C	123.45(7)
O2-Tb1-O8C	92.92(7)	O4B-Tb1-O8C	154.89(7)
O7A-Tb1-O14D	128.49(7)	O11-Tb1-O14D	86.84(7)
O2-Tb1-O14D	155.28(7)	O4B-Tb1-O14D	88.66(8)
O8C-Tb1-O14D	84.26(8)	O7A-Tb1-O13D	75.01(7)
O11-Tb1-O13D	136.27(7)	O2-Tb1-O13D	148.94(7)
O4B-Tb1-O13D	81.31(8)	O8C-Tb1-O13D	75.11(8)
O14D-Tb1-O13D	53.50(7)	O7A-Tb1-O9C	123.86(8)
O11-Tb1-O9C	70.68(7)	O2-Tb1-O9C	77.47(8)
O4B-Tb1-O9C	149.40(7)	O8C-Tb1-O9C	52.77(7)
O14D-Tb1-O9C	81.38(8)	O13D-Tb1-O9C	114.17(7)
O18-Tb2-O3B	151.19(9)	O18-Tb2-O6	72.59(9)
O3B-Tb2-O6	78.71(9)	O18-Tb2-O12	81.86(8)
O3B-Tb2-O12	122.35(7)	O6-Tb2-O12	136.49(8)
O18-Tb2-O17	84.54(10)	O3B-Tb2-O17	90.26(10)
O6-Tb2-O17	74.47(9)	O12-Tb2-O17	68.43(8)
O18-Tb2-O16	90.30(9)	O3B-Tb2-O16	79.09(8)
O6-Tb2-O16	73.52(8)	O12-Tb2-O16	142.43(8)
O17-Tb2-O16	147.56(9)	O18-Tb2-O1	73.19(9)

O3B-Tb2-O1	125.93(9)	O6-Tb2-O1	129.04(8)
O12-Tb2-O1	72.47(7)	O17-Tb2-O1	137.21(8)
O16-Tb2-O1	70.01(7)	O18-Tb2-O2	124.50(8)
O3B-Tb2-O2	77.87(8)	O6-Tb2-O2	141.51(7)
O12-Tb2-O2	82.00(7)	O17-Tb2-O2	135.40(8)
O16-Tb2-O2	72.35(7)	O1-Tb2-O2	51.24(6)
O18-Tb2-O11	131.24(9)	O3B-Tb2-O11	72.28(8)
O3C-Tb2-O11	133.99(9)	O12-Tb2-O11	50.34(7)
O17-Tb2-O11	70.89(8)	O16-Tb2-O11	132.02(8)
O1-Tb2-O11	96.97(8)	O2-Tb2-O11	64.56(7)

Symmetry codes: A : -x, y-1/2, -z+1/2; B: x, y-1, z; C: -x, y+1/2, -z+1/2; D: -x, -y, -z

Table S6 Selected bond lengths (Å) and angles (°) for Dy-CP (**5**)

Dy1-O7A	2.267(3)	Dy1-O2	2.348(3)
Dy1-O11	2.347(3)	Dy1-O4B	2.379(3)
Dy1-O8C	2.389(3)	Dy1-O14D	2.414(3)
Dy1-O13D	2.460(3)	Dy1-O9C	2.490(3)
Dy2-O18	2.297(4)	Dy2-O3B	2.303(3)
Dy2-O6	2.344(3)	Dy2-O12	2.413(3)
Dy2-O17	2.416(3)	Dy2-O16	2.425(3)
Dy2-O1	2.465(3)	Dy2-O2	2.580(3)
Dy2-O11	2.743(3)		

O7A-Dy1-O2	74.80(11)	O7A-Dy1-O11	141.30(10)
O2-Dy1-O11	74.45(10)	O7A-Dy1-O4B	84.39(11)
O2-Dy1-O4B	102.47(10)	O11-Dy1-O4B	79.89(10)
O7A-Dy1-O8C	81.11(9)	O2-Dy1-O8C	93.70(10)
O11-Dy1-O8C	123.74(9)	O4B-Dy1-O8C	154.63(11)
O7A-Dy1-O14D	128.81(10)	O2-Dy1-O14D	155.06(10)
O11-Dy1-O14D	86.32(10)	O4B-Dy1-O14D	89.29(11)

