Electronic Supporting Information:

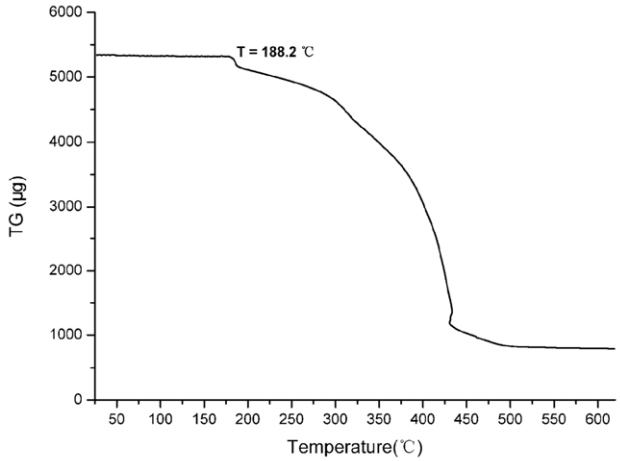


Fig. S1 TGA diagrams representing the behaviour of coordination polymer of $L^I$ upon gradual heating.

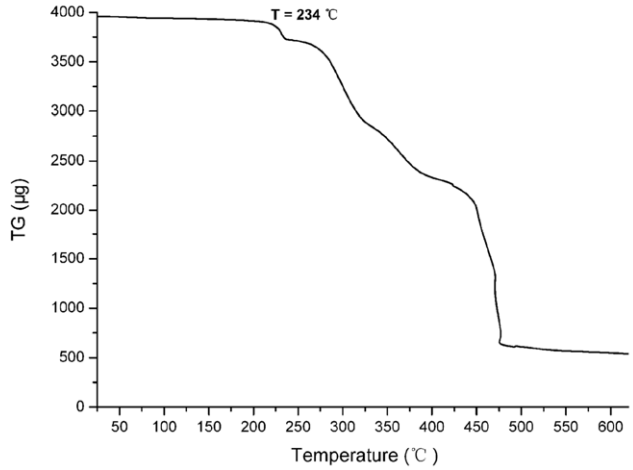


Fig. S1 TGA diagrams representing the behaviour of coordination polymer of $L^I$ upon gradual heating.

