Electronic Supplementary Information

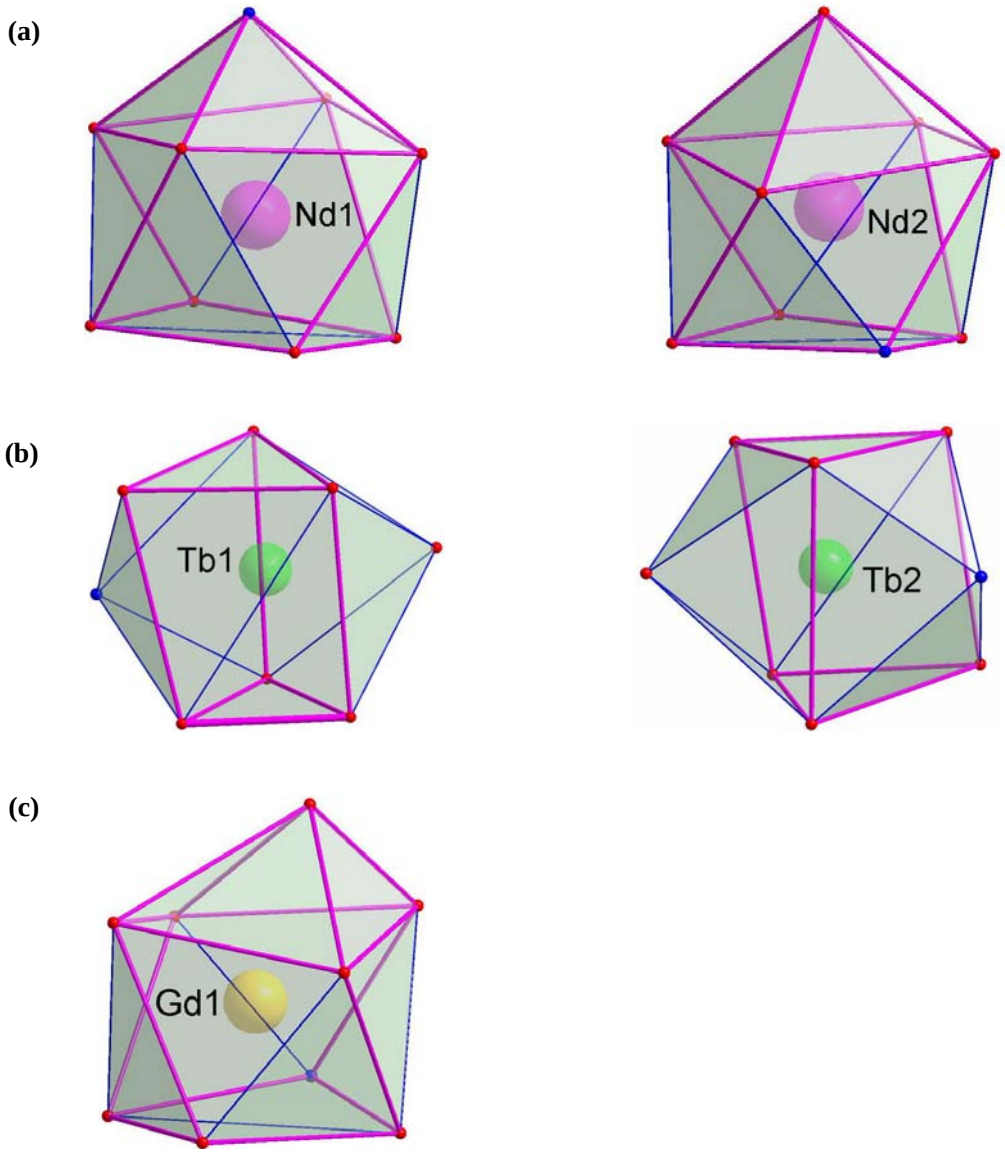

Figure S1 Coordination polyhedra of (a) Nd1 and Nd2 atoms in **1**, (b) Tb1 and Tb2 atoms in **5** and (c) Gd1 in **4**.

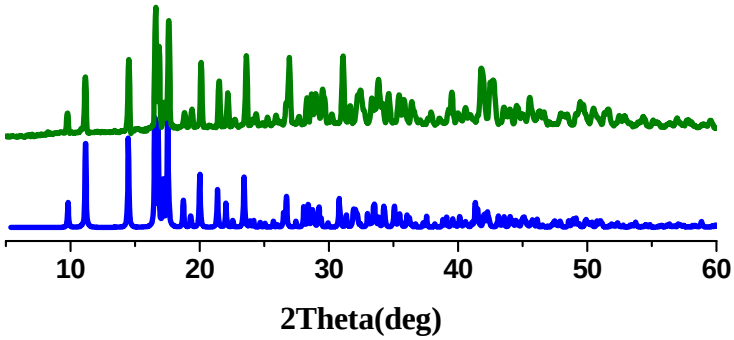

Figure S2 Observed (blue) and calculated (green) X-ray powder diffraction patterns for **1**.