O8C-Dy1-O14D	83.79(11)	O7A-Dy1-O13D	75.12(10)
O2-Dy1-O13D	149.20(9)	O11-Dy1-O13D	135.60(10)
O4B-Dy1-O13D	81.02(11)	O8C-Dy1-O13D	75.21(11)
O14D-Dy1-O13D	53.73(9)	O7A-Dy1-O9C	123.96(11)
O2-Dy1-O9C	77.72(9)	O11-Dy1-O9C	70.72(9)
O4B-Dy1-O9C	149.51(9)	O8C-Dy1-O9C	53.05(9)
O14D-Dy1-O9C	81.07(12)	O13D-Dy1-O9C	114.62(10)
O18-Dy2-O3B	150.88(12)	O18-Dy2-O6	72.81(12)
O3B-Dy2-O6	78.12(12)	O18-Dy2-O12	81.92(11)
O3B-Dy2-O12	122.09(11)	O6-Dy2-O12	136.74(10)
O18-Dy2-O17	84.77(14)	O3B-Dy2-O17	89.10(14)
O6-Dy2-O17	74.31(11)	O12-Dy2-O17	68.82(11)
O18-Dy2-O16	90.56(13)	O3B-Dy2-O16	79.52(12)
O6-Dy2-O16	73.58(10)	O12-Dy2-O16	142.30(10)
O17-Dy2-O16	147.49(11)	O18-Dy2-O1	73.20(12)
O3B-Dy2-O1	126.74(11)	O6-Dy2-O1	128.99(12)
O12-Dy2-O1	72.56(10)	O17-Dy2-O1	137.68(12)
O16-Dy2-O1	69.90(10)	O18-Dy2-O2	124.80(11)
O3B-Dy2-O2	78.34(11)	O6-Dy2-O2	141.41(10)
O12-Dy2-O2	81.84(10)	O17-Dy2-O2	135.14(10)
O16-Dy2-O2	72.38(10)	O1-Dy2-O2	51.61(9)
O18-Dy2-O11	131.11(10)	O3B-Dy2-O11	72.28(10)
O3C-Dy2-O11	133.87(11)	O12-Dy2-O11	50.17(10)
O17-Dy2-O11	70.74(11)	O16-Dy2-O11	131.89(10)
O1-Dy2-O11	97.12(10)	O2-Dy2-O11	64.40(8)

Symmetry codes: A : -x, y-1/2, -z+1/2; B: x, y-1, z; C: -x, y+1/2, -z+1/2; D: -x, -y, -z

Table S7 Selected bond lengths (Å) and angles (°) for Ho-CP (**6**)

Ho1-O7A	2.254(2)	Ho1-O2	2.334(2)
Ho1-O11	2.334(2)	Ho1-O4B	2.362(3)

Ho1-O8C	2.373(3)	Ho1-O14D	2.397(2)
Ho1-O13D	2.444(3)	Ho1-O9C	2.482(3)
Ho2-O18	2.286(3)	Ho2-O3B	2.287(3)
Ho2-O6	2.333(3)	Ho2-O12	2.392(2)
Ho2-O17	2.399(3)	Ho2-O16	2.402(3)
Ho2-O1	2.444(3)	Ho2-O2	2.557(2)
Ho2-O11	2.744(3)		