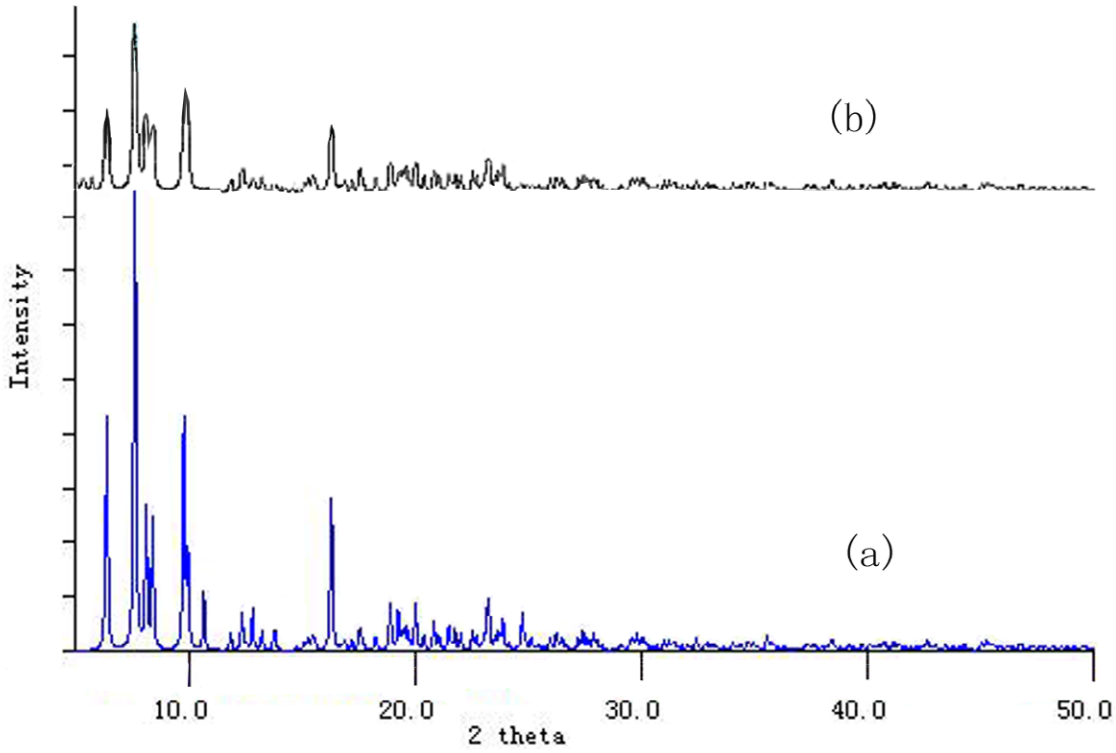


Fig. S3 XRD patterns of lanthanide complex of ligand $L^{I}$ (a) simulated for **1**; (b) as-synthesized of Tb complex of ligand $L^{I}$.

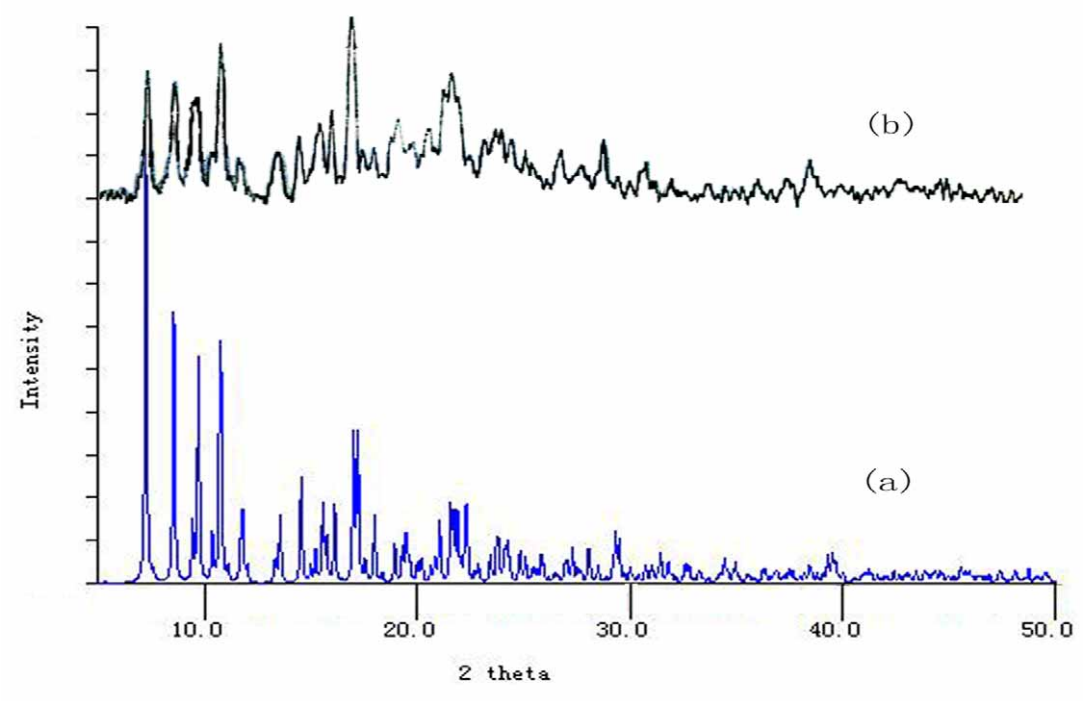


Fig. S4 XRD patterns of lanthanide complex of ligand $L^{II}$ (a) simulated for **2**; (b) as-synthesized of Tb complex of ligand $L^{II}$.

