

Electronic Supplementary Information (ESI) for

Syntheses, Topologies, and Luminescence of Four Ln-Organic Polymers Constructed From Aromatic Tetracarboxylic Acids

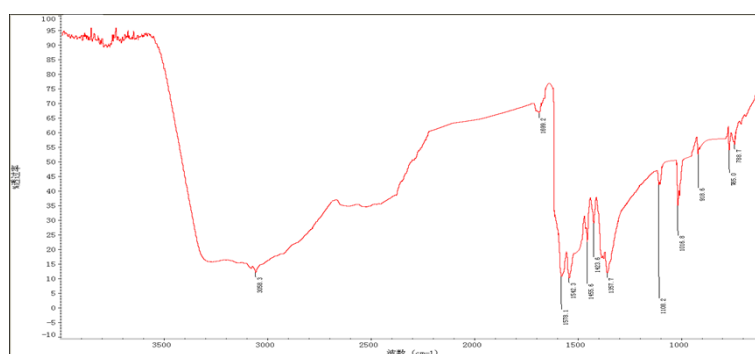
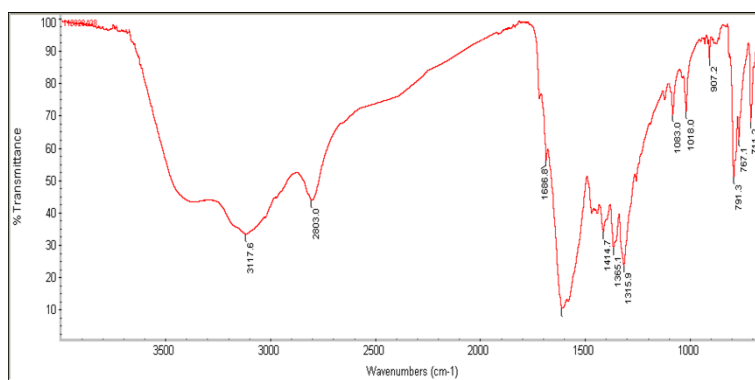
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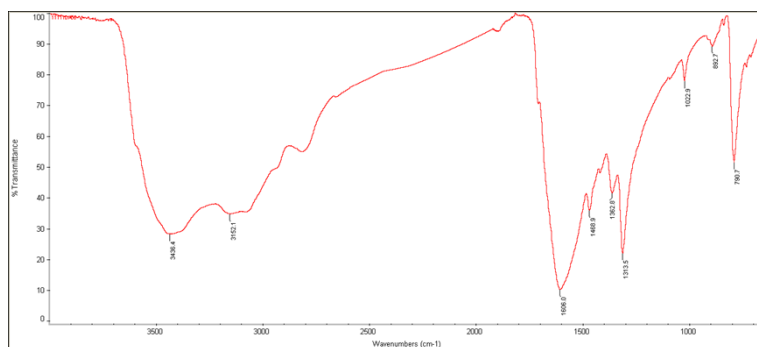
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Research, College of Chemistry and Chemical Engineering, Qilu Normal University, Jinan, 250013, China.

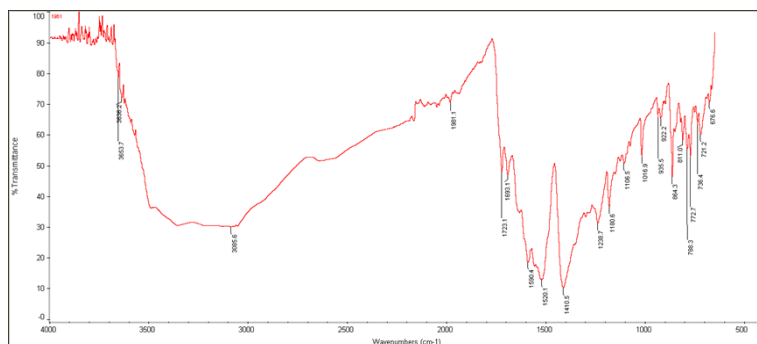
E-mail: xiutangzhang@163.com; zhaoxian@icm.sdu.edu.cn.