O7A-Ho1-O2	74.81(9)	O7A-Ho1-O11	141.30(9)
O2-Ho1-O11	74.56(9)	O7A-Ho1-O4B	84.36(9)
O2-Ho1-O4B	101.87(9)	O11-Ho1-O4B	79.39(9)
O7A-Ho1-O8C	80.92(9)	O2-Ho1-O8C	94.13(9)
O11-Ho1-O8C	124.32(8)	O4B-Ho1-O8C	154.60(9)
O7A-Ho1-O14D	129.11(9)	O2-Ho1-O14D	154.85(8)
O11-Ho1-O14D	85.88(9)	O4B-Ho1-O14D	89.60(10)
O8C-Ho1-O14D	83.85(10)	O7A-Ho1-O13D	75.14(9)
O2-Ho1-O13D	149.36(8)	O11-Ho1-O13D	135.14(9)
O4B-Ho1-O13D	80.96(9)	O8C-Ho1-O13D	75.33(9)
O14D-Ho1-O13D	54.03(8)	O7A-Ho1-O9C	123.44(9)
O2-Ho1-O9C	77.31(9)	O11-Ho1-O9C	71.15(9)
O4B-Ho1-O9C	149.71(9)	O8C-Ho1-O9C	53.24(8)
O14D-Ho1-O9C	81.54(10)	O13D-Ho1-O9C	115.34(9)
O18-Ho2-O3B	150.79(10)	O18-Ho2-O6	72.57(10)
O3B-Ho2-O6	78.25(10)	O18-Ho2-O12	81.76(10)
O3B-Ho2-O12	122.12(9)	O6-Ho2-O12	136.70(9)
O18-Ho2-O17	85.10(12)	O3B-Ho2-O17	88.47(12)
O6-Ho2-O17	74.58(10)	O12-Ho2-O17	68.91(11)
O18-Ho2-O16	91.15(11)	O3B-Ho2-O16	79.22(10)
O6-Ho2-O16	73.51(10)	O12-Ho2-O16	142.46(10)

O17-Ho2-O16	147.50(11)	O18-Ho2-O1	73.36(10)
O3B-Ho2-O1	126.83(10)	O6-Ho2-O1	128.66(10)
O12-Ho2-O1	72.67(9)	O17-Ho2-O1	138.10(11)
O16-Ho2-O1	69.99(9)	O18-Ho2-O2	125.13(9)
O3B-Ho2-O2	78.37(10)	O6-Ho2-O2	141.54(8)
O12-Ho2-O2	81.75(9)	O17-Ho2-O2	134.52(10)
O16-Ho2-O2	72.42(9)	O1-Ho2-O2	51.77(8)
O18-Ho2-O11	130.91(9)	O3B-Ho2-O11	72.25(8)
O6-Ho2-O11	133.95(9)	O12-Ho2-O11	50.19(8)
O17-Ho2-O11	70.15(9)	O16-Ho2-O11	131.77(8)
O1-Ho2-O11	97.38(8)	O2-Ho2-O11	64.38(7)

Symmetry codes: A : -x, y-1/2, -z+1/2; B: x, y-1, z; C: -x, y+1/2, -z+1/2; D: -x, -y, -z.

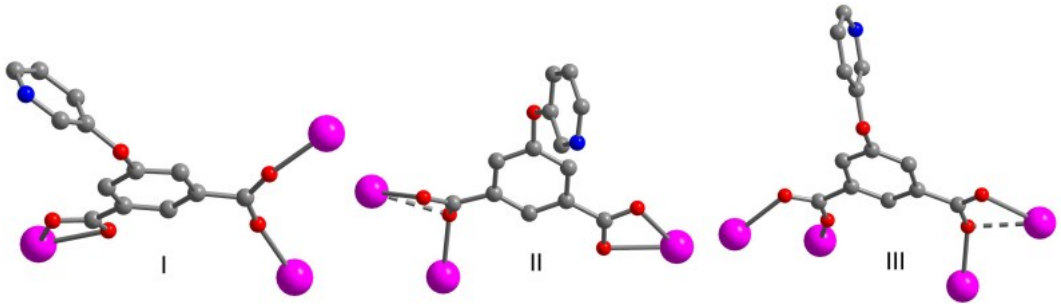

Fig. S1 The coordination modes of L ligand.

