Electronic supplementary information (ESI)

A series of silver(I)-lanthanide(III) heterometallic coordination polymers: syntheses, structures and photoluminescent properties

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Table S1. Selected bond lengths (Å) and angles (deg) for complexes **1** - **8**.[a]

Complex **1**			
Nd(1)–O(3)#1	2.329(4)	Nd(1)–O(10)	2.422(4)
Nd(1)–O(6)	2.498(4)	Nd(1)–O(1)	2.506(4)
Nd(1)–O(2)	2.528(4)	Nd(1)–O(5)	2.548(4)
Nd(1)–O(9)	2.556(4)	Nd(1)–O(12)	2.587(4)
Nd(1)–O(11)	2.636(4)	Ag(1)–N(5)#2	2.164(4)
Ag(1)–N(3)	2.171(4)	Ag(1)–N(6)#3	2.318(4)
O(3)#1–Nd(1)–O(10)	80.73(19)	O(3)#1–Nd(1)–O(6)	140.78(14)
O(10)–Nd(1)–O(6)	77.95(18)	O(3)#1–Nd(1)–O(1)	71.75(13)
O(10)–Nd(1)–O(1)	152.34(19)	O(6)–Nd(1)–O(1)	126.01(12)
O(3)#1–Nd(1)–O(2)	118.24(13)	O(10)–Nd(1)–O(2)	148.92(16)
O(6)–Nd(1)–O(2)	96.22(13)	O(1)–Nd(1)–O(2)	51.71(12)
O(3)#1–Nd(1)–O(5)	121.20(14)	O(10)–Nd(1)–O(5)	123.26(16)

O(6)–Nd(1)–O(5)	51.42(11)	O(1)–Nd(1)–O(5)	75.43(12)
O(2)–Nd(1)–O(5)	70.12(13)	O(3)#1–Nd(1)–O(9)	136.94(15)
O(10)–Nd(1)–O(9)	81.66(18)	O(6)–Nd(1)–O(9)	71.33(14)
O(1)–Nd(1)–O(9)	116.90(13)	O(2)–Nd(1)–O(9)	67.69(13)
O(5)–Nd(1)–O(9)	101.28(14)	O(3)#1–Nd(1)–O(12)	69.16(14)
O(10)–Nd(1)–O(12)	75.15(15)	O(6)–Nd(1)–O(12)	73.72(13)
O(1)–Nd(1)–O(12)	97.01(13)	O(2)–Nd(1)–O(12)	133.03(13)
O(5)–Nd(1)–O(12)	68.14(14)	O(9)–Nd(1)–O(12)	141.25(13)
O(3)#1–Nd(1)–O(11)	69.76(14)	O(10)–Nd(1)–O(11)	77.05(15)
O(6)–Nd(1)–O(11)	134.71(13)	O(1)–Nd(1)–O(11)	90.61(13)
O(2)–Nd(1)–O(11)	86.55(13)	O(5)–Nd(1)–O(11)	156.67(14)
O(9)–Nd(1)–O(11)	68.13(13)	O(12)–Nd(1)–O(11)	133.20(13)
N(5)#2–Ag(1)–N(3)	144.18(17)	N(5)#2–Ag(1)–N(6)#3	114.00(16)
N(3)–Ag(1)–N(6)#3	101.74(16)		

Complex **2**

Eu(1)–O(3)#1	2.311(2)	Eu(1)–O(10)	2.381(2)
Eu(1)–O(6)	2.475(2)	Eu(1)–O(1)	2.484(2)
Eu(1)–O(2)	2.489(2)	Eu(1)–O(5)	2.510(2)
Eu(1)–O(9)	2.528(3)	Eu(1)–O(12)	2.555(2)
Eu(1)–O(11)	2.592(2)	Ag(1)–N(113)	2.162(3)
Ag(1)–N(12)#2	2.165(2)	Ag(1)–N(112)#3	2.327(3)
O(3)#1–Eu(1)–O(10)	80.54(11)	O(3)#1–Eu(1)–O(6)	140.24(8)
O(10)–Eu(1)–O(6)	77.45(10)	O(3)#1–Eu(1)–O(1)	71.05(8)
O(10)–Eu(1)–O(1)	151.46(10)	O(6)–Eu(1)–O(1)	127.11(7)
O(3)#1–Eu(1)–O(2)	118.06(8)	O(10)–Eu(1)–O(2)	148.45(9)
O(6)–Eu(1)–O(2)	97.33(8)	O(1)–Eu(1)–O(2)	52.56(7)
O(3)#1–Eu(1)–O(5)	121.36(8)	O(10)–Eu(1)–O(5)	124.10(9)
O(6)–Eu(1)–O(5)	52.37(7)	O(1)–Eu(1)–O(5)	75.31(7)
O(2)–Eu(1)–O(5)	70.13(7)	O(3)#1–Eu(1)–O(9)	137.46(8)
O(10)–Eu(1)–O(9)	81.64(10)	O(6)–Eu(1)–O(9)	70.85(8)
O(1)–Eu(1)–O(9)	117.77(8)	O(2)–Eu(1)–O(9)	67.45(8)
O(5)–Eu(1)–O(9)	100.58(8)	O(3)#1–Eu(1)–O(12)	69.27(8)
O(10)–Eu(1)–O(12)	75.33(9)	O(6)–Eu(1)–O(12)	73.31(8)