ESI



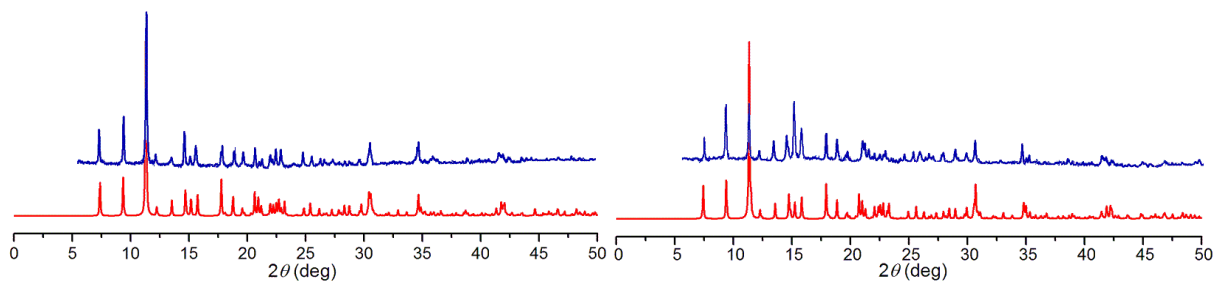


(3)



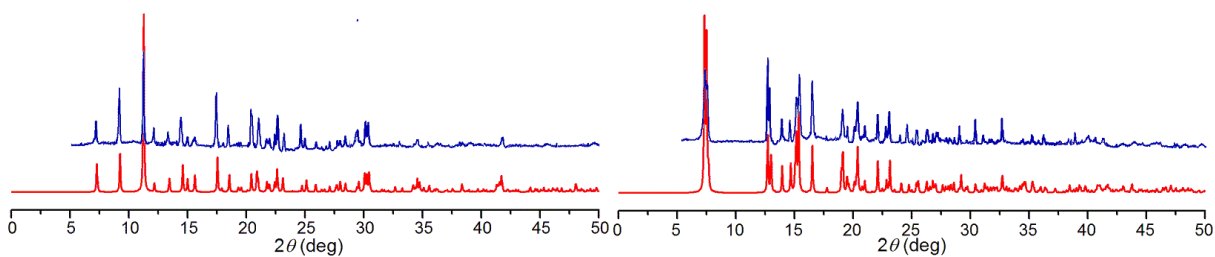
(4)

Figure S1. IR spectra of complexes 1-4.



(1)

(2)



(3)

(4)

Figure S2. PXRD patterns of complexes 1-4. Red: calculated from the X-ray single-crystal data; Blue: observed for the as-synthesized solids.