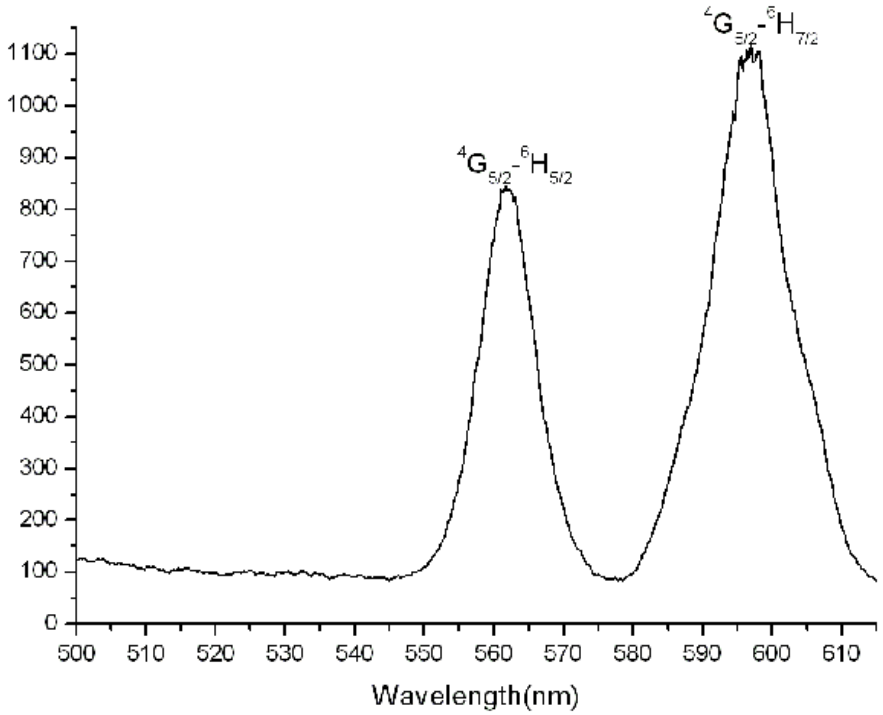


Fig. S5 Room-temperature emission spectra of $Sm^{III}$ complex excited at 317 nm.(excitation and emission passes = 2.5 nm),

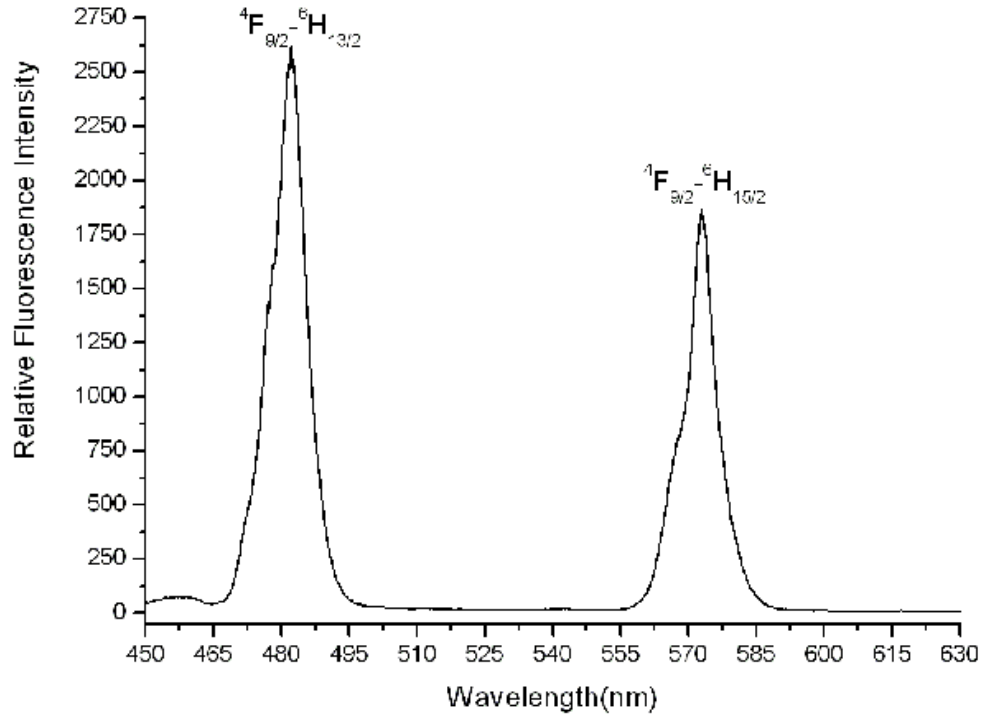


Fig. S6 Room-temperature emission spectra of $Dy^{III}$ complex excited at 322 nm.(excitation and emission passes = 2.5 nm),

