

Supporting Information

Arenedisulfonate-Lanthanide Supramolecular Architectures with Phenanthroline as Co-ligand: Syntheses and Structures

Jiong-Peng Zhao, Bo-Wen Hu, Fu-Chen Liu, Xin Hu, Yong-Fei Zeng, and Xian-He Bu*

Table S1. Bond Lengths (Å) and Angles (°) with Standard Deviations of **1-4**

complex 1			
Eu(1)-O(4)	2.330(2)	Eu(1)-N(4)	2.647(3)
Eu(1)-O(1)	2.369(2)	Eu(1)-N(2)	2.674(3)
Eu(1)-O(7)	2.432(2)	Eu(1)-N(3)	2.677(3)
Eu(1)-O(1W)	2.469(3)	Eu(1)-N(1)	2.680(3)
Eu(1)-O(2W)	2.512(3)	O(4)-Eu(1)-N(3)	74.57(8)
O(4)-Eu(1)-O(1)	82.89(9)	O(1)-Eu(1)-N(3)	70.78(8)
O(4)-Eu(1)-O(7)	81.63(9)	O(7)-Eu(1)-N(3)	67.35(8)
O(1)-Eu(1)-O(7)	137.84(8)	N(4)-Eu(1)-N(3)	61.78(9)
O(4)-Eu(1)-N(4)	136.25(8)	N(2)-Eu(1)-N(3)	135.62(9)
O(1)-Eu(1)-N(4)	80.41(9)	O(4)-Eu(1)-N(1)	72.79(9)
O(7)-Eu(1)-N(4)	84.26(9)	O(1)-Eu(1)-N(1)	75.98(9)
O(4)-Eu(1)-N(2)	75.77(9)	O(7)-Eu(1)-N(1)	134.45(9)
O(1)-Eu(1)-N(2)	136.20(9)	N(4)-Eu(1)-N(1)	139.34(9)
O(7)-Eu(1)-N(2)	76.30(9)	N(2)-Eu(1)-N(1)	61.38(9)
N(4)-Eu(1)-N(2)	139.53(9)	N(3)-Eu(1)-N(1)	135.56(9)
complex 2			
Gd(1)-O(4)	2.315(2)	Gd(1)-N(4)	2.632(3)
Gd(1)-O(1)	2.347(2)	Gd(1)-N(2)	2.657(3)
Gd(1)-O(7)	2.409(2)	Gd(1)-N(1)	2.667(3)
Gd(1)-O(1W)	2.454(3)	Gd(1)-N(3)	2.668(3)

Gd(1)-O(2W)	2.496(3)	O(4)-Gd(1)-N(1)	72.91(8)
O(4)-Gd(1)-O(1)	83.08(9)	O(1)-Gd(1)-N(1)	75.93(9)
O(4)-Gd(1)-O(7)	81.47(8)	O(7)-Gd(1)-N(1)	134.76(9)
O(1)-Gd(1)-O(7)	137.58(8)	N(4)-Gd(1)-N(1)	139.10(9)
O(4)-Gd(1)-N(4)	136.53(8)	N(2)-Gd(1)-N(1)	61.68(9)
O(1)-Gd(1)-N(4)	80.46(9)	O(4)-Gd(1)-N(3)	74.36(8)
O(7)-Gd(1)-N(4)	84.20(9)	O(1)-Gd(1)-N(3)	70.62(8)
O(4)-Gd(1)-N(2)	75.43(9)	O(7)-Gd(1)-N(3)	67.23(8)
O(1)-Gd(1)-N(2)	136.36(9)	N(4)-Gd(1)-N(3)	62.25(9)
O(7)-Gd(1)-N(2)	76.26(9)	N(2)-Gd(1)-N(3)	135.22(9)
N(4)-Gd(1)-N(2)	139.43(9)	N(1)-Gd(1)-N(3)	135.29(9)
Complex 3			
Nd(1)-O(4)	2.368(3)	Nd(1)-N(4)	2.678(3)
Nd(1)-O(1)	2.409(3)	Nd(1)-N(3)	2.701(3)
Nd(1)-O(7)	2.467(3)	Nd(1)-N(2)	2.703(4)
Nd(1)-O(1W)	2.510(4)	Nd(1)-N(1)	2.703(3)
Nd(1)-O(2W)	2.543(4)	O(4)-Nd(1)-N(2)	75.91(11)
O(4)-Nd(1)-O(1)	82.50(11)	O(1)-Nd(1)-N(2)	61.04(11)
O(4)-Nd(1)-O(7)	81.82(10)	O(7)-Nd(1)-N(2)	135.92(11)
O(1)-Nd(1)-O(7)	138.12(10)	N(4)-Nd(1)-N(2)	76.15(10)
O(4)-Nd(1)-N(4)	135.92(10)	N(3)-Nd(1)-N(2)	139.97(11)
O(1)-Nd(1)-N(4)	80.27(11)	O(4)-Nd(1)-N(1)	135.76(11)
O(7)-Nd(1)-N(4)	84.60(10)	O(1)-Nd(1)-N(1)	72.58(10)
O(4)-Nd(1)-N(3)	74.84(10)	O(7)-Nd(1)-N(1)	76.04(11)
O(1)-Nd(1)-N(3)	71.02(10)	N(4)-Nd(1)-N(1)	133.98(11)
O(7)-Nd(1)-N(3)	67.45(10)	N(3)-Nd(1)-N(1)	139.51(11)
N(4)-Nd(1)-N(3)	61.22(10)	N(2)-Nd(1)-N(1)	135.97(11)
Complex 4			
Tb(1)-O(4)	2.348(3)	Tb(1)-N(3)	2.675(3)