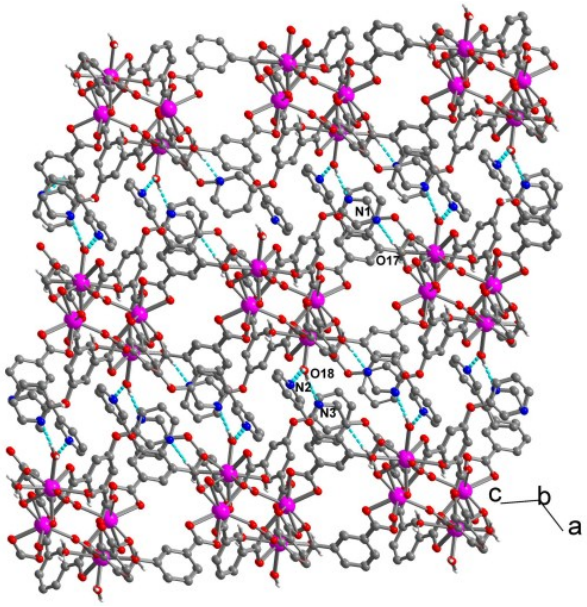

Fig. S2 The 3D packing of the layers in Eu-CP (**2**) through hydrogen bonding interactions.

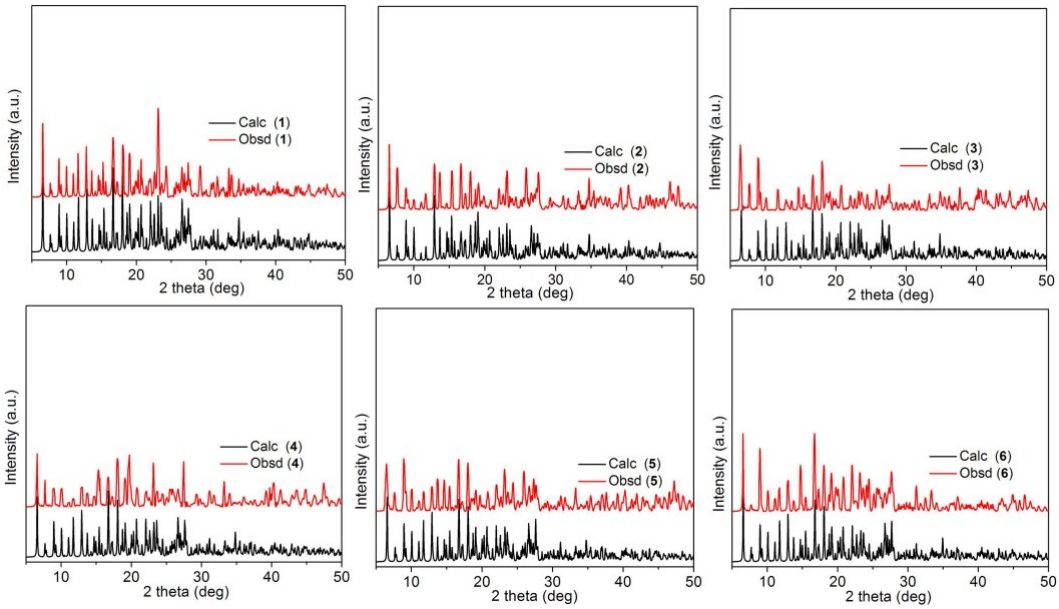

Fig. S3 PXRD patterns of CPs **1-6**.

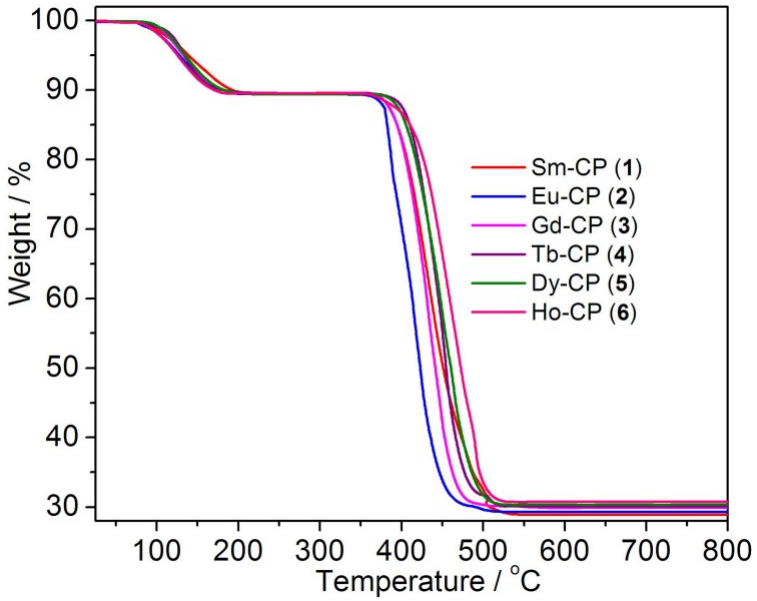

Fig. S4 TGA Plots of CPs **1-6**.