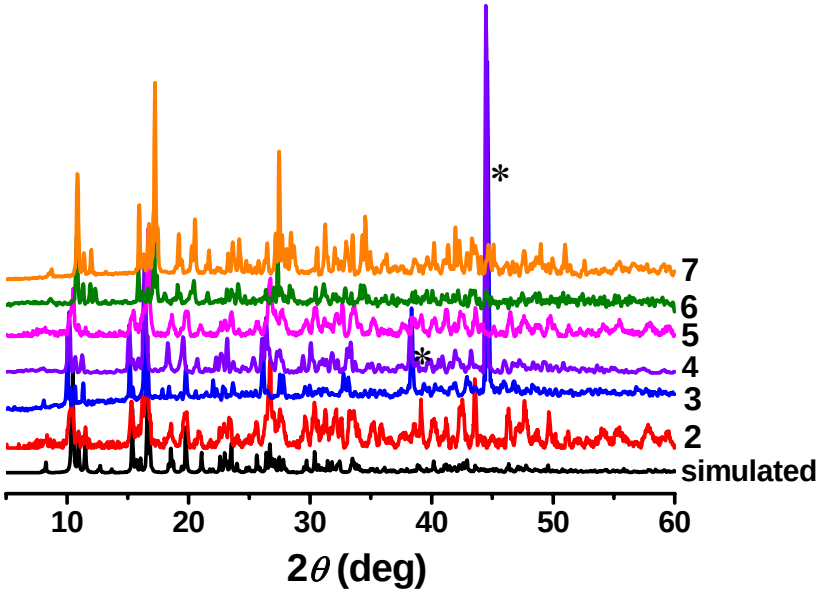

Figure S3 Observed (blue) and calculated (green) X-ray powder diffraction patterns for **2**-**7** (* indicates the pattern of background due to litter sample).

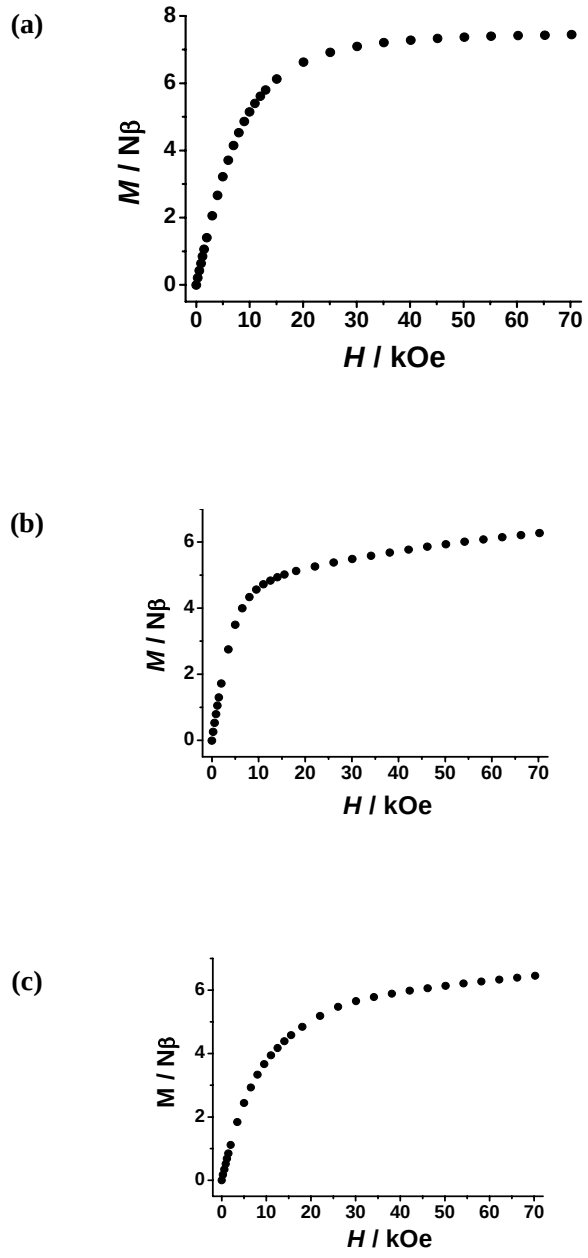

Figure S4 Plots of *M* versus *H* for **4** (a), **6** (b) and **7** (c) at 2 K.

Table S1. Selected Bond lengths (Å) and angles (°) for **1**-**7**.