Tb(1)-O(1)	2.391(3)	Tb(1)-N(1)	2.702(3)
Tb(1)-O(7)	2.449(3)	Tb(1)-N(2)	2.705(3)
Tb(1)-O(1W)	2.486(4)	Tb(1)-N(4)	2.707(3)
Tb(1)-O(2W)	2.532(3)	O(4)-Tb(1)-N(2)	72.75(10)
O(4)-Tb(1)-O(1)	83.20(10)	O(1)-Tb(1)-N(2)	75.84(10)
O(4)-Tb(1)-O(7)	81.28(9)	O(7)-Tb(1)-N(2)	134.71(10)
O(1)-Tb(1)-O(7)	137.50(9)	N(3)-Tb(1)-N(2)	139.05(10)
O(4)-Tb(1)-N(3)	136.70(10)	N(1)-Tb(1)-N(2)	61.87(11)
O(1)-Tb(1)-N(3)	80.41(10)	O(4)-Tb(1)-N(4)	74.39(9)
O(7)-Tb(1)-N(3)	84.37(10)	O(1)-Tb(1)-N(4)	70.39(10)
O(4)-Tb(1)-N(1)	75.29(10)	O(7)-Tb(1)-N(4)	67.37(9)
O(1)-Tb(1)-N(1)	136.48(10)	N(3)-Tb(1)-N(4)	62.38(10)
O(7)-Tb(1)-N(1)	76.13(10)	N(1)-Tb(1)-N(4)	135.24(10)
N(3)-Tb(1)-N(1)	139.37(10)	N(2)-Tb(1)-N(4)	134.93(10)

