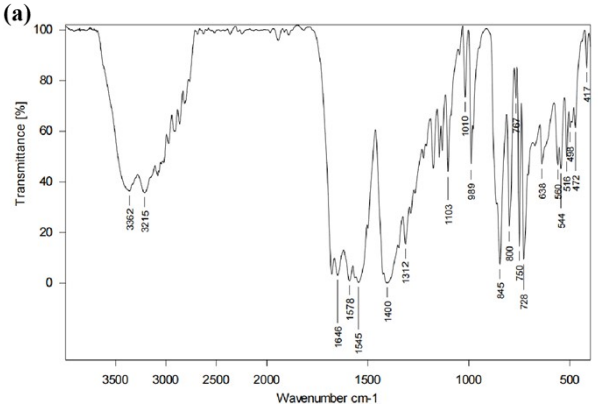
SUPPORTING INFORMATION

1. *Materials and methods*

All reagents were commercially purchased and used without further purification. Powder X-ray diffraction (PXRD) was carried out on a PANalytical X' pert PRO MPD diffractometer with Mo Kα radiation (λ=0.71073Å). Infrared (IR) spectrum using KBr pellets were produced by a Bruker Tensor 37 spectrophotometer. Thermogravimetric analyses (TGA) were carried out using a HCT-2 thermal analyzer with a heating rate of 10℃ min^{-1}. The fluorescence spectrum were recorded on an FL7000 fluorescence spectrophotometer (Japan Hitachi company). The UV−vis spectrum were recorded by U-3900H spectrophotometer (Japan Hitachi company). DFT calculations were performed at the B3LYP/6-311G** level of the Gaussian 09 program.

2. Crystallography

The crystal diffraction data for complexes **1-5** were collected on a Bruker Apex II CCD diffractometer with graphite monochromated Mo Kα radiation at 293(2) K. The SADABS program was used for absorption corrections. The structures were solved by direct methods and refined by the full matrix least squares method on F^2 using the SHELXS 97 and SHELXL 97 programs. All hydrogen atoms were generated geometrically and treated by a mixture of independent and constrained refinements.