Compound **1**

Nd(1)-O(3a)	2.429(4)	Nd(2)-O(10d)	2.424(4)
Nd(1)-O(3W)	2.447(5)	Nd(2)-O(7)	2.442(4)
Nd(1)-O(6)	2.468(4)	Nd(2)-O(6W)	2.453(5)
Nd(1)-O(1W)	2.505(5)	Nd(2)-O(4e)	2.467(4)
Nd(1)-O(11b)	2.506(4)	Nd(2)-O(5W)	2.468(5)
Nd(1)-O(9c)	2.514(4)	Nd(2)-O(12)	2.481(4)
Nd(1)-O(1)	2.533(4)	Nd(2)-O(2)	2.514(4)
Nd(1)-O(2W)	2.590(5)	Nd(2)-N(2)	2.583(5)
Nd(1)-N(1)	2.625(5)	Nd(2)-O(4W)	2.694(6)
O(3a)-Nd(1)-O(3W)	106.6(2)	O(11b)-Nd(1)-O(2W)	107.3(2)
O(3a)-Nd(1)-O(6)	78.81(16)	O(9c)-Nd(1)-O(2W)	139.92(18)
O(3W)-Nd(1)-O(6)	146.97(18)	O(1)-Nd(1)-O(2W)	72.83(17)
O(3a)-Nd(1)-O(1W)	68.92(17)	O(3a)-Nd(1)-N(1)	125.18(15)
O(3W)-Nd(1)-O(1W)	135.5(2)	O(3W)-Nd(1)-N(1)	127.3(2)
O(6)-Nd(1)-O(1W)	77.29(17)	O(6)-Nd(1)-N(1)	62.36(15)
O(3a)-Nd(1)-O(11b)	71.67(16)	O(1W)-Nd(1)-N(1)	66.04(16)
O(3W)-Nd(1)-O(11b)	67.63(16)	O(11b)-Nd(1)-N(1)	134.14(15)
O(6)-Nd(1)-O(11b)	84.17(14)	O(9c)-Nd(1)-N(1)	69.41(14)
O(1W)-Nd(1)-O(11b)	138.89(17)	O(1)-Nd(1)-N(1)	60.74(14)
O(3a)-Nd(1)-O(9c)	141.37(16)	O(2W)-Nd(1)-N(1)	118.5(2)
O(3W)-Nd(1)-O(9c)	76.7(2)	O(10d)-Nd(2)-O(7)	92.71(15)
O(6)-Nd(1)-O(9c)	79.53(15)	O(10d)-Nd(2)-O(6W)	86.41(18)
O(1W)-Nd(1)-O(9c)	135.31(17)	O(7)-Nd(2)-O(6W)	148.02(16)
O(11b)-Nd(1)-O(9c)	74.64(16)	O(10d)-Nd(2)-O(4e)	143.87(15)
O(3a)-Nd(1)-O(1)	138.30(16)	O(7)-Nd(2)-O(4e)	82.42(15)
O(3W)-Nd(1)-O(1)	74.88(17)	O(6W)-Nd(2)-O(4e)	79.75(17)
O(6)-Nd(1)-O(1)	123.09(15)	O(10d)-Nd(2)-O(5W)	69.99(15)
O(1W)-Nd(1)-O(1)	81.27(16)	O(7)-Nd(2)-O(5W)	133.29(18)
O(11b)-Nd(1)-O(1)	138.54(15)	O(6W)-Nd(2)-O(5W)	76.10(18)
O(9c)-Nd(1)-O(1)	80.23(14)	O(4e)-Nd(2)-O(5W)	136.27(16)
O(3a)-Nd(1)-O(2W)	69.73(18)	O(10d)-Nd(2)-O(12)	133.60(15)

O(3W)-Nd(1)-O(2W)	68.0(2)	O(7)-Nd(2)-O(12)	124.52(14)
O(6)-Nd(1)-O(2W)	140.3(2)	O(6W)-Nd(2)-O(12)	75.53(16)
O(1W)-Nd(1)-O(2W)	69.3(2)	O(4e)-Nd(2)-O(12)	74.65(14)
O(4e)-Nd(2)-N(2)	70.97(14)	O(5W)-Nd(2)-O(12)	64.34(14)
O(5W)-Nd(2)-N(2)	100.57(16)	O(10d)-Nd(2)-O(2)	72.77(15)
O(12)-Nd(2)-N(2)	61.80(14)	O(7)-Nd(2)-O(2)	76.39(13)
O(2)-Nd(2)-N(2)	127.09(14)	O(6W)-Nd(2)-O(2)	72.83(14)
O(10d)-Nd(2)-O(4W)	70.77(17)	O(4e)-Nd(2)-O(2)	71.29(14)
O(7)-Nd(2)-O(4W)	66.14(16)	O(5W)-Nd(2)-O(2)	132.30(15)
O(6W)-Nd(2)-O(4W)	141.50(17)	O(12)-Nd(2)-O(2)	136.70(15)
O(4e)-Nd(2)-O(4W)	135.94(16)	O(10d)-Nd(2)-N(2)	137.51(16)
O(6W)-Nd(2)-N(2)	132.91(17)	O(7)-Nd(2)-N(2)	63.08(14)

Compound **2**

Sm(1)-O(10a)	2.400(3)	Sm(2)-O(2)	2.354(3)
Sm(1)-O(1)	2.425(3)	Sm(2)-O(8c)	2.355(3)
Sm(1)-O(6)	2.440(3)	Sm(2)-O(3c)	2.376(4)
Sm(1)-O(2w)	2.451(3)	Sm(2)-O(9d)	2.410(3)
Sm(1)-O(1w)	2.473(3)	Sm(2)-O(12)	2.425(3)
Sm(1)-O(3w)	2.495(3)	Sm(2)-O(5e)	2.427(3)
Sm(1)-N(1)	2.543(4)	Sm(2)-O(7)	2.439(3)
Sm(1)-O(12b)	2.571(3)	Sm(2)-N(2)	2.539(4)
Sm(1)-O(11b)	2.580(3)		
O(10a)-Sm(1)-O(1)	86.96(12)	O(3W)-Sm(1)-N(1)	113.74(12)
O(10a)-Sm(1)-O(6)	145.72(11)	O(10a)-Sm(1)-O(12b)	75.72(10)
O(1)-Sm(1)-O(6)	126.35(10)	O(1)-Sm(1)-O(12b)	75.03(11)
O(10a)-Sm(1)-O(2W)	81.97(13)	O(6)-Sm(1)-O(12b)	117.01(10)
O(1)-Sm(1)-O(2W)	72.47(12)	O(2W)-Sm(1)-O(12b)	141.23(11)
O(6)-Sm(1)-O(2W)	99.25(12)	O(1W)-Sm(1)-O(12b)	71.22(11)
O(10a)-Sm(1)-O(1W)	77.79(12)	O(3W)-Sm(1)-O(12b)	134.59(11)
O(1)-Sm(1)-O(1W)	145.43(11)	N(1)-Sm(1)-O(12b)	109.75(11)
O(6)-Sm(1)-O(1W)	77.16(10)	O(10a)-Sm(1)-O(11b)	126.22(10)
O(2W)-Sm(1)-O(1W)	134.05(12)	O(1)-Sm(1)-O(11b)	78.15(11)