O(1)–Eu(1)–O(12)	96.55(8)	O(2)–Eu(1)–O(12)	133.57(7)
O(5)–Eu(1)–O(12)	68.59(8)	O(9)–Eu(1)–O(12)	140.70(8)
O(3)#1–Eu(1)–O(11)	69.90(8)	O(10)–Eu(1)–O(11)	77.73(9)
O(6)–Eu(1)–O(11)	134.88(8)	O(1)–Eu(1)–O(11)	89.72(8)
O(2)–Eu(1)–O(11)	85.05(7)	O(5)–Eu(1)–O(11)	155.19(7)
O(9)–Eu(1)–O(11)	68.70(8)	O(12)–Eu(1)–O(11)	133.89(7)
N(113)–Ag(1)–N(12)#2	144.15(10)	N(113)–Ag(1)–N(112)#3	113.84(9)
N(12)#2–Ag(1)–N(112)#3	101.94(10)		

Complex **3**

Tb(1)–O(3)#1	2.284(2)	Tb(1)–O(10)	2.350(2)
Tb(1)–O(6)	2.445(2)	Tb(1)–O(1)	2.457(2)
Tb(1)–O(2)	2.465(2)	Tb(1)–O(5)	2.477(2)
Tb(1)–O(12)	2.506(2)	Tb(1)–O(9)	2.524(2)
Tb(1)–O(11)	2.545(2)	Ag(1)–N(113)#2	2.153(2)
Ag(1)–N(12)	2.153(2)	Ag(1)–N(112)#3	2.319(2)
O(3)#1–Tb(1)–O(10)	80.36(10)	O(3)#1–Tb(1)–O(6)	140.52(7)
O(10)–Tb(1)–O(6)	77.45(10)	O(3)#1–Tb(1)–O(1)	71.05(7)
O(10)–Tb(1)–O(1)	151.30(9)	O(6)–Tb(1)–O(1)	127.23(7)
O(3)#1–Tb(1)–O(2)	118.12(7)	O(10)–Tb(1)–O(2)	148.02(8)
O(6)–Tb(1)–O(2)	97.36(7)	O(1)–Tb(1)–O(2)	53.03(6)
O(3)#1–Tb(1)–O(5)	121.56(7)	O(10)–Tb(1)–O(5)	124.67(9)
O(6)–Tb(1)–O(5)	52.96(7)	O(1)–Tb(1)–O(5)	74.81(7)
O(2)–Tb(1)–O(5)	70.09(7)	O(3)#1–Tb(1)–O(12)	137.34(8)
O(10)–Tb(1)–O(12)	81.51(9)	O(6)–Tb(1)–O(12)	70.37(7)
O(1)–Tb(1)–O(12)	118.18(7)	O(2)–Tb(1)–O(12)	67.23(8)
O(5)–Tb(1)–O(12)	100.48(8)	O(3)#1–Tb(1)–O(9)	69.22(8)
O(10)–Tb(1)–O(9)	75.59(8)	O(6)–Tb(1)–O(9)	73.83(7)
O(1)–Tb(1)–O(9)	96.01(7)	O(2)–Tb(1)–O(9)	133.88(7)
O(5)–Tb(1)–O(9)	68.93(8)	O(12)–Tb(1)–O(9)	140.80(7)
O(3)#1–Tb(1)–O(11)	68.92(8)	O(10)–Tb(1)–O(11)	78.02(9)
O(6)–Tb(1)–O(11)	134.59(7)	O(1)–Tb(1)–O(11)	89.64(7)
O(2)–Tb(1)–O(11)	84.23(7)	O(5)–Tb(1)–O(11)	154.32(8)
O(12)–Tb(1)–O(11)	68.65(8)	O(9)–Tb(1)–O(11)	134.21(7)