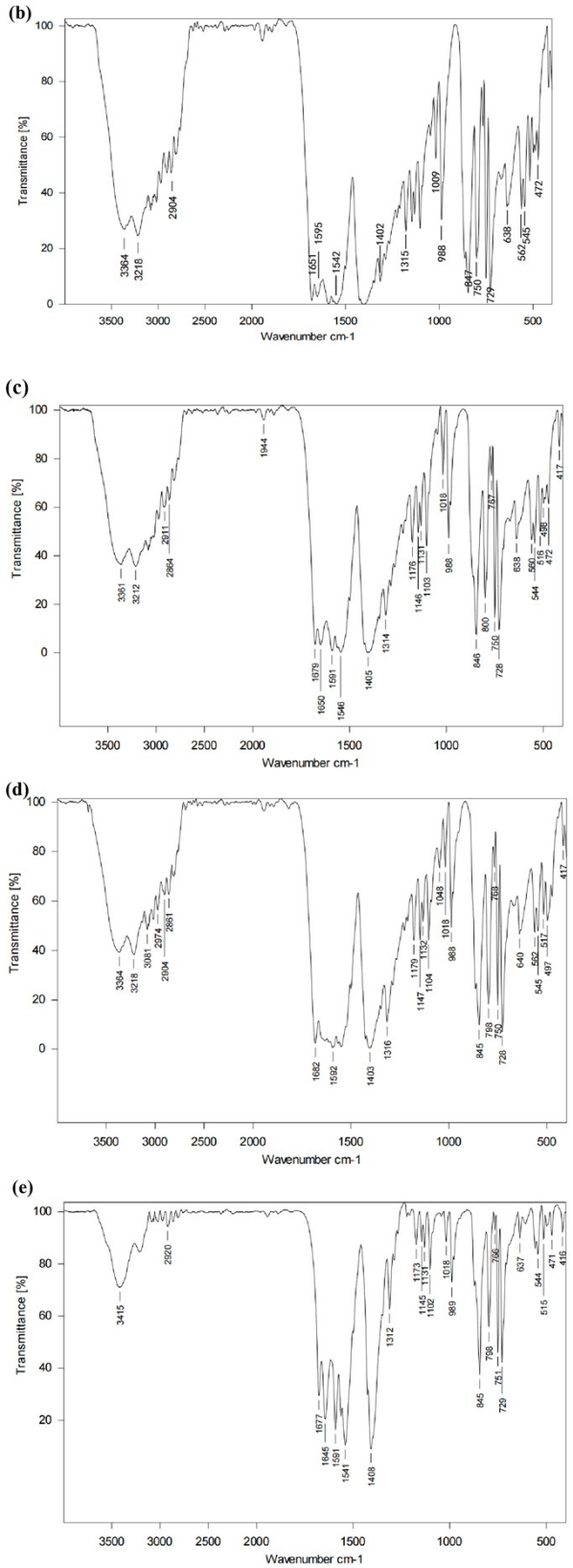


Fig. S1 The IR spectra of the complexes (a) **1** (b) **2** (c) **3** (d) **4** (e) **5**

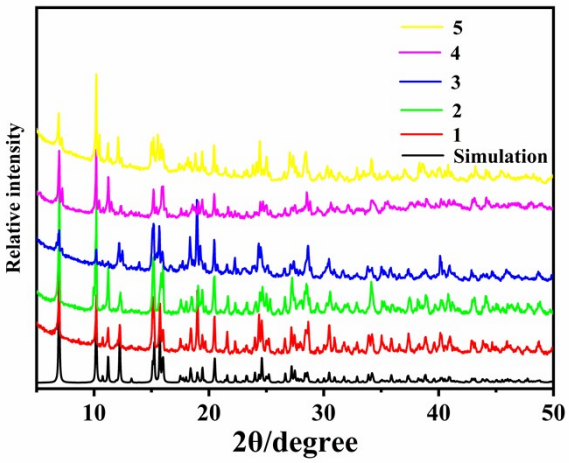
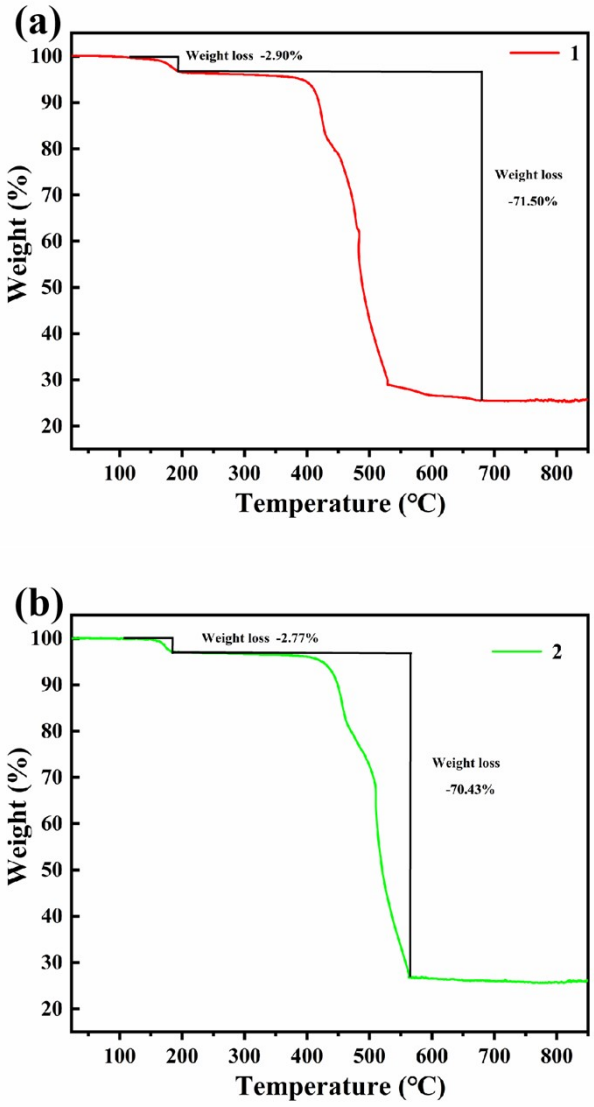