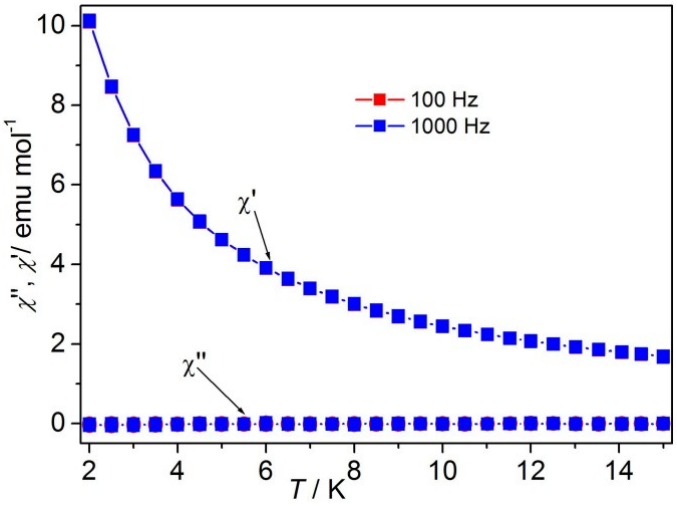

Fig. S5 The ac susceptibilities of Ho-CP (**6**) measured at 2 K under H*dc* = 0 fields.

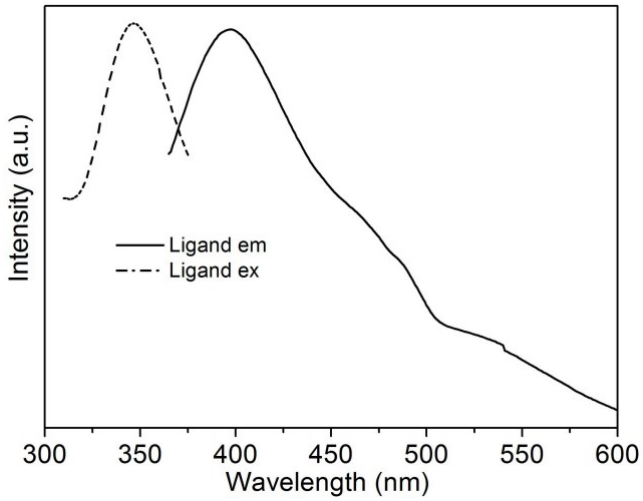

Fig. S6 Solid state emission and excitation spectra of the L ligand at 298 K.

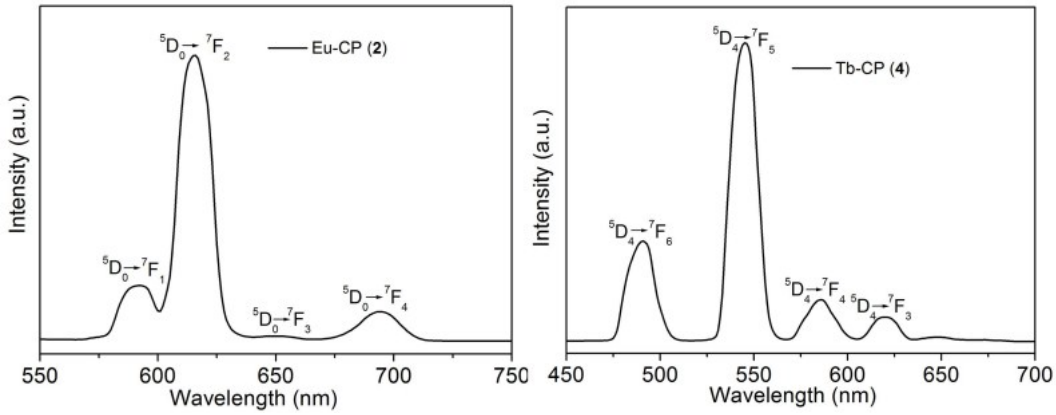

Fig. S7 Solid sample emission spectra of Eu-CP (**2**) and Tb-CP (**4**) under room temperature.