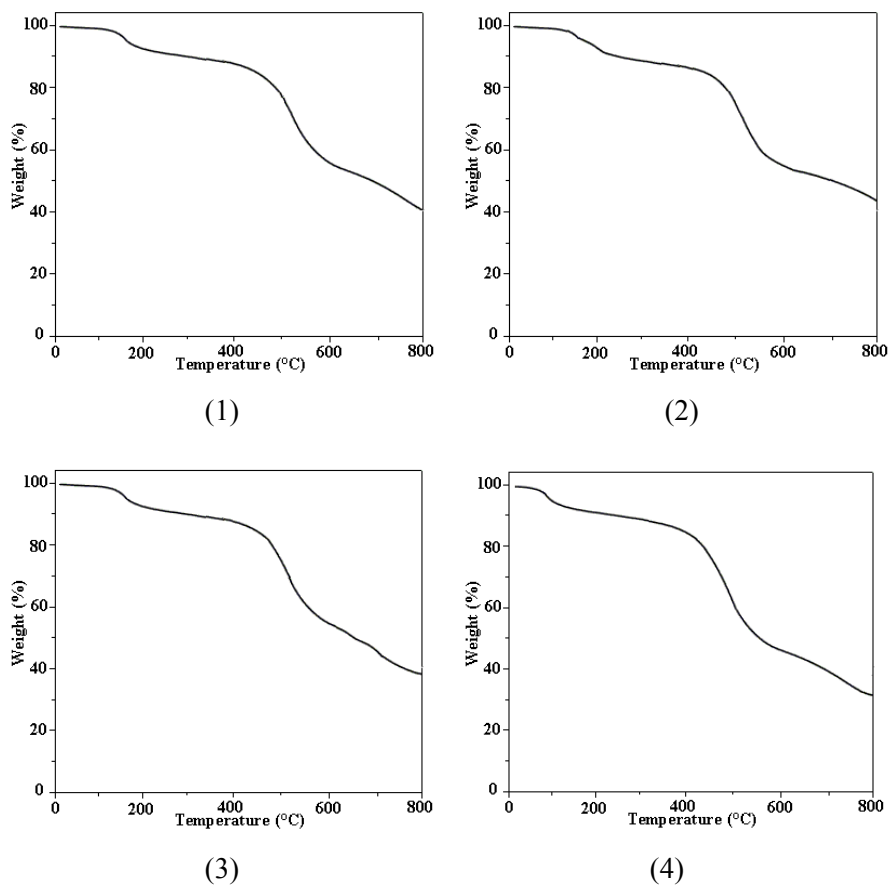


Figure S3. TGA curves for complexes 1-4.

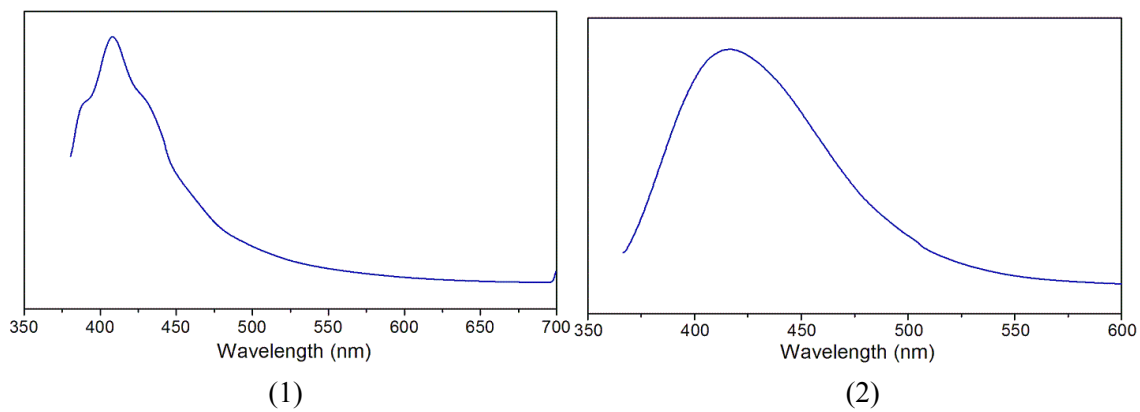


Figure S4. Emissionspectra of two ligands (1 for H₄BPT, 2 for H₄DCP) in the solid state at room temperature.

Table S1 Selected bond lengths (Å) and angles (°) for **1 – 4**.