N(113)#2–Ag(1)–N(12)	144.26(8)	N(113)#2–Ag(1)–N(112)#3	113.60(9)
N(12)–Ag(1)–N(112)#3	102.07(9)		
Complex **4**			
Nd(1)–O(4)#1	2.351(3)	Nd(1)–O(1)#2	2.537(3)
Nd(1)–O(3)	2.394(3)	Nd(1)–O(2)#2	2.527(3)
Ag(1)–N(2)	2.120(3)		
O(2)#2–Nd(1)–O(1)#2	51.21(10)	O(2)#2–Nd(1)–O(1)#3	78.90(13)
O(1)#3–Nd(1)–O(1)#2	78.60(19)	O(2)#2–Nd(1)–O(2)#3	116.11(15)
O(3)–Nd(1)–O(1)#2	74.98(10)	O(3)–Nd(1)–O(1)#3	121.78(10)
O(3)–Nd(1)–O(2)#2	118.22(11)	O(3)–Nd(1)–O(2)#3	73.15(11)
O(3)–Nd(1)–O(3)#4	160.09(14)	O(4)#1–Nd(1)–O(1)#2	101.67(13)
O(4)#1–Nd(1)–O(1)#3	158.60(11)	O(4)#1–Nd(1)–O(2)#2	84.69(11)
O(4)#1–Nd(1)–O(2)#3	150.16(10)	O(4)#1–Nd(1)–O(3)	78.18(10)
O(4)#1–Nd(1)–O(4)#5	85.85(17)	O(4)#5–Nd(1)–O(3)	87.23(10)
N(2)#6–Ag(1)–N(2)	160.3(2)		
Complex **5**			
Eu(1)–O(2)	2.4931(17)	Eu(1)–O(1)	2.4925(18)
Eu(1)–O(4)#1	2.3131(16)	Eu(1)–O(3)#2	2.3578(16)
Ag(1)–N(2)	2.108(2)		
O(1)–Eu(1)–O(2)	52.28(6)	O(4)#1–Eu(1)–O(1)	83.28(7)
O(4)#1–Eu(1)–O(2)	101.88(7)	O(4)#1–Eu(1)–O(4)#3	86.79(10)
O(3)#2–Eu(1)–O(1)	118.26(6)	O(4)#3–Eu(1)–O(1)	150.69(6)
O(3)#2–Eu(1)–O(3)#4	159.18(7)	O(4)#3–Eu(1)–O(2)	157.01(6)
O(4)#1–Eu(1)–O(3)#2	78.51(6)	O(3)#4–Eu(1)–O(2)	122.85(5)
O(3)#2–Eu(1)–O(2)	74.79(6)	O(1)–Eu(1)–O(1)#5	117.41(9)
O(4)#1–Eu(1)–O(3)#4	86.36(6)	O(2)#5–Eu(1)–O(2)	78.37(10)
O(3)#4–Eu(1)–O(1)	73.40(6)	O(1)–Eu(1)–O(2)#5	78.85(7)
N(2)#6–Ag(1)–N(2)	160.89(11)		
Complex **6**			
Tb(1)–O(2)	2.4744(19)	Tb(1)–O(1)	2.4653(19)
Tb(1)–O(4)#1	2.2864(17)	Tb(1)–O(3)#2	2.3292(18)
Ag(2)–N(12)	2.105(2)		
O(1)–Tb(1)–O(2)	52.62(7)	O(4)#1–Tb(1)–O(1)	83.08(7)

O(4)#1–Tb(1)–O(2)	102.28(8)	O(4)#1–Tb(1)–O(4)#3	86.59(10)
O(4)#1–Tb(1)–O(3)#2	85.81(6)	O(3)#2–Tb(1)–O(2)	123.21(6)
O(3)#2–Tb(1)–O(1)	73.46(7)	O(4)#3–Tb(1)–O(1)	150.96(6)
O(4)#3–Tb(1)–O(2)	156.41(6)	O(3)#4–Tb(1)–O(2)	74.77(6)
O(3)#2–Tb(1)–O(3)#4	158.82(8)	O(3)#4–Tb(1)–O(1)	118.36(7)
O(4)#1–Tb(1)–O(3)#4	78.79(6)	O(1)–Tb(1)–O(2)#5	78.68(8)
O(2)#5–Tb(1)–O(2)	78.27(11)	O(1)#5–Tb(1)–O(1)	117.62(10)
O(3)#4–Tb(1)–O(2)#5	123.22(6)	N(12)–Ag(2)–N(12)#6	161.13(12)
O(4)#3–Tb(1)–O(3)#4	85.82(6)		
Complex **7**			
Er(1)–O(5)#1	2.2138(19)	Er(1)–O(7)	2.341(2)
Er(1)–O(9)	2.363(2)	Er(1)–O(4)#2	2.3618(17)
Er(1)–O(2)	2.3910(19)	Er(1)–O(1)	2.404(2)
Er(1)–O(8)	2.4081(19)	Er(1)–O(3)#2	2.4378(19)
Ag(1)–N(12)	2.194(2)	Ag(1)–N(112)#3	2.175(2)
Ag(1)–N(113)#4	2.436(2)		
O(7)–Er(1)–O(1)	124.33(7)	O(9)–Er(1)–O(8)	153.17(7)
O(7)–Er(1)–O(4)#2	124.65(7)	O(4)#2–Er(1)–O(2)	126.90(6)
O(1)–Er(1)–O(3)#2	126.75(6)	O(5)#1–Er(1)–O(1)	134.94(7)
O(5)#1–Er(1)–O(8)	128.95(7)	O(4)#2–Er(1)–O(3)#2	54.44(6)
O(5)#1–Er(1)–O(4)#2	135.10(7)	O(7)–Er(1)–O(8)	54.78(6)
O(7)–Er(1)–O(9)	151.98(7)	O(5)#1–Er(1)–O(7)	74.23(7)
O(2)–Er(1)–O(3)#2	175.70(6)	O(9)–Er(1)–O(4)#2	76.75(7)
O(2)–Er(1)–O(1)	54.57(6)	O(1)–Er(1)–O(8)	80.49(7)
O(4)#2–Er(1)–O(1)	72.38(6)	O(2)–Er(1)–O(8)	86.15(7)
O(9)–Er(1)–O(1)	76.69(8)	O(7)–Er(1)–O(2)	87.94(7)
O(5)#1–Er(1)–O(9)	77.75(7)	O(8)–Er(1)–O(3)#2	90.07(7)
O(4)#2–Er(1)–O(8)	83.07(6)	O(5)#1–Er(1)–O(3)#2	90.66(7)
O(7)–Er(1)–O(3)#2	88.21(7)	O(9)–Er(1)–O(3)#2	92.37(7)
O(5)#1–Er(1)–O(2)	90.15(7)	O(9)–Er(1)–O(2)	91.96(7)
N(112)#3–Ag(1)–N(12)	140.91(8)	N(12)–Ag(1)–N(113)#4	86.69(8)
N(112)#3–Ag(1)–N(113)#4	121.85(8)		
Complex **8**			