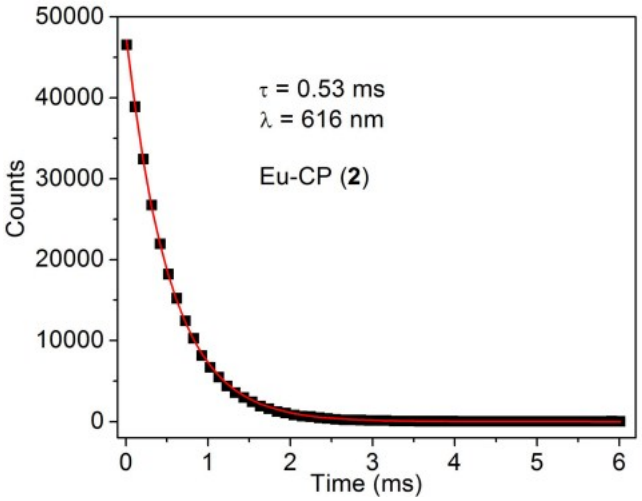

Fig. S8 Decay time of Eu-CP (**2**).

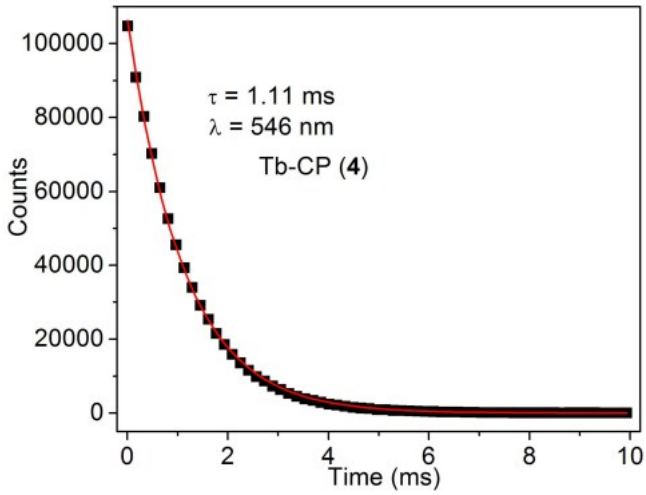

Fig. S9 Decay time of Tb-CP (**4**).

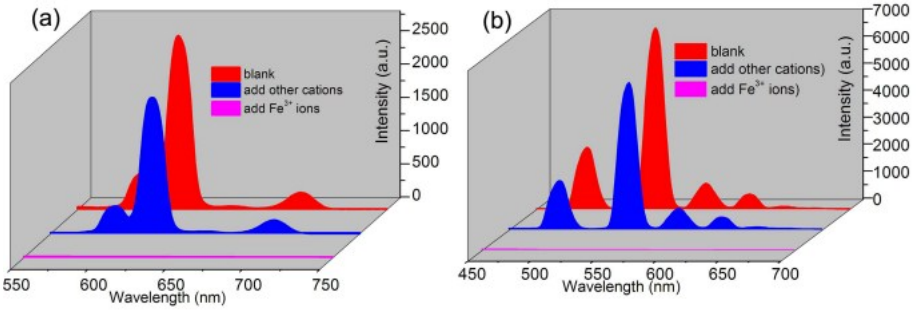

Fig. S10 Luminescence spectra of Eu-CP (**2**) (a) and Tb-CP (**4**) (b) dispersed in aqueous solution in the presence of a mixture of other metal cations (K^+, Li^+, Mg^{2+}, Na^+, Al^{3+}, Cr^{3+}, Mg^{2+}, Zn^{2+}, Ag^+, Cd^{2+}, Ni^{2+}, Cu^{2+}, Hg^{2+}, Fe^{2+}) and a mixture of other metal cations with Fe^{3+} ions. The concentration and volume for both Fe^{3+} and the interfering cations were1 mM and 3 mL.