Complex 1							
Er(1)-O(2)	2.357(5)	Er(1)-O(16)	2.242(4)	Er(1)-O(14) ^{#2}	2.309(4)	Er(1)-O(1)	2.444(4)
Er(1)-O(12) ^{#4}	2.383(4)	Er(1)-O(10) ^{#1}	2.271(5)	Er(1)-O(6) ^{#3}	2.335(4)	Er(1)-O(8) ^{#3}	2.503(5)
Er(2)-O(3)	2.361(4)	Er(2)-O(13) ^{#4}	2.268(4)	Er(2)-O(11) ^{#6}	2.319(4)	Er(2)-O(5)	2.418(4)
Er(2)-O(7)	2.363(4)	Er(2)-O(15) ^{#5}	2.317(4)	Er(2)-O(4)	2.387(5)	Er(2)-O(9)	2.438(4)
O(16)-Er(1)-O(10) ^{#1}	77.95(15)	O(10) ^{#1} -Er(1)-O(2)	144.32(17)	O(2)-Er(1)-O(12) ^{#4}	83.46(15)	O(16)-Er(1)-O(8) ^{#3}	72.20(15)
O(16)-Er(1)-O(14) ^{#2}	117.68(14)	O(14) ^{#2} -Er(1)-O(2)	139.13(15)	O(16)-Er(1)-O(1)	139.24(14)	O(10) ^{#1} -Er(1)-O(8) ^{#3}	76.76(15)
O(10) ^{#1} -Er(1)-O(14) ^{#2}	73.87(16)	O(6) ^{#3} -Er(1)-O(2)	85.60(14)	O(10) ^{#1} -Er(1)-O(1)	138.16(15)	O(14) ^{#2} -Er(1)-O(8) ^{#3}	145.63(14)
O(16)-Er(1)-O(6) ^{#3}	137.65(18)	O(16)-Er(1)-O(12) ^{#4}	73.35(16)	O(14) ^{#2} -Er(1)-O(1)	70.90(14)	O(6) ^{#3} -Er(1)-O(8) ^{#3}	67.62(18)
O(10) ^{#1} -Er(1)-O(6) ^{#3}	80.40(14)	O(10) ^{#1} -Er(1)-O(12) ^{#4}	124.14(16)	O(6) ^{#3} -Er(1)-O(1)	77.80(16)	O(2)-Er(1)-O(8) ^{#3}	67.56(15)
O(14) ^{#2} -Er(1)-O(6) ^{#3}	90.04(16)	O(14) ^{#2} -Er(1)-O(12) ^{#4}	78.68(15)	O(2)-Er(1)-O(1)	68.45(15)	O(12) ^{#4} -Er(1)-O(8) ^{#3}	133.77(16)
O(16)-Er(1)-O(2)	91.26(15)	O(6) ^{#3} -Er(1)-O(12) ^{#4}	147.38(17)	O(12) ^{#4} -Er(1)-O(1)	69.60(15)	O(1)-Er(1)-O(8) ^{#3}	125.03(14)
O(13) ^{#4} -Er(2)-O(15) ^{#5}	123.77(15)	O(15) ^{#5} -Er(2)-O(7)	85.28(17)	O(7)-Er(2)-O(4)	90.31(15)	O(3)-Er(2)-O(5)	124.28(14)
O(13) ^{#4} -Er(2)-O(11) ^{#6}	82.53(15)	O(11) ^{#6} -Er(2)-O(7)	81.23(15)	O(13) ^{#4} -Er(2)-O(5)	73.23(14)	O(7)-Er(2)-O(5)	67.48(18)
O(15) ^{#5} -Er(2)-O(11) ^{#6}	73.25(14)	O(3)-Er(2)-O(7)	77.69(16)	O(15) ^{#5} -Er(2)-O(5)	139.65(13)	O(4)-Er(2)-O(5)	69.90(14)
O(13) ^{#4} -Er(2)-O(3)	132.21(14)	O(13) ^{#4} -Er(2)-O(4)	81.42(15)	O(11) ^{#6} -Er(2)-O(5)	73.59(13)	O(13) ^{#4} -Er(2)-O(9)	71.96(15)
O(15) ^{#5} -Er(2)-O(3)	74.22(14)	O(15) ^{#5} -Er(2)-O(4)	142.22(15)	O(7)-Er(2)-O(9)	146.17(17)	O(15) ^{#5} -Er(2)-O(9)	78.65(15)
O(11) ^{#6} -Er(2)-O(3)	142.35(14)	O(11) ^{#6} -Er(2)-O(4)	142.99(15)	O(4)-Er(2)-O(9)	84.73(14)	O(11) ^{#6} -Er(2)-O(9)	121.14(14)