Yb(1)–O(1)	2.321(2)	Yb(1)–O(3)#1	2.189(2)
Yb(1)–O(9)	2.331(2)	Yb(1)–O(8)#2	2.341(2)
Yb(1)–O(5)	2.374(2)	Yb(1)–O(2)	2.383(2)
Yb(1)–O(6)	2.385(2)	Yb(1)–O(7)#2	2.426(2)
Ag(1)–N(12)	2.174(2)	Ag(1)–N(112)#3	2.194(3)
Ag(1)–N(13)#4	2.429(3)		
O(1)–Yb(1)–O(9)	151.65(8)	O(9)–Yb(1)–O(6)	76.76(9)
O(8)#2–Yb(1)–O(7)#2	54.74(7)	O(5)–Yb(1)–O(7)#2	175.29(7)
O(9)–Yb(1)–O(2)	152.94(8)	O(1)–Yb(1)–O(2)	55.36(7)
O(5)–Yb(1)–O(6)	54.96(7)	O(3)#1–Yb(1)–O(1)	73.80(8)
O(8)#2–Yb(1)–O(6)	72.45(7)	O(2)–Yb(1)–O(6)	80.30(8)
O(9)–Yb(1)–O(8)#2	76.70(8)	O(5)–Yb(1)–O(2)	86.02(8)
O(3)#1–Yb(1)–O(9)	77.85(9)	O(1)–Yb(1)–O(5)	87.57(8)
O(8)#2–Yb(1)–O(2)	82.88(7)	O(3)#1–Yb(1)–O(5)	89.66(8)
O(1)–Yb(1)–O(7)#2	87.96(8)	O(3)#1–Yb(1)–O(7)#2	90.52(8)
O(2)–Yb(1)–O(7)#2	90.21(7)	O(9)–Yb(1)–O(5)	92.36(8)
O(9)–Yb(1)–O(7)#2	92.28(8)	O(3)#1–Yb(1)–O(6)	134.79(8)
O(3)#1–Yb1–(O8)#2	135.30(8)	O(8)#2–Yb(1)–O(5)	127.36(7)
O(3)#1–Yb(1)–O(2)	129.09(8)	O(1)–Yb(1)–O(8)#2	124.80(8)
O(6)–Yb(1)–O(7)#2	127.13(7)	O(1)–Yb(1)–O(6)	124.59(8)
N(12)–Ag(1)–N(112)#3	140.42(10)	N12–Ag1–N13#4	121.90(9)
N(112)#3–Ag(1)–N(13)#4	86.99(9)		

[a] Symmetry transformations used to generate equivalent atoms: #1 $-x, -y + 1, -z + 2$; #2 $x + 1, y, z + 1$; #3 $-x + 2, -y + 2, -z + 1$ for **1**; #1 $-x, -y, -z + 2$; #2 $x - 1, y, z - 1$; #3 $-x + 1, -y + 1, -z$ for **2**; #1 $-x + 2, -y + 2, -z + 1$; #2 $x - 1, y, z - 1$; #3 $-x, -y + 1, -z + 2$ for **3**; #1 $x, -y + 1, z - 1/2$; #2 $x + 1/2, -y + 1/2, -z$; #3 $x - 1/2, -y + 1/2, z - 1/2$; #4 $-x, y, -z - 1/2$; #5 $-x, -y + 1, -z$; #6 $-x + 1, y, -z + 5/2$ for **4**; #1 $-x + 1/2, y + 1/2, -z + 1/2$; #2 $-x + 1/2, -y + 3/2, -z$; #3 $x + 1/2, y + 1/2, z$; #4 $x + 1/2, -y + 3/2, z + 1/2$; #5 $-x + 1, y, -z + 1/2$; #6 $-x + 1, y, -z + 5/2$ for **5**; #1 $-x + 1/2, y + 1/2, -z + 1/2$; #2 $x + 1/2, -y + 1/2, z + 1/2$; #3 $x + 1/2, y + 1/2, z$; #4 $-x + 1/2, -y + 1/2, -z$; #5 $-x + 1, y, -z + 1/2$; #6 $-x + 1, y, -z + 5/2$ for **6**; #1 $-x + 1, -y + 1, -z$; #2 $x, y + 1, z$; #3 $-x - 1, -y, -z + 1$; #4 $x + 1, y, z + 1$ for **7**; #1 $-x, -y, -z + 1$; #2 $x, y - 1, z$; #3 $-x + 2, -y + 1, -z$; #4 $-x + 3, -y + 1, -z + 1$ for **8**.