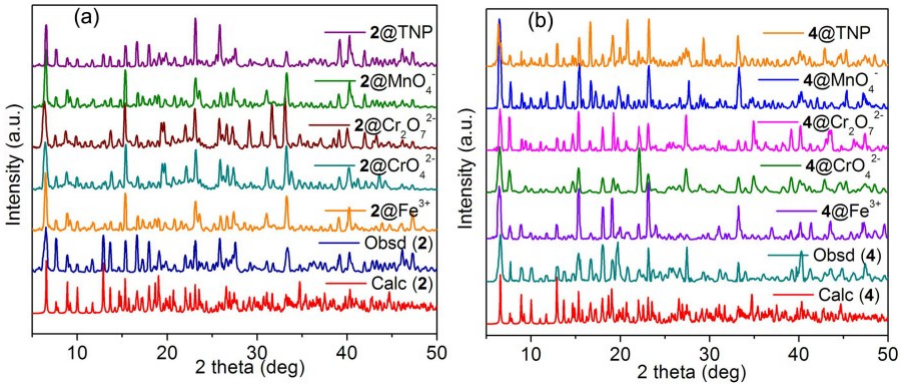

Fig. S11 The PXRD data of the as-synthesized Eu-CP (**2**) (a) and Tb-CP (**4**) (b) after Fe^{3+}, MO_4^-, CrO_4^{2-}, $Cr_2O_7^{2-}$ and TNP sensing process, with the simulated result as reference.

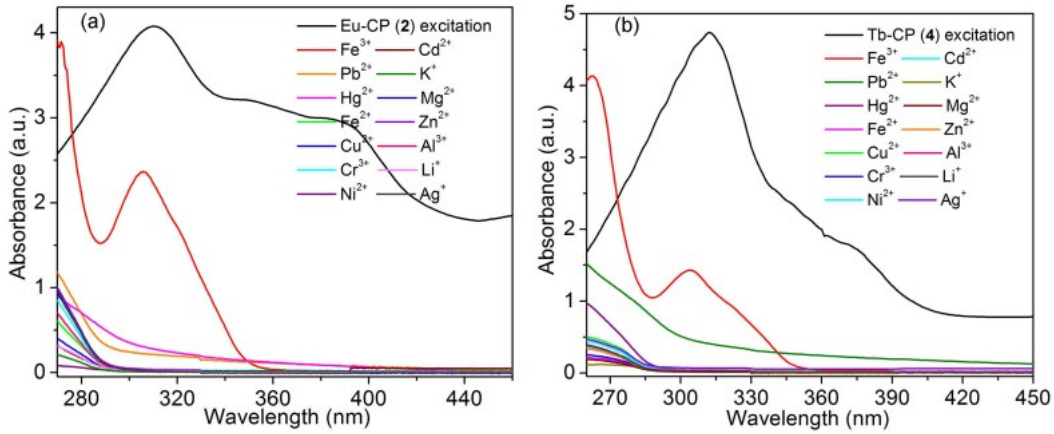

Fig. S12 UV-vis spectra of Eu-CP (**2**) (a) and Tb-CP (**4**) (b) containing different cations (1 mM) and corresponding excitation spectrum.