Fig. S2 The PXRD patterns of the complexes **1-5**



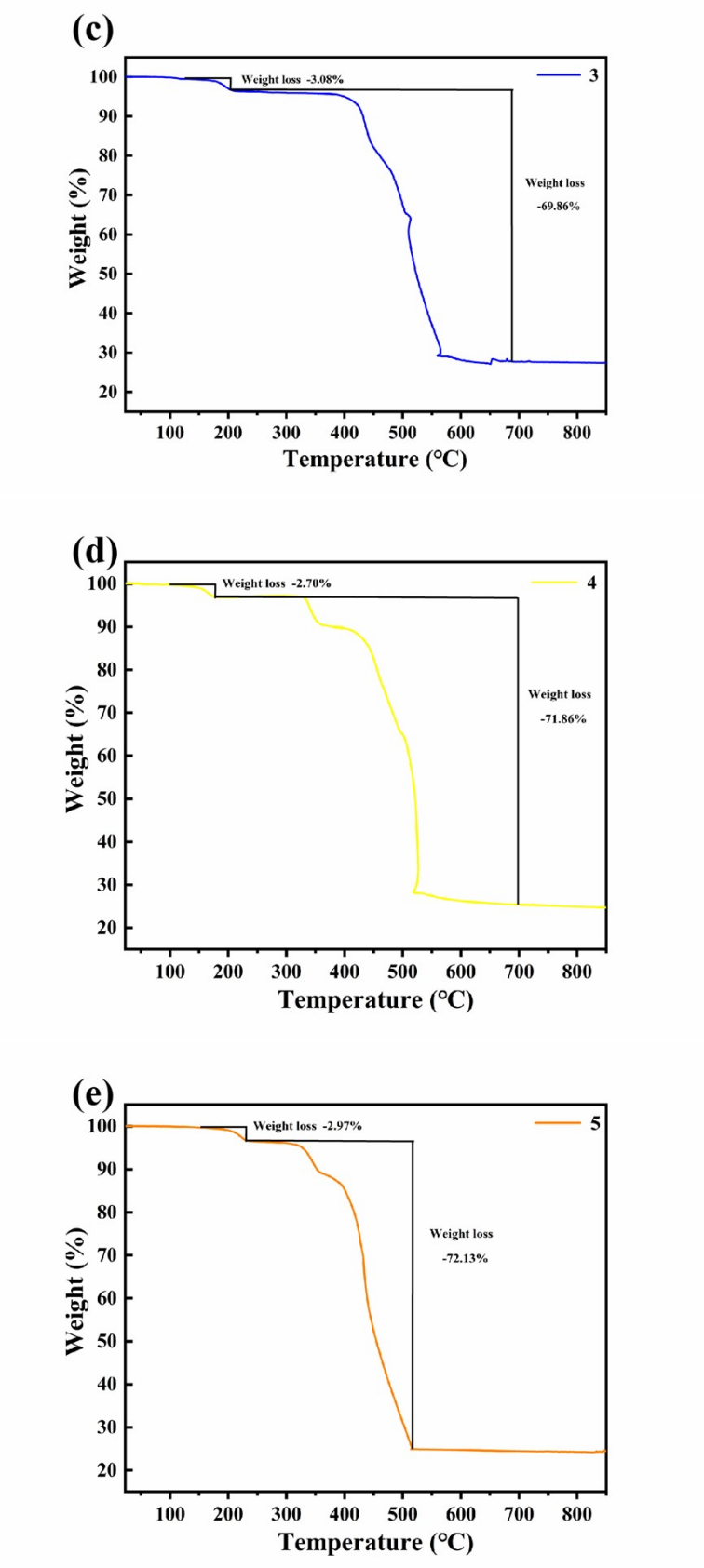


Fig. S3 The TGA curves of (a) **1** (b) **2** (c) **3** (d) **4** (e) **5**

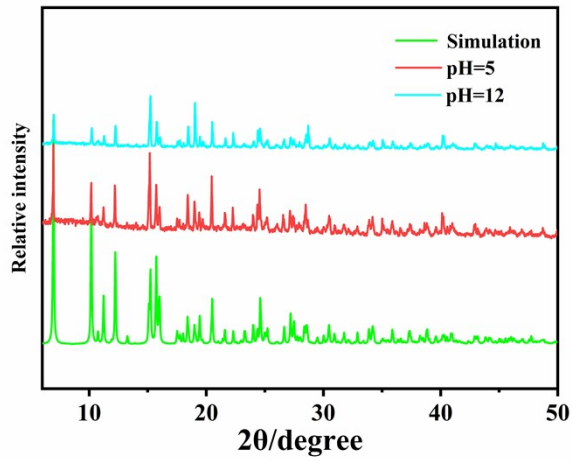


Fig. S4 The PXRD patterns of **1** at different pH solutions

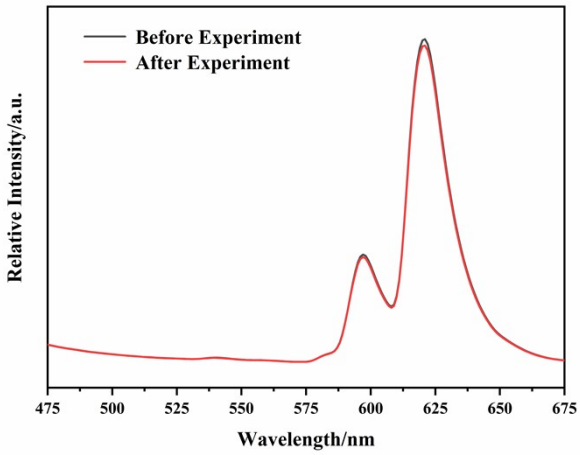


Fig. S5 The luminescence intensity of recovered sample after sensing experiment

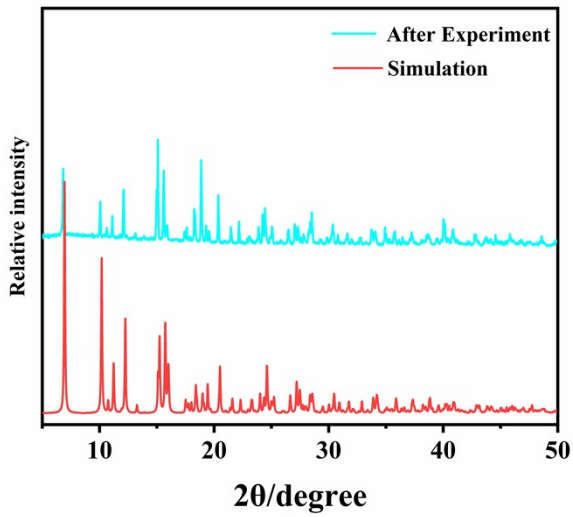


Fig. S6 The PXRD patterns of **1** before and after the experiment

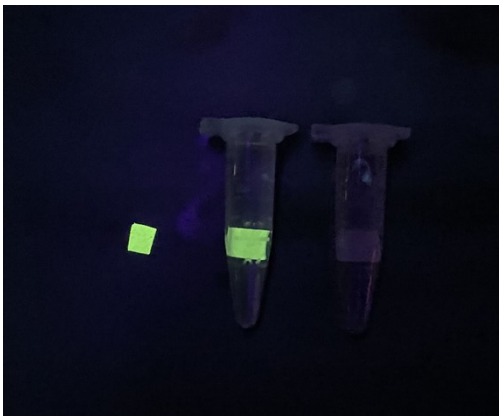


Fig. S7 Film@**2** detection of chlorogenic acid with different concentrations

Table S1 Selected bond lengths [Å] and angles [°] for complexes **1-5**

complex **1**

	Eu(1)-O(4)	2.415(3)	Eu(1)-O(7)A	2.399(3)
	Eu(1)-O(2)B	2.315(3)	Eu(1)-O(5)	2.526(3)
	Eu(1)-O(6)	2.435(3)	Eu(1)-O(1)C	2.376(3)
	Eu(1)-N(4)	2.587(4)	Eu(1)-N(5)	2.566(3)