Table S2. Hydrogen bonding data for complexes **1 - 3**, **7** and **8**. [a]

D-H···A	d(D···A) (Å)	∠D–H···A (°)
Complex **1**		
O(9)–H(9A)···O(6)#1	2.827(6)	173
O(9)–H(9B)···O(4)#2	2.834(6)	173
O(10)–H(10A)···O(8)#3	2.561(6)	155
O(11)–H(11A)···O(7)#3	2.799(6)	170
O(11)–H(11B)···O(4)#2	2.908(6)	170
O(12)–H(12A)···O(8)#4	2.823(6)	178
O(12)–H(12B)···O(2)#5	2.873(6)	178
O(10)–H(10B)···O(4)#6	3.386(7)	155
O(10)–H(10C)···O(10)#7	2.916(8)	174
Complex **2**		
O(9)–H(11)···O(6)#1	2.839(4)	172
O(9)–H(12)···O(4)#2	2.827(4)	154
O(10)–H(13)···O(8)#3	2.565(3)	168
O(11)–H(15)···O(7)#3	2.803(4)	176
O(11)–H(16)···O(4)#2	2.876(4)	157
O(12)–H(17)···O(8)#4	2.824(4)	179
O(12)–H(18)···O(2)#5	2.917(4)	162
O(10)–H(14)···O(10)#6	2.935(4)	173
Complex **3**		
O(9)–H(11)···O(2)#1	2.924(3)	171
O(9)–H(12)···O(8)#2	2.823(3)	173
O(10)–H(13)···O(8)#3	2.561(3)	175
O(10)–H(14)···O(10)#4	2.925(4)	172
O(11)–H(15)···O(4)#5	2.880(3)	161
O(11)–H(16)···O(7)#3	2.804(3)	170
O(12)–H(17)···O(4)#5	2.828(3)	153
O(10)–H(14B)···O(4)#6	3.335(4)	159
O(12)–H(18)···O(6)#7	2.848(3)	155
Complex **7**		
O(9)–H(11)···O(10)	2.700(4)	164

O(9)–H(12)···O(1)#1	2.971(3)	171
O(10)–H(13)···O(4)#2	2.828(3)	134
O(10)–H(14)···O(8)#3	3.039(3)	162
Complex **8**		
O(9)–H(11)···O(10)#1	2.692(4)	165
O(9)–H(12)···O(6)#2	2.999(3)	156
O(10)–H(13)···O(8)#3	2.827(4)	130
O(10)–H(14)···O(2)	3.042(4)	153

[a] Symmetry transformations used to generate equivalent atoms: #1 $-x + 1, -y + 1, -z + 1$; #2 $-x + 1, -y + 1, -z + 2$; #3 $x, y - 1, z$; #4 $-x, -y + 2, -z + 1$; #5 $x - 1, y, z$; #6 $-x, -y + 1, -z + 2$; #7 $-x, -y + 1, -z + 1$ for **1**; #1 $-x + 1, -y, -z + 1$; #2 $-x + 1, -y, -z + 2$; #3 $x, y - 1, z$; #4 $-x, -y + 1, -z + 1$; #5 $x - 1, y, z$; #6 $-x, -y, -z + 1$ for **2**; #1 $x + 1, y, z$; #2 $-x + 2, -y + 1, -z + 2$; #3 $x, y + 1, z$; #4 $-x + 2, -y + 2, -z + 2$; #5 $-x + 1, -y + 2, -z + 1$; #6 $-x + 2, -y + 2, -z + 1$; #7 $-x + 1, -y + 2, -z + 2$ for **3**; #1 $-x + 1, -y + 1, -z + 1$; #2 $x + 1, y + 1, z$; #3 $x + 1, y, z$ for **7**; #1 $x - 1, y, z$; #2 $-x, -y, -z$; #3 $x, y - 1, z$ for **8**.

Table S3. Ag···π interactions data for complexes **1 - 8**. [a,b]

Ring···Ag	d(Ag ··· Cg) (Å)
Complex **1**	
N1–C7–N2–N3–C8···Ag1#1	3.52
C1–C2–C3–C4–C5–C6···Ag1#2	3.34
Complex **2**	
N11–C11–N12–N13–C12···Ag1#1	3.50
C1–C2–C3–C4–C5–C6···Ag1#2	3.33
Complex **3**	
N11–C11–N12–N13–C12···Ag1#1	3.48
C1–C2–C3–C4–C5–C6···Ag1#2	3.31
Complex **4**	
C1–C2–C3–C4–C5–C6···Ag1#1	3.92
Complex **5**	
C1–C2–C3–C4–C5–C6···Ag1#1	3.90

Complex **6**	
C1–C2–C3–C4–C5–C6···Ag2#1	3.89
Complex **7**	
C101–C102–C103–C104–C105–C106···Ag1#1	3.31
Complex **8**	
C1–C2–C3–C4–C5–C6···Ag1#1	3.29

[a] Symmetry transformations used to generate equivalent atoms: #1 $-x + 2, -y + 2, -z + 2$; #2 $x - 1, y, z$ for **1**; #1 $-x + 1, -y + 1, -z + 1$; #2 $x, y, z + 1$ for **2**; #1 $-x, -y + 1, -z + 1$; #2 $x + 1, y, z$ for **3**; #1 $x, y, z - 1$ for **4**; #1 $x, y, z - 1$ for **5**; #1 $x, y, z - 1$ for **6**; #1 $x, y, z - 1$ for **7**; #1 $-x + 2, -y + 1, -z + 1$ for **8**.