O(10a)-Sm(1)-O(3W)	75.57(12)	O(6)-Sm(1)-O(11b)	74.75(10)
O(1)-Sm(1)-O(3W)	136.89(12)	O(2W)-Sm(1)-O(11b)	137.90(12)
O(6)-Sm(1)-O(3W)	73.77(12)	O(1W)-Sm(1)-O(11b)	86.13(11)
O(2W)-Sm(1)-O(3W)	66.32(12)	O(3W)-Sm(1)-O(11b)	143.27(11)
O(1W)-Sm(1)-O(3W)	68.84(12)	N(1)-Sm(1)-O(11b)	66.49(11)
O(10a)-Sm(1)-N(1)	146.23(12)	O(12b)-Sm(1)-O(11b)	50.55(9)
O(1)-Sm(1)-N(1)	63.79(11)	O(2)-Sm(2)-O(8c)	77.79(14)
O(6)-Sm(1)-N(1)	63.09(10)	O(2)-Sm(2)-O(3c)	143.15(13)
O(2W)-Sm(1)-N(1)	73.66(12)	O(8c)-Sm(2)-O(3c)	78.80(14)
O(1W)-Sm(1)-N(1)	135.95(11)	O(2)-Sm(2)-O(9d)	77.96(12)
O(8c)-Sm(2)-O(5e)	119.68(13)	O(8c)-Sm(2)-O(9d)	85.45(12)
O(3c)-Sm(2)-O(5e)	71.27(13)	O(3c)-Sm(2)-O(9d)	72.15(13)
O(9d)-Sm(2)-O(5e)	129.35(12)	O(2)-Sm(2)-O(12)	87.38(11)
O(12)-Sm(2)-O(5e)	82.76(11)	O(8c)-Sm(2)-O(12)	156.28(12)
O(2)-Sm(2)-O(7)	82.60(12)	O(3c)-Sm(2)-O(12)	103.80(12)
O(8c)-Sm(2)-O(7)	69.98(11)	O(9d)-Sm(2)-O(12)	73.31(11)
O(3c)-Sm(2)-O(7)	115.12(13)	O(2)-Sm(2)-O(5e)	145.56(12)
O(9d)-Sm(2)-O(7)	151.40(11)	O(5e)-Sm(2)-O(7)	77.30(12)
O(12)-Sm(2)-O(7)	126.76(10)	O(2)-Sm(2)-N(2)	75.42(12)
O(9d)-Sm(2)-N(2)	129.36(12)	O(8c)-Sm(2)-N(2)	128.51(12)
O(12)-Sm(2)-N(2)	63.25(11)	O(3c)-Sm(2)-N(2)	141.00(13)
O(5e)-Sm(2)-N(2)	70.65(11)	O(7)-Sm(2)-N(2)	63.61(11)

Compound **3**

Eu(1)-O(10a)	2.390(4)	Eu(2)-O(8c)	2.337(5)
Eu(1)-O(1)	2.410(5)	Eu(2)-O(2)	2.344(5)
Eu(1)-O(6)	2.425(4)	Eu(2)-O(3c)	2.351(5)
Eu(1)-O(2W)	2.432(5)	Eu(2)-O(9d)	2.391(5)
Eu(1)-O(1W)	2.445(5)	Eu(2)-O(12)	2.416(4)
Eu(1)-O(3W)	2.481(5)	Eu(2)-O(5e)	2.422(4)
Eu(1)-N(1)	2.522(5)	Eu(2)-O(7)	2.422(4)
Eu(1)-O(11b)	2.566(5)	Eu(2)-N(2)	2.526(5)
Eu(1)-O(12b)	2.568(4)		