O(13) ^{#4} -Er(2)-O(7)	140.29(18)	O(3)-Er(2)-O(4)	68.19(16)	O(5)-Er(2)-O(9)	139.37(15)	O(3)-Er(2)-O(9)	69.39(14)
Symmetry codes: #1 x+1/2, -y+1/2, z; #2 -x+1/2, y-1/2, z+1/2; #3 -x, -y, z-1/2; #4 -x, -y+1, z+1/2; #5 x-1/2, -y+1/2, z; #6 -x-1/2, y-1/2, z+1/2.							
Complex 2							
Yb(1)-O(16)	2.209(7)	Yb(1)-O(6) ^{#4}	2.300(6)	Yb(1)-O(1)	2.438(8)	Yb(1)-O(14) ^{#3}	2.285(8)
Yb(1)-O(10) ^{#2}	2.236(8)	Yb(1)-O(2)	2.342(8)	Yb(1)-O(8) ^{#4}	2.498(8)	Yb(1)-O(12) ^{#5}	2.352(7)
Yb(2)-O(13) ^{#5}	2.238(7)	Yb(2)-O(4)	2.368(9)	Yb(2)-O(11) ^{#7}	2.293(8)	Yb(2)-O(3)	2.336(8)
Yb(2)-O(15) ^{#6}	2.287(8)	Yb(2)-O(5)	2.401(8)	Yb(2)-O(7)	2.332(6)	Yb(2)-O(9)	2.415(7)
O(16)-Yb(1)-O(10) ^{#2}	77.1(3)	O(16)-Yb(1)-O(8) ^{#4}	71.7(3)	O(10) ^{#2} -Yb(1)-O(2)	143.8(3)	O(2)-Yb(1)-O(12) ^{#5}	83.7(3)
O(16)-Yb(1)-O(14) ^{#3}	117.2(3)	O(10) ^{#2} -Yb(1)-O(8) ^{#4}	76.4(3)	O(14) ^{#3} -Yb(1)-O(2)	139.5(3)	O(16)-Yb(1)-O(1)	139.9(2)
O(10) ^{#2} -Yb(1)-O(14) ^{#3}	74.3(3)	O(14) ^{#3} -Yb(1)-O(8) ^{#4}	146.0(2)	O(6) ^{#4} -Yb(1)-O(2)	85.7(2)	O(10) ^{#2} -Yb(1)-O(1)	138.1(3)
O(16)-Yb(1)-O(6) ^{#4}	137.5(3)	O(6) ^{#4} -Yb(1)-O(8) ^{#4}	68.1(3)	O(16)-Yb(1)-O(12) ^{#5}	73.5(3)	O(14) ^{#3} -Yb(1)-O(1)	70.5(3)
O(10) ^{#2} -Yb(1)-O(6) ^{#4}	80.7(2)	O(2)-Yb(1)-O(8) ^{#4}	67.4(3)	O(10) ^{#2} -Yb(1)-O(12) ^{#5}	123.9(3)	O(6) ^{#4} -Yb(1)-O(1)	77.7(3)
O(14) ^{#3} -Yb(1)-O(6) ^{#4}	90.4(3)	O(12) ^{#5} -Yb(1)-O(8) ^{#4}	133.5(3)	O(14) ^{#3} -Yb(1)-O(12) ^{#5}	78.4(3)	O(2)-Yb(1)-O(1)	69.3(3)
O(16)-Yb(1)-O(2)	91.4(3)	O(1)-Yb(1)-O(8) ^{#4}	125.8(2)	O(6) ^{#4} -Yb(1)-O(12) ^{#5}	147.5(3)	O(12) ^{#5} -Yb(1)-O(1)	69.8(3)
O(13) ^{#5} -Yb(2)-O(15) ^{#6}	122.7(3)	O(11) ^{#7} -Yb(2)-O(3)	141.9(2)	O(13) ^{#5} -Yb(2)-O(5)	72.9(2)	O(15) ^{#6} -Yb(2)-O(9)	78.0(3)
O(13) ^{#5} -Yb(2)-O(11) ^{#7}	81.8(2)	O(7)-Yb(2)-O(3)	78.1(3)	O(15) ^{#6} -Yb(2)-O(5)	140.0(2)	O(11) ^{#7} -Yb(2)-O(9)	120.5(2)
O(15) ^{#6} -Yb(2)-O(11) ^{#7}	72.7(3)	O(13) ^{#5} -Yb(2)-O(4)	81.9(3)	O(11) ^{#7} -Yb(2)-O(5)	74.0(2)	O(7)-Yb(2)-O(9)	145.9(3)
O(13) ^{#5} -Yb(2)-O(7)	140.7(3)	O(15) ^{#6} -Yb(2)-O(4)	142.9(3)	O(7)-Yb(2)-O(5)	68.4(3)	O(3)-Yb(2)-O(9)	68.9(3)