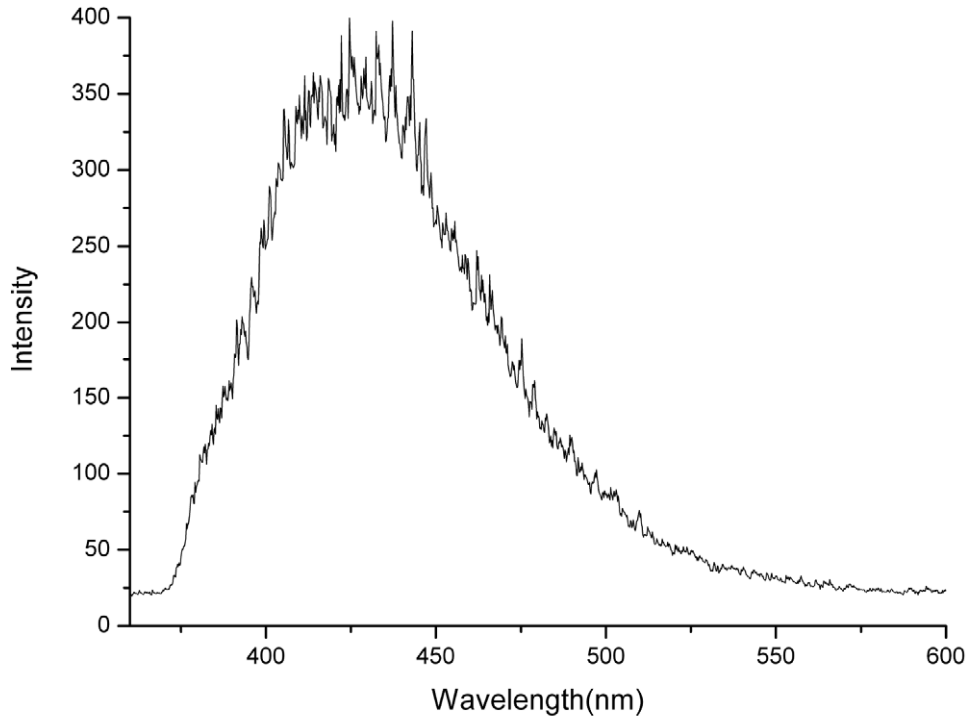


Fig. S7 Phosphorescence spectra of Gd complex of ligand $L^{I}$ excited at 307 nm.at 77K

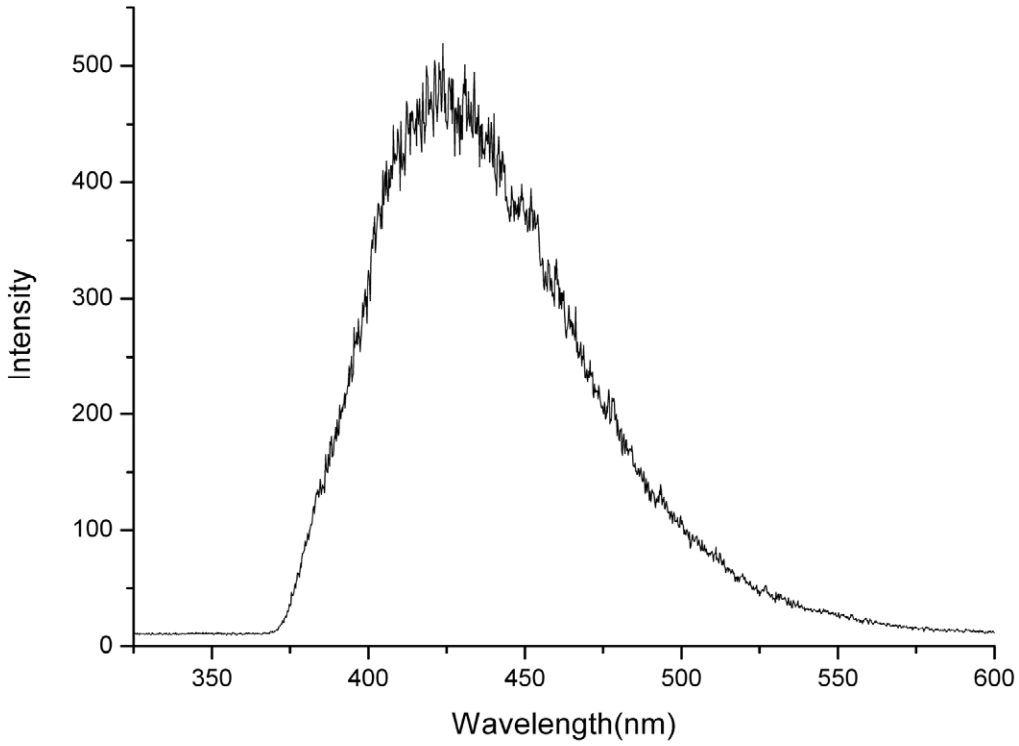


Fig. S8 Phosphorescence spectra of Gd complex of ligand $L^{II}$ excited at 301 nm.at 77K