	O(4)-Eu(1)-O(5)	141.68(11)	O(4)-Eu(1)-O(6)	74.82(10)
	O(4)-Eu(1)-N(4)	80.52(11)	O(4)-Eu(1)-N(5)	109.20(10)
	O(7)A-Eu(1)-O(5)	137.04(11)	O(7)A-Eu(1)-O(4)	79.09(11)
	O(7)A-Eu(1)-N(4)	124.61(10)	O(7)A-Eu(1)-O(6)	67.26(9)
	O(2)B-Eu(1)-O(7)A	140.38(10)	O(7)A-Eu(1)-N(5)	75.55(10)
	O(2)B-Eu(1)-O(6)	74.88(10)	O(2)B-Eu(1)-O(4)	80.21(10)
	O(2)B-Eu(1)-N(4)	84.27(11)	O(2)B-Eu(1)-O(5)	75.27(10)
	O(5)-Eu(1)-N(5)	76.87(10)	O(2)B-Eu(1)-O(1)C	106.20(11)
	O(6)-Eu(1)-O(5)	124.71(9)	O(2)B-Eu(1)-N(5)	143.63(11)
	O(6)-Eu(1)-N(5)	141.20(10)	O(5)-Eu(1)-N(4)	68.23(10)
	O(1)C-Eu(1)-O(4)	146.42(11)	O(1)C-Eu(1)-N(4)	132.36(11)
	O(1)C-Eu(1)-O(5)	69.98(11)	O(6)-Eu(1)-N(4)	149.93(10)
	O(1)C-Eu(1)-O(7)A	75.55(11)	O(1)C-Eu(1)-N(5)	85.40(10)
	O(1)C-Eu(1)-O(6)	75.27(10)	N(5)-Eu(1)-N(4)	63.81(11)

A:-X,-Y,1-Z; B:-X,1-Y,1-Z; C:1+X,-1+Y,+Z; D:-1+X,1+Y,+Z

complex **2**

	Tb(1)-O(4)	2.286(3)	Tb(1)-O(7)	2.499(3)