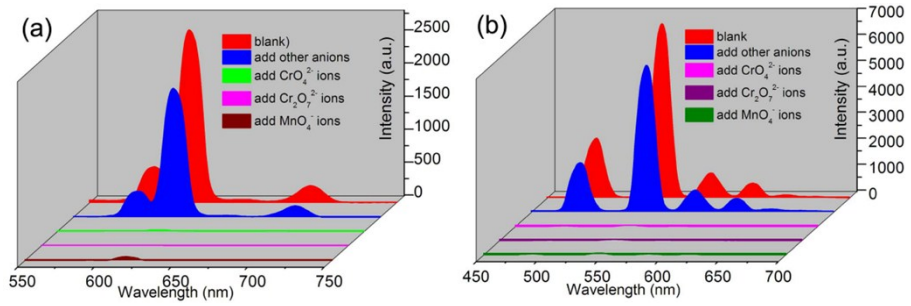

Fig. S13 Luminescence spectra of Eu-CP (**2**) (a) and Tb-CP (**4**) (b) dispersed in aqueous solution in the presence of a mixture of other anions (IO_3^-, SO_4^{2-}, I^-, NO_3^-, ClO_3^-, Cl^-, CO_3^{2-}, Br^-)) and a mixture of other anions with CrO_4^{2-}, $Cr_2O_7^{2-}$ or MnO_4^- ions. The concentration and volume for both CrO_4^{2-}/$Cr_2O_7^{2-}$/MnO_4^- and the interfering cations were1 mM and 3 mL.

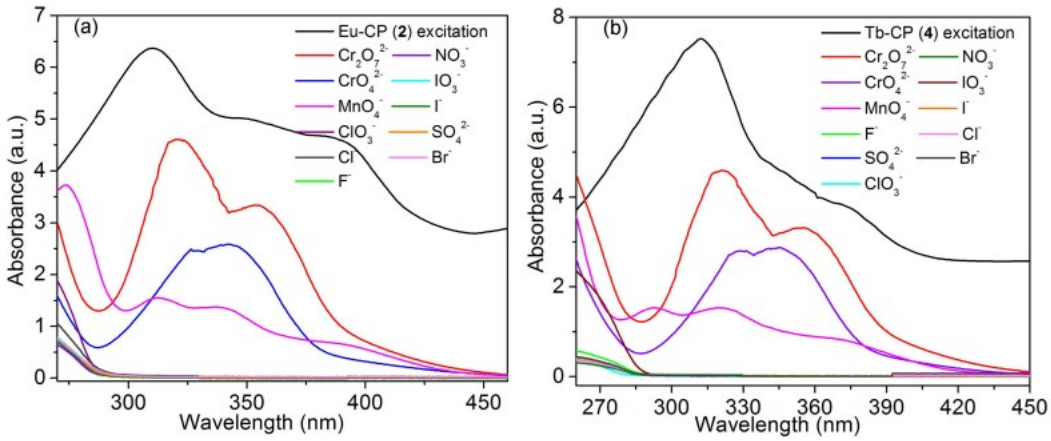

Fig. S14 UV-vis spectra of Eu-CP (**2**) (a) and Tb-CP (**4**) (b) containing different anions (1 mM) and corresponding excitation spectrum.

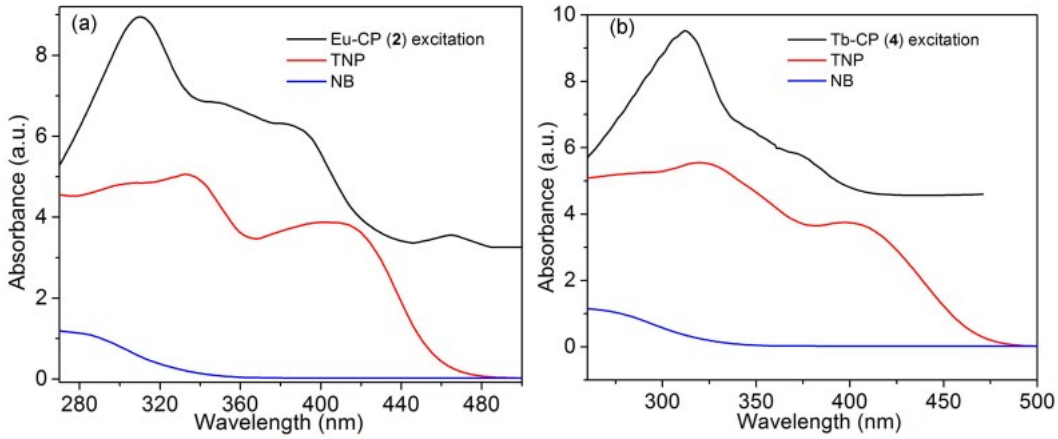

Fig. S15 UV-vis spectra of Eu-CP (**2**) (a) and Tb-CP (**4**) (b) containing different anions (1 mM) and corresponding excitation spectrum.