**Table S1.** Selected bond distances (Å) and angles (°) for polymer **1**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pr(1)-O(5) | 2.398(5) | Pr(1)-O(2) | 2.399(5) | Pr(1)-O(8) | 2.410(6) | Pr(1)-O(11) | 2.531(7) |
| Pr(1)-O(14) | 2.536(7) | Pr(1)-O(10) | 2.552(7) | Pr(1)-O(13) | 2.555(7) | Pr(1)-O(16) | 2.583(7) |
| Pr(1)-O(17) | 2.584(7) | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| O(5)-Pr(1)-O(2) | 151.3(2) | O(5)-Pr(1)-O(8) | 85.8(2) | O(2)-Pr(1)-O(8) | 77.1(2) |
| O(5)-Pr(1)-O(11) | 76.5(2) | O(2)-Pr(1)-O(11) | 96.2(2) | O(8)-Pr(1)-O(11) | 128.3(2) |
| O(5)-Pr(1)-O(14) | 119.9(2) | O(2)-Pr(1)-O(14) | 81.5(2) | O(8)-Pr(1)-O(14) | 84.3(2) |
| O(11)-Pr(1)-O(14) | 146.2(3) | O(5)-Pr(1)-O(10) | 76.0(2) | O(2)-Pr(1)-O(10) | 78.2(2) |
| O(8)-Pr(1)-O(10) | 78.9(2) | O(11)-Pr(1)-O(10) | 49.9(3) | O(14)-Pr(1)-O(10) | 156.1(3) |
| O(5)-Pr(1)-O(13) | 70.5(2) | O(2)-Pr(1)-O(13) | 128.3(2) | O(8)-Pr(1)-O(13) | 82.2(2) |
| O(11)-Pr(1)-O(13) | 132.8(2) | O(14)-Pr(1)-O(13) | 49.5(2) | O(10)-Pr(1)-O(13) | 142.4(2) |
| O(5)-Pr(1)-O(16) | 84.7(2) | O(2)-Pr(1)-O(16) | 119.7(2) | O(8)-Pr(1)-O(16) | 155.0(2) |
| O(11)-Pr(1)-O(16) | 71.3(3) | O(14)-Pr(1)-O(16) | 80.5(3) | O(10)-Pr(1)-O(16) | 120.7(3) |
| O(13)-Pr(1)-O(16) | 72.9(3) | O(5)-Pr(1)-O(17) | 130.4(2) | O(2)-Pr(1)-O(17) | 70.6(2) |
| O(8)-Pr(1)-O(17) | 143.7(2) | O(11)-Pr(1)-O(17) | 72.4(3) | O(14)-Pr(1)-O(17) | 75.1(3) |
| O(10)-Pr(1)-O(17) | 109.3(3) | O(13)-Pr(1)-O(17) | 105.1(3) | O(16)-Pr(1)-O(17) | 49.3(2) |

**Table S2.** Selected bond distances (Å) and angles (°) for polymer **2**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Nd(1)-O(4) | 2.381(7) | Nd(1)-O(8)#1 | 2.391(8) | Nd(1)-O(6) | 2.391(8) | Nd(1)-O(16) | 2.494(9) |
| Nd(1)-O(10) | 2.521(9) | Nd(1)-O(11) | 2.523(10) | Nd(1)-O(17) | 2.528(9) | Nd(1)-O(13) | 2.546(8) |
| Nd(1)-O(14) | 2.564(7) | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| O(4)-Nd(1)-O(8)#1 | 81.9(3) | O(4)-Nd(1)-O(6) | 82.9(3) | O(8)#1-Nd(1)-O(6) | 84.0(3) |
| O(4)-Nd(1)-O(16) | 148.9(3) | O(8)#1-Nd(1)-O(16) | 82.9(3) | O(6)-Nd(1)-O(16) | 122.1(3) |
| O(4)-Nd(1)-O(10) | 75.1(3) | O(8)#1-Nd(1)-O(10) | 154.4(3) | O(6)-Nd(1)-O(10) | 82.3(3) |
| O(16)-Nd(1)-O(10) | 122.7(4) | O(4)-Nd(1)-O(11) | 125.1(3) | O(8)#1-Nd(1)-O(11) | 150.8(3) |
| O(6)-Nd(1)-O(11) | 88.2(3) | O(16)-Nd(1)-O(11) | 77.6(4) | O(10)-Nd(1)-O(11) | 49.9(4) |
| O(4)-Nd(1)-O(17) | 149.5(3) | O(8)#1-Nd(1)-O(17) | 80.5(3) | O(6)-Nd(1)-O(17) | 70.7(3) |
| O(16)-Nd(1)-O(17) | 51.6(4) | O(10)-Nd(1)-O(17) | 114.6(3) | O(11)-Nd(1)-O(17) | 70.3(4) |
| O(4)-Nd(1)-O(13) | 88.8(3) | O(8)#1-Nd(1)-O(13) | 121.5(3) | O(6)-Nd(1)-O(13) | 151.8(3) |
| O(16)-Nd(1)-O(13) | 76.6(3) | O(10)-Nd(1)-O(13) | 69.6(3) | O(11)-Nd(1)-O(13) | 74.7(3) |
| O(17)-Nd(1)-O(13) | 121.7(3) | O(4)-Nd(1)-O(14) | 78.6(2) | O(8)#1-Nd(1)-O(14) | 72.3(2) |
| O(6)-Nd(1)-O(14) | 151.6(3) | O(16)-Nd(1)-O(14) | 71.1(3) | O(10)-Nd(1)-O(14) | 113.0(3) |
| O(11)-Nd(1)-O(14) | 120.1(3) | O(17)-Nd(1)-O(14) | 118.8(3) | O(13)-Nd(1)-O(14) | 49.3(3) |