	Tb(1)-O(6)	2.404(3)	Tb(1)-O(5)A	2.380(3)
	Tb(1)-O(2)B	2.379(3)	Tb(1)-O(3)C	2.345(3)

Tb(1)-N(5)	2.535(4)	Tb(1)-N(4)	2.558(4)
O(4)-Tb(1)-O(7)	75.53(11)	O(4)-Tb(1)-O(6)	74.72(12)
O(4)-Tb(1)-O(5)A	140.90(11)	O(4)-Tb(1)-O(2)B	80.94(12)
O(4)-Tb(1)-O(3)C	106.38(12)	O(4)-Tb(1)-N(5)	144.10(12)
O(4)-Tb(1)-N(4)	83.66(13)	O(7)-Tb(1)-N(5)	77.34(11)
O(7)-Tb(1)-N(4)	68.59(12)	O(6)-Tb(1)-O(7)	125.34(11)
O(6)-Tb(1)-N(5)	141.03(12)	O(6)-Tb(1)-N(4)	148.52(12)
O(5)A-Tb(1)-O(7)	136.95(12)	O(5)A-Tb(1)-O(6)	68.02(10)
O(5)A-Tb(1)-N(5)	74.38(12)	O(5)A-Tb(1)-N(4)	123.96(12)
O(2)B-Tb(1)-O(7)	141.19(12)	O(2)B-Tb(1)-O(6)	75.67(12)
O(2)B-Tb(1)-O(5)A	78.86(12)	O(2)B-Tb(1)-N(5)	107.17(12)
O(2)A-Tb(1)-N(4)	78.59(13)	O(3)C-Tb(1)-O(7)	70.08(12)
O(3)C-Tb(1)-O(6)	75.88(12)	O(3)C-Tb(1)-O(5)A	76.00(12)
O(3)C-Tb(1)-O(2)B	147.41(13)	O(3)C-Tb(1)-N(5)	85.68(11)
O(3)C-Tb(1)-N(4)	133.16(12)	N(5)-Tb(1)-N(4)	64.67(12)