Table S2. Bond Lengths (Å) and Angles (°) with Standard Deviations of **5-7**

Complex 5 (#1 -x+2,-y+1,-z+1)			
Eu(1)-O(1)	2.268(3)	Eu(1)-N(4)	2.623(4)
Eu(1)-O(1)#1	2.280(3)	Eu(1)-N(1)	2.647(5)
Eu(1)-O(2)	2.397(4)	Eu(1)-N(3)	2.670(4)
Eu(1)-O(1W)	2.455(4)	Eu(1)-N(2)	2.605(4)
O(1)-Eu(1)-O(1)#1	69.31(13)	O(1)#1-Eu(1)-N(1)	128.97(13)
O(1)-Eu(1)-O(2)	138.99(15)	O(2)-Eu(1)-N(1)	73.32(15)
O(1)#1-Eu(1)-O(2)	151.55(16)	N(2)-Eu(1)-N(1)	62.44(15)
O(1)-Eu(1)-N(2)	83.30(13)	N(4)-Eu(1)-N(1)	149.58(14)
O(1)#1-Eu(1)-N(2)	77.78(13)	O(1)-Eu(1)-N(3)	80.34(12)
O(2)-Eu(1)-N(2)	104.31(14)	O(1)#1-Eu(1)-N(3)	116.77(12)
O(1)-Eu(1)-N(4)	110.98(13)	O(2)-Eu(1)-N(3)	74.72(14)
O(1)#1-Eu(1)-N(4)	79.00(12)	N(2)-Eu(1)-N(3)	151.86(15)
O(2)-Eu(1)-N(4)	85.21(14)	N(4)-Eu(1)-N(3)	61.97(13)
N(2)-Eu(1)-N(4)	146.04(14)	N(1)-Eu(1)-N(3)	91.18(14)
Complex 6 (#1 -x+2,-y+1,-z+1)			
Gd(1)-O(1)	2.261(4)	Gd(1)-N(4)	2.612(4)
Gd(1)-O(1)#1	2.268(3)	Gd(1)-N(2)	2.637(5)
Gd(1)-O(2)	2.390(4)	Gd(1)-N(3)	2.649(4)

Gd(1)-O(1W)	2.435(4)	Gd(1)-Gd(1)#1	3.7251(6)
Gd(1)-N(1)	2.587(4)		
O(1)-Gd(1)-O(1)#1	69.35(16)	O(1)#1-Gd(1)-N(2)	129.84(14)
O(1)-Gd(1)-O(2)	139.18(15)	O(2)-Gd(1)-N(2)	73.03(15)
O(1)#1-Gd(1)-O(2)	151.28(16)	N(1)-Gd(1)-N(2)	62.59(15)
O(1)-Gd(1)-N(1)	82.75(14)	N(4)-Gd(1)-N(2)	148.63(14)
O(1)#1-Gd(1)-N(1)	78.21(13)	O(1)-Gd(1)-N(3)	80.28(13)
O(2)-Gd(1)-N(1)	104.60(14)	O(1)#1-Gd(1)-N(3)	116.75(13)
O(1)-Gd(1)-N(4)	111.44(13)	O(2)-Gd(1)-N(3)	74.62(14)
O(1)#1-Gd(1)-N(4)	79.15(13)	N(1)-Gd(1)-N(3)	150.98(15)
O(2)-Gd(1)-N(4)	84.51(14)	N(4)-Gd(1)-N(3)	62.23(13)
N(1)-Gd(1)-N(4)	146.66(14)	N(2)-Gd(1)-N(3)	90.33(14)

Complex 7 (#1 -x+2,-y+1,-z+1)

Tb(1)-O(1)#1	2.247(4)	Tb(1)-N(2)	2.579(4)
Tb(1)-O(1)	2.255(3)	Tb(1)-N(3)	2.602(4)
Tb(1)-O(2)	2.372(4)	Tb(1)-N(1)	2.633(5)
Tb(1)-O(1W)	2.422(4)	Tb(1)-N(4)	2.644(4)
O(1)#1-Tb(1)-O(1)	69.14(15)		
O(1)#1-Tb(1)-O(2)	139.18(16)	O(1)-Tb(1)-N(1)	130.02(14)
O(1)-Tb(1)-O(2)	151.47(17)	O(2)-Tb(1)-N(1)	72.92(16)
O(1)#1-Tb(1)-N(2)	82.97(14)	N(2)-Tb(1)-N(1)	63.18(16)
O(1)-Tb(1)-N(2)	78.15(14)	N(3)-Tb(1)-N(1)	148.33(15)

O(2)-Tb(1)-N(2)	104.68(15)	O(1)#1-Tb(1)-N(4)	80.29(13)
O(1)#1-Tb(1)-N(3)	111.84(14)	O(1)-Tb(1)-N(4)	116.76(13)
O(1)-Tb(1)-N(3)	79.30(14)	O(2)-Tb(1)-N(4)	74.42(15)
O(2)-Tb(1)-N(3)	84.14(15)	N(2)-Tb(1)-N(4)	151.13(16)
N(2)-Tb(1)-N(3)	146.15(16)	N(3)-Tb(1)-N(4)	62.63(14)
O(1)#1-Tb(1)-N(1)	75.53(14)	N(1)-Tb(1)-N(4)	89.83(15)