O(15) ^{#6} -Yb(2)-O(7)	85.0(3)	O(11) ^{#7} -Yb(2)-O(4)	143.0(3)	O(3)-Yb(2)-O(5)	125.2(2)	O(4)-Yb(2)-O(9)	85.4(3)
O(11) ^{#7} -Yb(2)-O(7)	81.1(2)	O(7)-Yb(2)-O(4)	91.0(3)	O(4)-Yb(2)-O(5)	69.5(3)	O(5)-Yb(2)-O(9)	139.5(3)
O(13) ^{#5} -Yb(2)-O(3)	132.8(2)	O(3)-Yb(2)-O(4)	69.1(3)	O(13) ^{#5} -Yb(2)-O(9)	72.4(3)	O(13) ^{#5} -Yb(2)-O(3)	74.0(3)
Symmetry codes: #2 x-1/2, -y+3/2, z; #3 -x+3/2, y+1/2, z-1/2; #4 -x+2, -y+2, z+1/2; #5 -x+2, -y+1, z-1/2; #6 x+1/2, -y+3/2, z; #7 -x+5/2, y+1/2, z-1/2.							
Complex 3							
Sm(1)-O(16)	2.307(4)	Sm(1)-O(14) ^{#2}	2.370(5)	Sm(1)-O(2)	2.434(5)	Sm(1)-O(1)	2.474(5)
Sm(1)-O(10) ^{#1}	2.343(5)	Sm(1)-O(6) ^{#3}	2.399(5)	Sm(1)-O(12) ^{#4}	2.447(4)	Sm(1)-O(8) ^{#3}	2.526(5)
Sm(2)-O(13) ^{#4}	2.339(4)	Sm(2)-O(11) ^{#6}	2.390(4)	Sm(2)-O(7)	2.432(4)	Sm(2)-O(4)	2.456(5)
Sm(2)-O(15) ^{#5}	2.390(4)	Sm(2)-O(3)	2.408(4)	Sm(2)-O(5)	2.454(5)	Sm(2)-O(9)	2.504(4)
O(16)-Sm(1)-O(10) ^{#1}	78.23(17)	O(10) ^{#1} -Sm(1)-O(2)	144.32(18)	O(2)-Sm(1)-O(12) ^{#4}	83.42(17)	O(16)-Sm(1)-O(8) ^{#3}	72.59(16)
O(16)-Sm(1)-O(14) ^{#2}	119.42(16)	O(14) ^{#2} -Sm(1)-O(2)	139.02(15)	O(16)-Sm(1)-O(1)	138.54(16)	O(10) ^{#1} -Sm(1)-O(8) ^{#3}	76.48(16)
O(10) ^{#1} -Sm(1)-O(14) ^{#2}	73.55(17)	O(6) ^{#3} -Sm(1)-O(2)	84.60(16)	O(10) ^{#1} -Sm(1)-O(1)	139.38(16)	O(14) ^{#2} -Sm(1)-O(8) ^{#3}	143.85(14)
O(16)-Sm(1)-O(6) ^{#3}	137.04(18)	O(16)-Sm(1)-O(12) ^{#4}	73.57(17)	O(14) ^{#2} -Sm(1)-O(1)	72.05(15)	O(6) ^{#3} -Sm(1)-O(8) ^{#3}	66.12(18)
O(10) ^{#1} -Sm(1)-O(6) ^{#3}	81.14(16)	O(10) ^{#1} -Sm(1)-O(12) ^{#4}	124.17(17)	O(6) ^{#3} -Sm(1)-O(1)	77.63(16)	O(2)-Sm(1)-O(8) ^{#3}	67.84(16)
O(14) ^{#2} -Sm(1)-O(6) ^{#3}	89.51(16)	O(14) ^{#2} -Sm(1)-O(12) ^{#4}	79.97(17)	O(2)-Sm(1)-O(1)	67.06(15)	O(12) ^{#4} -Sm(1)-O(8) ^{#3}	134.67(17)
O(16)-Sm(1)-O(2)	90.73(17)	O(6) ^{#3} -Sm(1)-O(12) ^{#4}	147.20(17)	O(12) ^{#4} -Sm(1)-O(1)	69.58(16)	O(1)-Sm(1)-O(8) ^{#3}	123.61(14)
O(13) ^{#4} -Sm(2)-O(15) ^{#5}	125.76(15)	O(15) ^{#5} -Sm(2)-O(7)	84.87(18)	O(7)-Sm(2)-O(5)	66.01(18)	O(13) ^{#4} -Sm(2)-O(9)	72.76(15)
O(13) ^{#4} -Sm(2)-O(11) ^{#6}	84.33(15)	O(11) ^{#6} -Sm(2)-O(7)	79.81(15)	O(13) ^{#4} -Sm(2)-O(4)	80.89(15)	O(15) ^{#5} -Sm(2)-O(9)	80.13(15)