A:1-X,-Y,1-Z; B:1-X,1-Y,1-Z; C:-X,-Y,1-Z

complex **3**

Sm(1)-O(3)A	2.431(3)	Sm(1)-O(5)	2.414(3)
Sm(1)-O(1)	2.335(3)	Sm(1)-O(7)	2.540(3)
Sm(1)-O(6)	2.444(2)	Sm(1)-O(2)B	2.392(3)
Sm(1)-N(5)	2.581(3)	Sm(1)-N(4)	2.601(3)
O(3)A-Sm(1)-O(7)	142.20(10)	O(3)A-Sm(1)-O(6)	74.37(9)
O(3)A-Sm(1)-N(5)	110.22(9)	O(3)A-Sm(1)-N(4)	81.41(10)
O(5)-Sm(1)-O(3)A	79.36(10)	O(5)-Sm(1)-O(7)	136.50(9)
O(5)-Sm(1)-O(6)	66.95(8)	O(5)-Sm(1)-N(5)	75.93(9)
O(5)-Sm(1)-N(4)	124.92(9)	O(1)-Sm(1)-O(3)A	79.65(9)
O(1)-Sm(1)-O(5)	140.10(9)	O(1)-Sm(1)-O(7)	75.78(9)
O(1)-Sm(1)-O(6)	74.88(9)	O(1)-Sm(1)-O(2)B	106.27(10)
O(1)-Sm(1)-N(5)	143.59(10)	O(1)-Sm(1)-N(4)	84.56(10)
O(7)-Sm(1)-N(5)	76.27(9)	O(7)-Sm(1)-N(4)	68.14(9)
O(6)-Sm(1)-O(7)	124.65(8)	O(6)-Sm(1)-N(5)	141.19(9)
O(6)-Sm(1)-N(4)	150.52(9)	O(2)B-Sm(1)-O(3)A	146.17(10)
O(2)B-Sm(1)-O(5)	75.35(9)	O(2)B-Sm(1)-O(7)	69.51(10)
O(2)B-Sm(1)-O(6)	75.24(9)	O(2)B-Sm(1)-N(5)	85.05(9)
O(2)B-Sm(1)-N(4)	131.79(9)	N(5)-Sm(1)-N(4)	63.52(10)