O(10a)-Eu(1)-O(1)	86.49(17)	O(1W)-Eu(1)-O(11b)	86.18(16)
O(10a)-Eu(1)-O(6)	145.39(16)	O(3W)-Eu(1)-O(11b)	143.09(16)
O(1)-Eu(1)-O(6)	127.11(15)	N(1)-Eu(1)-O(11b)	66.47(15)
O(10a)-Eu(1)-O(2W)	81.82(18)	O(10a)-Eu(1)-O(12b)	75.78(14)
O(1)-Eu(1)-O(2W)	72.87(17)	O(1)-Eu(1)-O(12b)	74.63(15)
O(6)-Eu(1)-O(2W)	99.05(17)	O(6)-Eu(1)-O(12b)	117.26(15)
O(10a)-Eu(1)-O(1W)	77.88(17)	O(2W)-Eu(1)-O(12b)	141.31(16)
O(1)-Eu(1)-O(1W)	144.93(16)	O(1W)-Eu(1)-O(12b)	71.19(15)
O(6)-Eu(1)-O(1W)	77.02(15)	O(3W)-Eu(1)-O(12b)	134.52(16)
O(2W)-Eu(1)-O(1W)	133.94(17)	N(1)-Eu(1)-O(12b)	109.76(15)
O(10a)-Eu(1)-O(3W)	75.68(17)	O(11b)-Eu(1)-O(12b)	50.60(13)
O(1)-Eu(1)-O(3W)	137.22(17)	O(8c)-Eu(2)-O(2)	77.6(2)
O(6)-Eu(1)-O(3W)	73.21(17)	O(8c)-Eu(2)-O(3c)	78.94(19)
O(2W)-Eu(1)-O(3W)	66.37(17)	O(2)-Eu(2)-O(3c)	143.20(18)
O(1W)-Eu(1)-O(3W)	68.71(17)	O(8c)-Eu(2)-O(9d)	84.84(17)
O(10a)-Eu(1)-N(1)	146.03(18)	O(2)-Eu(2)-O(9d)	77.79(17)
O(1)-Eu(1)-N(1)	64.19(16)	O(3c)-Eu(2)-O(9d)	72.24(19)
O(6)-Eu(1)-N(1)	63.45(15)	O(8c)-Eu(2)-O(12)	155.64(18)
O(2W)-Eu(1)-N(1)	73.68(18)	O(2)-Eu(2)-O(12)	86.87(16)
O(1W)-Eu(1)-N(1)	136.05(16)	O(3c)-Eu(2)-O(12)	104.21(17)
O(3W)-Eu(1)-N(1)	113.75(17)	O(9d)-Eu(2)-O(12)	73.53(15)
O(10a)-Eu(1)-O(11b)	126.32(14)	O(8c)-Eu(2)-O(5e)	120.18(19)
O(1)-Eu(1)-O(11b)	78.10(16)	O(2)-Eu(2)-O(5e)	145.71(17)
O(6)-Eu(1)-O(11b)	75.12(15)	O(3c)-Eu(2)-O(5e)	71.07(17)
O(2W)-Eu(1)-O(11b)	137.95(16)	O(3c)-Eu(2)-O(7)	114.29(19)
O(9d)-Eu(2)-O(5e)	129.34(17)	O(9d)-Eu(2)-O(7)	151.12(15)
O(12)-Eu(2)-O(5e)	82.97(15)	O(12)-Eu(2)-O(7)	127.23(14)
O(8c)-Eu(2)-O(7)	69.83(16)	O(5e)-Eu(2)-O(7)	77.26(16)
O(2)-Eu(2)-O(7)	83.24(17)	O(8c)-Eu(2)-N(2)	128.38(17)
O(3c)-Eu(2)-N(2)	141.09(17)	O(2)-Eu(2)-N(2)	75.31(17)
O(9d)-Eu(2)-N(2)	129.62(17)	O(5e)-Eu(2)-N(2)	70.86(16)
O(12)-Eu(2)-N(2)	63.28(15)	O(7)-Eu(2)-N(2)	64.06(15)

Compound **4**

Gd(1)-O(10a)	2.373(5)	Gd(2)-O(2)	2.327(5)
Gd(1)-O(1)	2.411(5)	Gd(2)-O(8c)	2.333(5)
Gd(1)-O(6)	2.423(5)	Gd(2)-O(3c)	2.338(6)
Gd(1)-O(2W)	2.425(5)	Gd(2)-O(9d)	2.380(5)
Gd(1)-O(1W)	2.431(5)	Gd(2)-O(5e)	2.406(5)
Gd(1)-O(3W)	2.472(6)	Gd(2)-O(12)	2.407(5)
Gd(1)-N(1)	2.518(6)	Gd(2)-O(7)	2.409(5)
Gd(1)-O(11b)	2.543(5)	Gd(2)-N(2)	2.516(5)
Gd(1)-O(12b)	2.554(4)		
O(10a)-Gd(1)-O(1)	86.28(18)	O(3W)-Gd(1)-O(11b)	142.97(18)
O(10a)-Gd(1)-O(6)	145.38(17)	N(1)-Gd(1)-O(11b)	66.61(17)
O(1)-Gd(1)-O(6)	127.24(17)	O(10a)-Gd(1)-O(12b)	75.90(16)
O(10a)-Gd(1)-O(2W)	81.40(19)	O(1)-Gd(1)-O(12b)	75.05(17)
O(1)-Gd(1)-O(2W)	72.78(19)	O(6)-Gd(1)-O(12b)	117.20(16)
O(6)-Gd(1)-O(2W)	99.11(19)	O(2W)-Gd(1)-O(12b)	141.48(18)
O(10a)-Gd(1)-O(1W)	78.47(18)	O(1W)-Gd(1)-O(12b)	71.04(17)
O(1)-Gd(1)-O(1W)	145.26(18)	O(3W)-Gd(1)-O(12b)	134.23(18)
O(6)-Gd(1)-O(1W)	76.61(17)	N(1)-Gd(1)-O(12b)	110.20(16)
O(2W)-Gd(1)-O(1W)	133.87(19)	O(11b)-Gd(1)-O(12b)	50.90(15)
O(10a)-Gd(1)-O(3W)	75.51(19)	O(2)-Gd(2)-O(8c)	77.8(2)
O(1)-Gd(1)-O(3W)	136.94(19)	O(2)-Gd(2)-O(3c)	143.2(2)
O(6)-Gd(1)-O(3W)	73.26(18)	O(8c)-Gd(2)-O(3c)	78.4(2)
O(2W)-Gd(1)-O(3W)	66.2(2)	O(2)-Gd(2)-O(9d)	77.85(19)
O(1W)-Gd(1)-O(3W)	68.74(19)	O(8c)-Gd(2)-O(9d)	84.54(18)
O(10a)-Gd(1)-N(1)	145.70(19)	O(3c)-Gd(2)-O(9d)	72.3(2)
O(1)-Gd(1)-N(1)	64.25(17)	O(2)-Gd(2)-O(5e)	146.02(18)
O(6)-Gd(1)-N(1)	63.52(17)	O(8c)-Gd(2)-O(5e)	120.5(2)
O(2W)-Gd(1)-N(1)	73.64(19)	O(3c)-Gd(2)-O(5e)	70.79(19)
O(1W)-Gd(1)-N(1)	135.81(18)	O(9d)-Gd(2)-O(5e)	128.70(19)
O(3W)-Gd(1)-N(1)	113.63(19)	O(2)-Gd(2)-O(12)	86.75(18)
O(10a)-Gd(1)-O(11b)	126.73(16)	O(8c)-Gd(2)-O(12)	155.17(19)