[b] Cg refers to the centroid of the ring.

Table S4. π···π interactions data for complexes **1** - **3**, **7** and **8**. [a,b]

Complex **1**			
Ring 1	N1–C7–N2–N3–C8	Ring 2	N4–C17–N5–N6–C18
Ring 3	C1–C2–C3–C4–C5–C6	Ring 4	C11–C12–C13–C14–C15–C16
Cg(1)···Cg(2)#1		3.634(3)	
Cg(2)···Cg(1)#1		3.633(3)	
Cg(1)···Cg(3)#2		3.923(3)	
Cg(3)···Cg(1)#3		3.924(3)	
Cg(3)···Cg(3)#4		3.742(3)	
Cg(4)···Cg(4)#5		3.561(3)	
Cg(4)···Cg(4)#1		3.770(3)	
Complex **2**			
Ring 1	N11–C11–N12–N13–C12	Ring 2	N111–C111–N112–N113–C112
Ring 3	C1–C2–C3–C4–C5–C6	Ring 4	C101–C102–C103–C104–C105–C106
Cg(1)···Cg(2)#1		3.611(2)	
Cg(2)···Cg(1)#1		3.610(2)	
Cg(1)···Cg(3)#2		3.908(3)	
Cg(3)···Cg(3)#3		3.712(2)	
Cg(4)···Cg(4)#4		3.539(2)	
Cg(4)···Cg(4)#5		3.750(2)	
Cg(3)···Cg(1)#6		3.908(3)	
Complex **3**			
Ring 1	N11–C11–N12–N13–C12	Ring 2	N111–C111–N112–C113–C112
Ring 3	C1–C2–C3–C4–C5–C6	Ring 4	C101–C102–C103–C104–C105–C106
Cg(1)···Cg(2)#1		3.587(2)	
Cg(1)···Cg(3)#2		3.897(2)	
Cg(3)···Cg(3)#3		3.683(2)	
Cg(4)···Cg(4)#1		3.735(2)	
Cg(4)···Cg(4)#4		3.528(2)	
Complex **7**			
Ring 1	N111–C111–N112–N113–C112	Ring 2	C1–C2–C3–C4–C5–C6
Ring 3	C101–C102–C103–C104–C105–C106		
Cg(1)···Cg(1)#1		3.506(2)	

Cg(2)···Cg(2)#2		3.469(2)	
Cg(3)···Cg(3)#3		3.463(2)	
Complex **8**			
Ring 1	N11–C11–N12–N13–C12	Ring 2	C1–C2–C3–C4–C5–C6
Ring 3	C101–C102–C103–C104–C105–C106		
Cg(1)···Cg(1)#1		3.491(2)	
Cg(2)···Cg(2)#2		3.451(2)	
Cg(3)···Cg(3)#3		3.466(2)	

[a] Symmetry transformations used to generate equivalent atoms: #1 –*x* +1, –*y* +2, –*z* +1; #2 *x* + 1, *y*, *z*; #3 *x* – 1, *y*, *z*; #4 –*x* + 1, –*y* + 1,–*z* + 2; #5 –*x*, –*y* + 2, –*z* + 1 for **1**; #1 –*x* + 1, –*y* + 1,–*z* + 1; #2 *x* + 1, *y*, *z*; #3 –*x* +1, –*y*, –*z* + 2; #4 –*x*, –*y* + 1, –*z* + 1; #5 –*x* + 1, –*y* + 1,–*z* + 1; #6 x – 1, y, z for **2**; #1 –*x* + 1, –*y* + 1, –*z* + 2; #2 *x* – 1, *y*, *z*; #3 –*x* + 1, –*y* + 2, –*z* + 1; #4 –*x* + 2, –*y* + 1, –*z* + 2 for **3**; #1 –*x*–1, –*y*, –*z*; #2 –*x* + 1, –*y*, –*z* + 1; #3 –*x*, –*y* + 1, –*z* for **7**; #1 –*x* + 2, –*y* + 1, –*z* + 1; #2 –*x* + 1, –*y*, –*z* + 1; #3 –*x*, –*y* + 1, –*z* for **8**.

[b] Cg refers to the centroid of the ring.

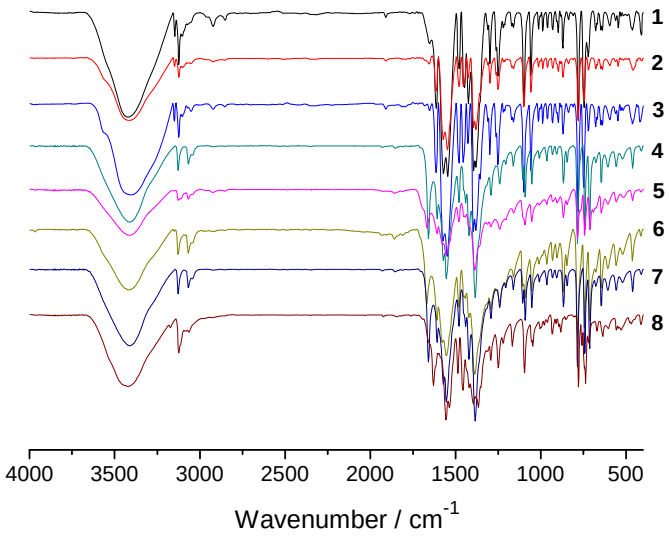

Fig. S1. IR spectra for complexes **1** - **8**.