O(15) ^{#5} -Sm(2)-O(11) ^{#6}	73.34(14)	O(3)-Sm(2)-O(7)	77.52(16)	O(15) ^{#5} -Sm(2)-O(4)	141.86(15)	O(11) ^{#6} -Sm(2)-O(9)	124.08(15)
O(13) ^{#4} -Sm(2)-O(3)	131.58(15)	O(13) ^{#4} -Sm(2)-O(5)	73.58(16)	O(11) ^{#6} -Sm(2)-O(4)	142.33(16)	O(3)-Sm(2)-O(9)	68.73(15)
O(15) ^{#5} -Sm(2)-O(3)	74.87(15)	O(15) ^{#5} -Sm(2)-O(5)	138.71(14)	O(3)-Sm(2)-O(4)	67.07(17)	O(7)-Sm(2)-O(9)	145.57(16)
O(11) ^{#6} -Sm(2)-O(3)	142.21(15)	O(11) ^{#6} -Sm(2)-O(5)	73.18(14)	O(7)-Sm(2)-O(4)	89.25(16)	O(5)-Sm(2)-O(9)	139.72(15)
O(13) ^{#4} -Sm(2)-O(7)	139.30(18)	O(3)-Sm(2)-O(5)	122.45(15)	O(5)-Sm(2)-O(4)	69.45(16)	O(4)-Sm(2)-O(9)	83.92(15)
Symmetry codes: #1 x+1/2, -y+1/2, z; #2 -x+1/2, y-1/2, z+1/2; #3 -x, -y, z-1/2; #4 -x, -y+1, z+1/2; #5 x-1/2, -y+1/2, z; #6 -x-1/2, y-1/2, z+1/2.							
Complex 4							
Gd(1)-O(1)	2.296(2)	Gd(1)-O(2) ^{#2}	2.315(2)	Gd(1)-O(5) ^{#3}	2.437(2)	Gd(1)-O(8) ^{#4}	2.446(3)
Gd(1)-O(4) ^{#1}	2.314(2)	Gd(1)-O(1W)	2.435(3)	Gd(1)-O(3) ^{#2}	2.445(2)	Gd(1)-O(7) ^{#4}	2.473(2)
O(1)-Gd(1)-O(4) ^{#1}	81.53(10)	O(1)-Gd(1)-O(5) ^{#3}	72.48(10)	O(2) ^{#2} -Gd(1)-O(3) ^{#2}	70.96(8)	O(1W)-Gd(1)-O(8) ^{#4}	90.94(10)
O(1)-Gd(1)-O(2) ^{#2}	83.19(9)	O(4) ^{#1} -Gd(1)-O(5) ^{#3}	130.99(8)	O(1W)-Gd(1)-O(3) ^{#2}	141.12(9)	O(5) ^{#3} -Gd(1)-O(8) ^{#4}	127.52(9)
O(4) ^{#1} -Gd(1)-O(2) ^{#2}	77.18(8)	O(2) ^{#2} -Gd(1)-O(5) ^{#3}	136.98(9)	O(5) ^{#3} -Gd(1)-O(3) ^{#2}	75.48(8)	O(3) ^{#2} -Gd(1)-O(8) ^{#4}	91.75(8)
O(1)-Gd(1)-O(1W)	97.30(10)	O(1W)-Gd(1)-O(5) ^{#3}	72.30(10)	O(1)-Gd(1)-O(8) ^{#4}	159.98(10)	O(1)-Gd(1)-O(7) ^{#4}	146.80(10)
O(4) ^{#1} -Gd(1)-O(1W)	70.71(9)	O(1)-Gd(1)-O(3) ^{#2}	93.16(9)	O(4) ^{#1} -Gd(1)-O(8) ^{#4}	84.06(8)	O(4) ^{#1} -Gd(1)-O(7) ^{#4}	125.38(9)
O(2) ^{#2} -Gd(1)-O(1W)	147.39(9)	O(4) ^{#1} -Gd(1)-O(3) ^{#2}	148.10(8)	O(2) ^{#2} -Gd(1)-O(8) ^{#4}	80.11(9)	O(2) ^{#2} -Gd(1)-O(7) ^{#4}	118.80(9)
O(1W)-Gd(1)-O(7) ^{#4}	77.41(10)	O(5) ^{#3} -Gd(1)-O(7) ^{#4}	74.74(9)	O(3) ^{#2} -Gd(1)-O(7) ^{#4}	73.56(9)	O(8) ^{#4} -Gd(1)-O(7) ^{#4}	52.93(8)
Symmetry code: #1 -x+2, -y-1, -z+2; #2 -x+1, -y-1, -z+2; #3 -x+1, -y, -z+1; #4 x-1, y-1, z.							