O(1)-Gd(1)-O(11b)	78.48(17)	O(3c)-Gd(2)-O(12)	104.3(2)
O(6)-Gd(1)-O(11b)	74.91(17)	O(9d)-Gd(2)-O(12)	73.19(17)
O(2W)-Gd(1)-O(11b)	138.12(18)	O(5e)-Gd(2)-O(12)	82.84(17)
O(1W)-Gd(1)-O(11b)	85.93(17)	O(2)-Gd(2)-O(7)	83.79(18)
O(2)-Gd(2)-N(2)	75.63(18)	O(8c)-Gd(2)-O(7)	70.27(17)
O(8c)-Gd(2)-N(2)	128.82(19)	O(3c)-Gd(2)-O(7)	113.7(2)
O(3c)-Gd(2)-N(2)	140.82(19)	O(9d)-Gd(2)-O(7)	151.49(18)
O(9d)-Gd(2)-N(2)	129.97(19)	O(5e)-Gd(2)-O(7)	77.40(18)
O(5e)-Gd(2)-N(2)	70.74(17)	O(12)-Gd(2)-O(7)	127.65(15)
O(12)-Gd(2)-N(2)	63.71(17)	O(7)-Gd(2)-N(2)	64.05(17)
Compound **5**			
Tb(1)-O(10a)	2.308(5)	Tb(2)-O(2)	2.292(5)
Tb(1)-O(2W)	2.331(5)	Tb(2)-O(8c)	2.304(5)
Tb(1)-O(1W)	2.337(5)	Tb(2)-O(3c)	2.323(5)
Tb(1)-O(1)	2.354(5)	Tb(2)-O(5d)	2.355(5)
Tb(1)-O(6)	2.398(5)	Tb(2)-O(9e)	2.357(4)
Tb(1)-O(12b)	2.454(4)	Tb(2)-O(12)	2.403(4)
Tb(1)-N(1)	2.475(5)	Tb(2)-O(7)	2.443(4)
Tb(1)-O(11b)	2.503(5)	Tb(2)-N(2)	2.512(5)
O(10a)-Tb(1)-O(2W)	80.02(17)	N(1)-Tb(1)-O(11b)	71.66(16)
O(10a)-Tb(1)-O(1W)	76.43(17)	O(2)-Tb(2)-O(8c)	79.54(18)
O(2W)-Tb(1)-O(1W)	100.72(18)	O(2)-Tb(2)-O(3c)	144.69(18)
O(10a)-Tb(1)-O(1)	83.43(17)	O(8c)-Tb(2)-O(3c)	81.77(17)
O(2W)-Tb(1)-O(1)	87.83(17)	O(2)-Tb(2)-O(5d)	142.96(17)
O(1W)-Tb(1)-O(1)	156.27(16)	O(8c)-Tb(2)-O(5d)	116.02(17)
O(10a)-Tb(1)-O(6)	143.36(16)	O(3c)-Tb(2)-O(5d)	72.35(17)
O(2W)-Tb(1)-O(6)	85.17(16)	O(2)-Tb(2)-O(9e)	76.21(17)
O(1W)-Tb(1)-O(6)	73.69(15)	O(8c)-Tb(2)-O(9e)	84.36(16)
O(1)-Tb(1)-O(6)	129.49(15)	O(3c)-Tb(2)-O(9e)	72.35(17)
O(10a)-Tb(1)-O(12b)	75.79(15)	O(5d)-Tb(2)-O(9e)	135.57(16)
O(2W)-Tb(1)-O(12b)	154.67(16)	O(2)-Tb(2)-O(12)	94.18(16)
O(1W)-Tb(1)-O(12b)	80.89(16)	O(8c)-Tb(2)-O(12)	158.89(16)