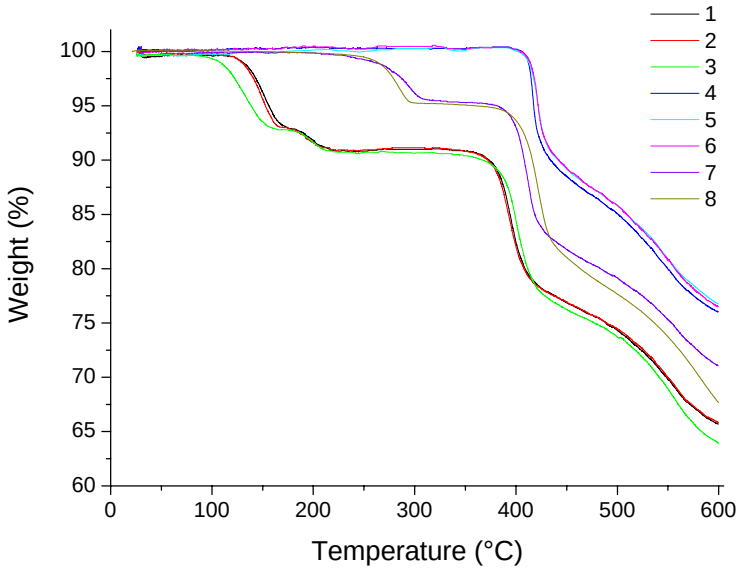

Fig. S2. The TGA curves of complexes **1 - 8**.

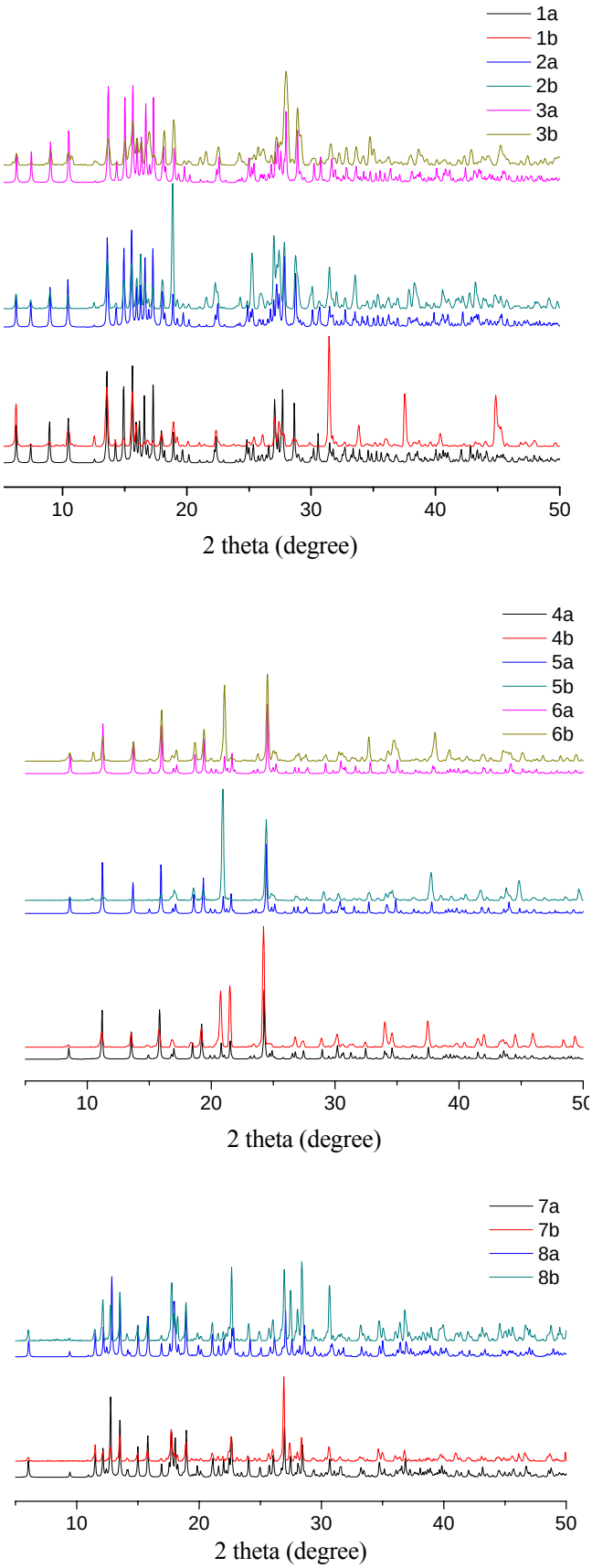

Fig. S3. The X-ray powder diffractions of complexes **1** - **8**: a – simulated; b – as-synthesized**.**