Symmetry transformations used to generate equivalent atoms: #1: x,-y+1/2,z-1/2

**Table S3.** Selected bond distances (Å) and angles (°) for polymer **3**

| | | | |
|---|---|---|---|
| Sm(1)-O(1) 2.562(8) | Sm(1) -O(2) 2.565(6) | Sm(1)-O(4)#4 2.369(9) | Sm(1) -O(6) 2.527(8) |
| Sm(1)-O(10) 2.491(10) | Sm(1)-O(11) 2.516(8) | Sm(1)-O(12) 2.519(9) | Sm(1) -O(13) 2.349(6) |
| Sm(1)-O(15)#3 12.348(8) | | | |

| | | |
|---|---|---|
| O(15)#3-Sm(1)-O(13) 83.4(2) | O(15)#3-Sm(1)-O(4)#4 82.9(3) | O(13)-Sm(1)-O(2) 78.5(2) |
| O(13)-Sm(1)-O(4)#4 83.3(2) | O(15) #3-Sm(1)-O(10) 153.2(3) | O(13)-Sm(1)-O(10) 72.3(3) |
| O(4)#4--Sm(1)-O(10) 83.2(3) | O(15)#3-Sm(1)-O(11) 83.1(3) | O(13)-Sm(1)-O(11) 148.8(3) |
| O(4)#4-Sm(1)-O(11) 122.6(3) | O(10)-Sm(1)-O(11) 123.7(4) | O(15)#3-Sm(1)-O(12) 79.7(3) |
| O(13)-Sm(1)-O(12) 151.8(4) | O(4)#4-Sm(1)-O(12) 72.3(3) | O(10)-Sm(1)-O(12) 117.3(3) |
| O(11)-Sm(1)-O(12) 50.4(4) | O(15)#3-Sm(1)-O(6) 152.3(3) | O(13)-Sm(1)-O(6) 122.1(3) |
| O(4)#4-Sm(1)-O(6) 89.2(3) | O(10)-Sm(1)-O(6) 49.8(4) | O(11)-Sm(1)-O(6) 79.0(3) |
| O(12)-Sm(1)-O(6) 72.6(4) | O(15) #3-Sm(1)-O(1) 122.5(2) | O(13)-Sm(1)-O(1) 87.3(2) |
| O(4))#4-Sm(1)-O(1) 151.8(2) | O(10)-Sm(1)-O(1) 68.6(3) | O(11)-Sm(1)-O(1) 76.6(3) |
| O(12)-Sm(1)-O(1) 120.8(3) | O(6)-Sm(1)-O(1) 73.4(3) | O(15)#3-Sm(1)-O(2) 71.5(2) |
| O(4)#4-Sm(1)-O(2) 149.9(3) | O(10)-Sm(1)-O(2) 113.1(3) | O(11)-Sm(1)-O(2) 70.6(3) |
| O(12)-Sm(1)-O(2) 116.6(3) | O(6)-Sm(1)-O(2) 120.8(3) | O(1)-Sm(1)-O(2) 51.0(2) |

Symmetry transformations used to generate equivalent atoms:

#1: -x+2,y-1/2,-z+1/2, #2: x,-y+3/2,z+1/2, #3: x,-y+3/2,z-1/2, #4: -x+2,y+1/2,-z+1/2.