O(1)-Tb(1)-O(12b)	82.11(15)	O(3c)-Tb(2)-O(12)	92.61(16)
O(6)-Tb(1)-O(12b)	119.04(15)	O(5d)-Tb(2)-O(12)	81.01(15)
O(10a)-Tb(1)-N(1)	141.07(17)	O(9e)-Tb(2)-O(12)	74.56(15)
O(2W)-Tb(1)-N(1)	76.42(17)	O(2)-Tb(2)-O(7)	77.11(16)
O(1W)-Tb(1)-N(1)	138.15(17)	O(8c)-Tb(2)-O(7)	71.63(16)
O(1)-Tb(1)-N(1)	65.26(17)	O(3c)-Tb(2)-O(7)	124.26(16)
O(6)-Tb(1)-N(1)	64.46(16)	O(5d)-Tb(2)-O(7)	76.88(16)
O(12b)-Tb(1)-N(1)	119.17(16)	O(9e)-Tb(2)-O(7)	146.79(15)
O(10a)-Tb(1)-O(11b)	127.61(15)	O(12)-Tb(2)-O(7)	126.94(15)
O(2W)-Tb(1)-O(11b)	148.01(15)	O(2)-Tb(2)-N(2)	73.48(17)
O(1W)-Tb(1)-O(11b)	101.54(17)	O(8c)-Tb(2)-N(2)	131.52(17)
O(1)-Tb(1)-O(11b)	80.87(16)	O(3c)-Tb(2)-N(2)	139.26(17)
O(6)-Tb(1)-O(11b)	79.39(15)	O(5d)-Tb(2)-N(2)	71.50(17)
O(12b)-Tb(1)-O(11b)	52.73(14)	O(9e)-Tb(2)-N(2)	125.40(16)
O(7)-Tb(2)-N(2)	63.60(15)	O(12)-Tb(2)-N(2)	63.76(16)
Compound **6**			
Dy(1)-O(10a)	2.298(4)	Dy(2)-O(2)	2.292(4)
Dy(1)-O(1W)	2.323(4)	Dy(2)-O(8c)	2.296(4)
Dy(1)-O(2W)	2.329(5)	Dy(2)-O(3c)	2.297(5)
Dy(1)-O(1)	2.336(4)	Dy(2)-O(9d)	2.345(4)
Dy(1)-O(6)	2.376(4)	Dy(2)-O(5e)	2.362(4)
Dy(1)-N(1)	2.453(5)	Dy(2)-O(12)	2.390(4)
Dy(1)-O(12b)	2.455(4)	Dy(2)-O(7)	2.422(4)
Dy(1)-O(11b)	2.488(4)	Dy(2)-N(2)	2.503(5)
O(10a)-Dy(1)-O(1W)	76.12(17)	O(12b)-Dy(1)-O(11b)	52.79(13)
O(10a)-Dy(1)-O(2W)	79.24(17)	O(2)-Dy(2)-O(8c)	79.50(18)
O(1W)-Dy(1)-O(2W)	101.58(18)	O(2)-Dy(2)-O(3c)	144.69(18)
O(10a)-Dy(1)-O(1)	82.78(16)	O(8c)-Dy(2)-O(3c)	80.91(18)
O(1W)-Dy(1)-O(1)	154.87(15)	O(2)-Dy(2)-O(9d)	76.61(16)
O(2W)-Dy(1)-O(1)	87.53(17)	O(8c)-Dy(2)-O(9d)	83.71(16)
O(10a)-Dy(1)-O(6)	142.66(15)	O(3c)-Dy(2)-O(9d)	72.27(18)
O(1W)-Dy(1)-O(6)	74.33(15)	O(2)-Dy(2)-O(5e)	143.78(17)

O(2W)-Dy(1)-O(6)	84.82(16)	O(8c)-Dy(2)-O(5e)	117.43(17)
O(1)-Dy(1)-O(6)	130.26(15)	O(3c)-Dy(2)-O(5e)	71.53(18)
O(10a)-Dy(1)-N(1)	140.73(17)	O(9d)-Dy(2)-O(5e)	133.74(16)
O(1W)-Dy(1)-N(1)	138.89(15)	O(2)-Dy(2)-O(12)	91.53(16)
O(2W)-Dy(1)-N(1)	76.50(17)	O(8c)-Dy(2)-O(12)	157.39(15)
O(1)-Dy(1)-N(1)	65.85(15)	O(3c)-Dy(2)-O(12)	95.51(16)
O(6)-Dy(1)-N(1)	64.57(15)	O(9d)-Dy(2)-O(12)	73.99(14)
O(10a)-Dy(1)-O(12b)	76.85(14)	O(5e)-Dy(2)-O(12)	81.83(14)
O(1W)-Dy(1)-O(12b)	80.41(16)	O(2)-Dy(2)-O(7)	79.10(15)
O(2W)-Dy(1)-O(12b)	154.77(15)	O(8c)-Dy(2)-O(7)	71.36(15)
O(1)-Dy(1)-O(12b)	81.63(15)	O(3c)-Dy(2)-O(7)	121.36(17)
O(6)-Dy(1)-O(12b)	119.43(14)	O(9d)-Dy(2)-O(7)	147.86(15)
N(1)-Dy(1)-O(12b)	118.55(15)	O(5e)-Dy(2)-O(7)	77.20(15)
O(10a)-Dy(1)-O(11b)	128.88(14)	O(12)-Dy(2)-O(7)	127.61(13)
O(1W)-Dy(1)-O(11b)	100.77(17)	O(2)-Dy(2)-N(2)	73.99(16)
O(2W)-Dy(1)-O(11b)	147.76(16)	O(8c)-Dy(2)-N(2)	131.13(16)
O(1)-Dy(1)-O(11b)	81.91(16)	O(3c)-Dy(2)-N(2)	139.42(17)
O(6)-Dy(1)-O(11b)	79.19(14)	O(9d)-Dy(2)-N(2)	127.11(16)
N(1)-Dy(1)-O(11b)	71.37(15)	O(5e)-Dy(2)-N(2)	71.10(16)
O(12)-Dy(2)-N(2)	64.01(14)	O(7)-Dy(2)-N(2)	63.85(15)
Compound **7**			
Ho(1)-O(10a)	2.296(3)	Ho(2)-O(2)	2.279(3)
Ho(1)-O(1W)	2.304(3)	Ho(2)-O(8c)	2.293(3)
Ho(1)-O(2W)	2.316(3)	Ho(2)-O(3c)	2.294(3)
Ho(1)-O(1)	2.325(3)	Ho(2)-O(9d)	2.343(3)
Ho(1)-O(6)	2.378(3)	Ho(2)-O(5e)	2.356(3)
Ho(1)-N(1)	2.448(4)	Ho(2)-O(12)	2.381(3)
Ho(1)-O(12b)	2.450(3)	Ho(2)-O(7)	2.417(3)
Ho(1)-O(11b)	2.476(3)	Ho(2)-N(2)	2.498(4)
O(10a)-Ho(1)-O(1W)	76.46(13)	O(12b)-Ho(1)-O(11b)	52.94(10)
O(10a)-Ho(1)-O(2W)	79.21(13)	O(2)-Ho(2)-O(8c)	79.84(14)
O(1W)-Ho(1)-O(2W)	100.36(13)	O(2)-Ho(2)-O(3c)	144.94(14)