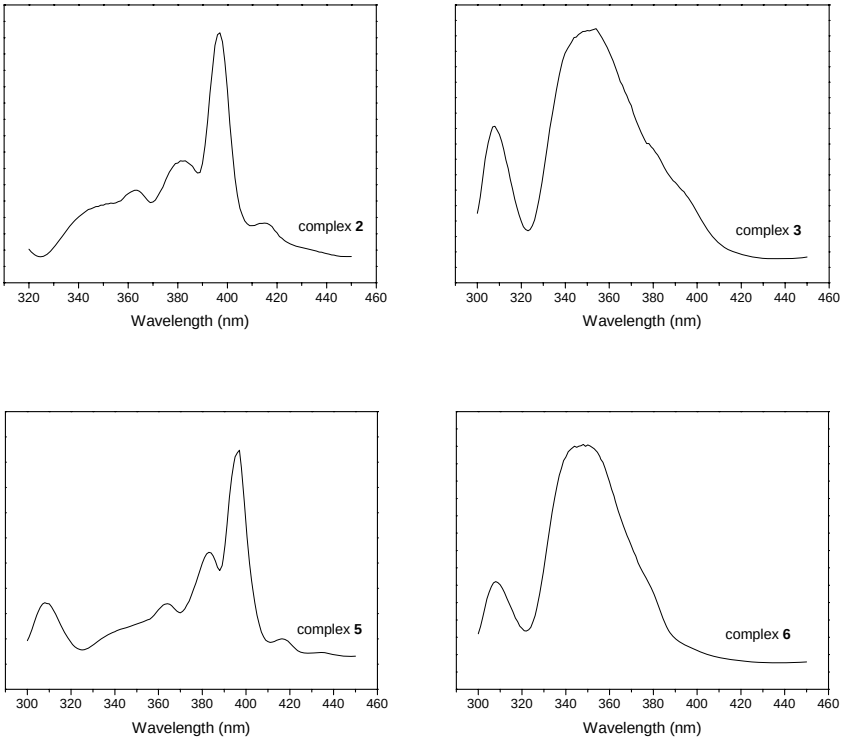

Fig. S4. The excitation spectra of complexes **2**, **3**, **5** and **6**.

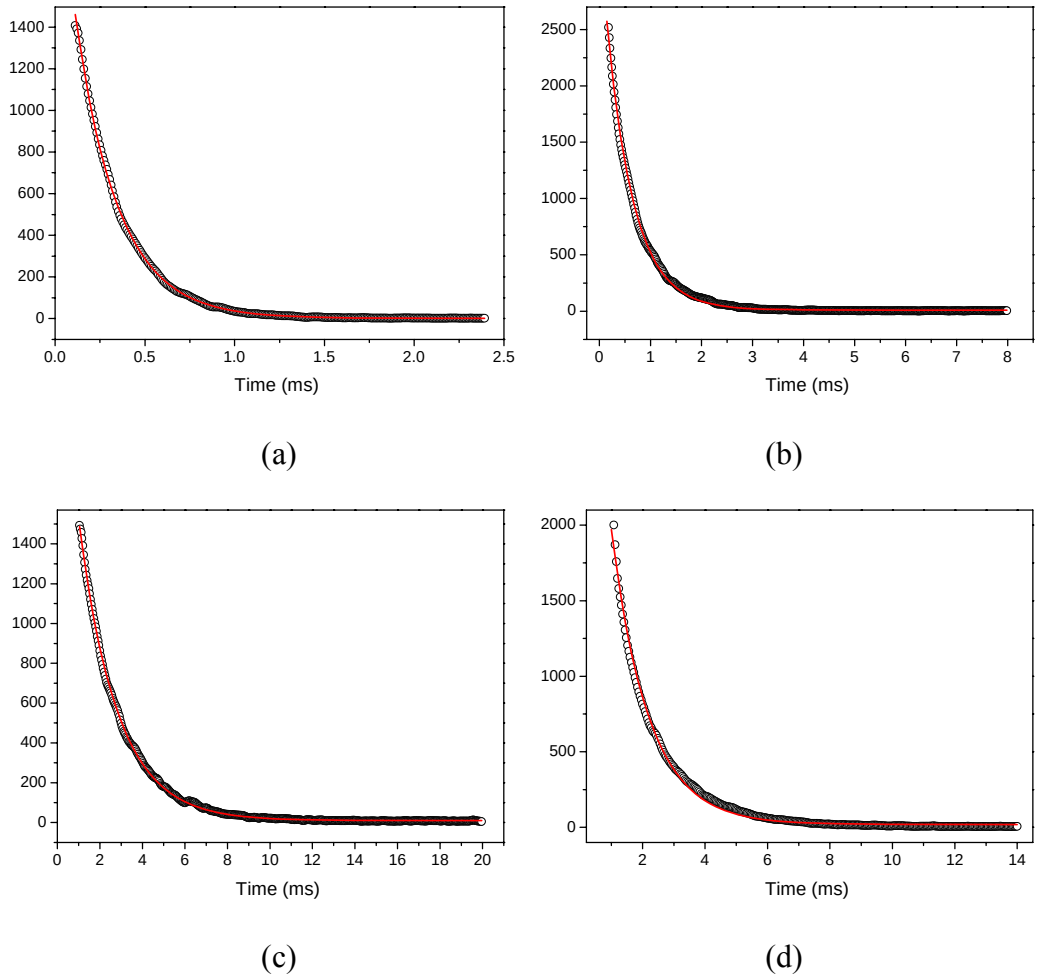

Fig. S5. The luminescence decay curves of (a) **2**, (b) **3**, (c), **5** and (d) **6**.