A:-X,2-Y,1-Z; B:1-X,1-Y,1-Z; C:-X,1-Y,1-Z

complex **4**

	Dy(1)-O(1)	2.273(3)	Dy(1)-O(3)A	2.365(3)
	Dy(1)-O(5)	2.394(3)	Dy(1)-O(6)B	2.367(3)
	Dy(1)-O(7)	2.487(3)	Dy(1)-O(2)C	2.335(3)
	Dy(1)-N(2)	2.526(3)	Dy(1)-N(1)	2.544(3)
	O(1)-Dy(1)-O(3)A	81.54(9)	O(1)-Dy(1)-O(5)	74.64(9)
	O(1)-Dy(1)-O(6)B	141.08(9)	O(1)-Dy(1)-O(7)	75.95(9)
	O(1)-Dy(1)-O(2)C	106.24(10)	O(1)-Dy(1)-N(2)	144.06(10)
	O(1)-Dy(1)-N(1)	83.52(10)	O(3)A-Dy(1)-O(5)	75.80(9)
	O(3)A-Dy(1)-O(6)B	78.55(10)	O(3)A-Dy(1)-O(7)	141.16(10)
	O(3)A-Dy(1)-N(2)	106.27(9)	O(3)A-Dy(1)-N(1)	78.12(10)
	O(5)-Dy(1)-O(7)	126.16(9)	O(5)-Dy(1)-N(2)	141.20(9)
	O(5)-Dy(1)-N(1)	148.01(10)	O(6)B-Dy(1)-O(5)	68.23(9)
	O(6)B-Dy(1)-O(7)	136.70(10)	O(6)B-Dy(1)-N(2)	74.20(9)
	O(6)B-Dy(1)-N(1)	123.80(9)	O(7)-Dy(1)-N(2)	76.91(9)
	O(7)-Dy(1)-N(1)	68.31(9)	O(2)C-Dy(1)-O(3)A	147.53(10)
	O(2)C-Dy(1)-O(5)	76.12(9)	O(2)C-Dy(1)-O(6)B	76.15(10)
	O(2)C-Dy(1)-O(7)	70.29(10)	O(2)C-Dy(1)-N(2)	86.04(9)
	O(2)C-Dy(1)-N(1)	133.42(10)	N(2)-Dy(1)-N(1)	64.70(10)

A:-X,-Y,1-Z; B:-X,1-Y,1-Z; C:1-X,1-Y,1-Z

complex **5**

	Ce(1)-O(7)	2.597(3)	Ce(1)-O(5)	2.474(3)
	Ce(1)-O(3)A	2.503(3)	Ce(1)-O(1)	2.399(3)
	Ce(1)-O(6)	2.504(2)	Ce(1)-O(2)B	2.460(3)
	Ce(1)-N(5)	2.657(3)	Ce(1)-N(4)	2.686(3)
	O(7)-Ce(1)-N(5)	76.22(9)	O(7)-Ce(1)-N(4)	67.21(9)
	O(5)-Ce(1)-O(7)	137.03(10)	O(5)-Ce(1)-O(3)A	79.84(10)
	O(5)-Ce(1)-O(6)	65.34(8)	O(5)-Ce(1)-N(5)	77.63(9)
	O(5)-Ce(1)-N(4)	125.73(9)	O(3)A-Ce(1)-O(7)	142.31(10)
	O(3)A-Ce(1)-O(6)	73.02(9)	O(3)A-Ce(1)-N(5)	113.65(9)
	O(3)A-Ce(1)-N(4)	85.31(10)	O(1)-Ce(1)-O(7)	74.63(9)
	O(1)-Ce(1)-O(5)	139.23(9)	O(1)-Ce(1)-O(3)A	78.47(9)
	O(1)-Ce(1)-O(6)	75.45(9)	O(1)-Ce(1)-O(2)B	106.19(10)
	O(1)-Ce(1)-N(5)	142.99(10)	O(1)-Ce(1)-N(4)	86.28(10)
	O(6)-Ce(1)-O(7)	123.43(8)	O(6)-Ce(1)-N(5)	140.85(9)
	O(6)-Ce(1)-N(4)	153.90(9)	O(2)B-Ce(1)-O(7)	69.68(10)
	O(2)B-Ce(1)-O(5)	74.28(10)	O(2)B-Ce(1)-O(3)A	144.51(10)
	O(2)B-Ce(1)-N(4)	129.66(9)	N(5)-Ce(1)-N(4)	61.47(10)
	O(2)B-Ce(1)-O(6)	74.29(9)	O(2)B-Ce(1)-N(5)	84.19(9)

A:1-X,-Y,1-Z; B:-X,1-Y,1-Z; C:1-X,1-Y,1-Z