O(10a)-Ho(1)-O(1)	82.47(12)	O(8c)-Ho(2)-O(3c)	80.80(14)
O(1W)-Ho(1)-O(1)	155.05(12)	O(2)-Ho(2)-O(9d)	76.52(12)
O(2W)-Ho(1)-O(1)	88.51(13)	O(8c)-Ho(2)-O(9d)	83.83(12)
O(10a)-Ho(1)-O(6)	142.79(12)	O(3c)-Ho(2)-O(9d)	72.56(14)
O(1W)-Ho(1)-O(6)	73.80(11)	O(2)-Ho(2)-O(5e)	143.59(13)
O(2W)-Ho(1)-O(6)	84.62(12)	O(8c)-Ho(2)-O(5e)	116.44(13)
O(1)-Ho(1)-O(6)	130.63(11)	O(3c)-Ho(2)-O(5e)	71.46(14)
O(10a)-Ho(1)-N(1)	140.40(13)	O(9d)-Ho(2)-O(5e)	134.47(12)
O(1W)-Ho(1)-N(1)	138.67(12)	O(2)-Ho(2)-O(12)	92.30(12)
O(2W)-Ho(1)-N(1)	76.80(13)	O(8c)-Ho(2)-O(12)	157.72(12)
O(1)-Ho(1)-N(1)	65.95(11)	O(3c)-Ho(2)-O(12)	94.72(12)
O(6)-Ho(1)-N(1)	64.87(11)	O(9d)-Ho(2)-O(12)	74.04(11)
O(10a)-Ho(1)-O(12b)	76.53(11)	O(5e)-Ho(2)-O(12)	82.05(11)
O(1W)-Ho(1)-O(12b)	80.64(12)	O(2)-Ho(2)-O(7)	78.65(12)
O(2W)-Ho(1)-O(12b)	154.77(12)	O(8c)-Ho(2)-O(7)	71.24(11)
O(1)-Ho(1)-O(12b)	81.59(11)	O(3c)-Ho(2)-O(7)	121.62(13)
O(6)-Ho(1)-O(12b)	119.30(11)	O(9d)-Ho(2)-O(7)	147.42(11)
N(1)-Ho(1)-O(12b)	119.02(11)	O(5e)-Ho(2)-O(7)	76.90(12)
O(10a)-Ho(1)-O(11b)	128.67(11)	O(12)-Ho(2)-O(7)	127.94(10)
O(1W)-Ho(1)-O(11b)	100.87(12)	O(2)-Ho(2)-N(2)	73.73(12)
O(2W)-Ho(1)-O(11b)	148.37(12)	O(8c)-Ho(2)-N(2)	131.32(12)
O(1)-Ho(1)-O(11b)	81.96(12)	O(3c)-Ho(2)-N(2)	139.38(13)
O(6)-Ho(1)-O(11b)	79.13(11)	O(9d)-Ho(2)-N(2)	126.74(12)
N(1)-Ho(1)-O(11b)	71.75(11)	O(5e)-Ho(2)-N(2)	71.44(12)
O(7)-Ho(2)-N(2)	64.00(11)	O(12)-Ho(2)-N(2)	64.25(11)

Symmetry codes: *a*) x, y-1, z; *b*) x+1, -y+1, z-1/2; *c*) x+1, -y+2, z-1/2; *d*) x, -y+2, z-1/2; *e*) x, -y+2, z+1/2 for **1**; *a*) -x, y-1, -z+1/2;.*b*) -x, y, -z+1/2; *c*) -x+1/2, y-1/2, -z+1/2; *d*) x, y-1, z; *e*) x, -y+1, z-1/2 for **2**; *a*) –x, y-1, -z+1/2; *b*) -x, y, -z+1/2; *c*) -x+1/2, y-1/2, -z+1/2; *d*) x, y-1, z; *e*) x, -y+1, z-1/2; for **3**; *a*) -x, y-1, -z+1/2; *b*) -x,y,-z+1/2; *c*) -x+1/2, y-1/2, -z+1/2; *d*) x, y-1, z; *e*) x, -y+1, z-1/2; for **4**; *a*) -x, y-1, -z+1/2; *b*) -x, y, -z+1/2; *c*) -x+1/2, y-1/2, -z+1/2; *d*) x, -y+1, z-1/2; *e*) x, y-1, z for **5**; *a*) -x, y-1, -z+1/2; *b*) -x, y, -z+1/2; *c*) -x+1/2, y-1/2, -z+1/2; *d*) x, -y+1, z-1/2; *e*) x, y-1, z for **6**; *a*) -x, y-1, -z+1/2; *b*) -x, y, -z+1/2; *c*) -x+1/2, y-1/2, -z+1/2; *d*) x, y-1, z; *e*) x, -y+1, z-1/2 for **7**.

Table **S2**: Coordination number (CN) and average bond lengths (Å) for **1**-**7**.

compound	CN	Ln-$O_{carboxylate}$	Ln-O_{water}	Ln-N
1	9, 9	2.478	2.530	2.603
2	8, 9	2.433	2.476	2.541
3	8, 9	2.420	2.454	2.526
4	8, 9	2.409	2.448	2.518
5	8, 8	2.375	2.333	2.493
6	8, 8	2.363	2.326	2.478
7	8, 8	2.357	2.310	2.473