Supplementary Material (ESI) for Dalton Transactions


Electronic Supplementary Information (ESI)

# Lanthanide Radii Controlled One-Dimensional Coordination Polymers Structure and Fluorescent Properties

Table S1. Selected Bond Lengths (Å) for Complexes 1-6[a]

| | | | |
|---|---|---|---|
| | | Complex 1 | |
| Ce(1)-O(4)#1 | 2.491(3) | Ce(1)-O(10)#3 | 2.5516(10) |
| Ce(1)-O(4)#2 | 2.491(3) | Ce(1)-O(10) | 2.5516(10) |
| Ce(1)-O(8A) | 2.50(5) | Ce(1)-O(7) | 2.588(3) |
| Ce(1)-O(8A)#3 | 2.50(5) | Ce(1)-O(7)#3 | 2.588(3) |
| Ce(1)-O(1) | 2.504(3) | Ce(1)-O(8B) | 2.73(4) |
| Ce(1)-O(1)#3 | 2.504(3) | Ce(1)-O(8B)#3 | 2.73(4) |
| | | Complex 2 | |
| Nd(1)-O(16) | 2.364(2) | Nd(1)-O(11) | 2.527(3) |
| Nd(1)-O(4)#1 | 2.406(2) | Nd(1)-O(8) | 2.531(3) |
| Nd(1)-O(1) | 2.413(2) | Nd(1)-O(14) | 2.537(3) |
| Nd(1)-O(13) | 2.514(3) | Nd(1)-O(10) | 2.551(3) |
| Nd(1)-O(7) | 2.527(3) | | |
| | | Complex 3 | |
| Sm(1)-O(7) | 2.337(4) | Sm(1)-O(10) | 2.506(5) |
| Sm(1)-O(1) | 2.341(4) | Sm(1)-O(14) | 2.508(5) |
| Sm(1)-O(4)#1 | 2.382(4) | Sm(1)-O(13) | 2.524(5) |
| Sm(1)-O(16) | 2.479(5) | Sm(1)-O(18) | 2.539(4) |
| Sm(1)-O(12) | 2.503(4) | | |
| | | Complex 4 | |
| Eu(1)-O(7) | 2.322(6) | Eu(1)-O(11) | 2.495(7) |
| Eu(1)-O(1) | 2.371(5) | Eu(1)-O(18) | 2.505(5) |
| Eu(1)-O(4)#1 | 2.396(5) | Eu(1)-O(12) | 2.508(6) |
| Eu(1)-O(17) | 2.482(5) | Eu(1)-O(14) | 2.508(6) |
| Eu(1)-O(15) | 2.494(5) | | |
| | | Complex 5 | |
| Dy(1)-O(4) | 2.263(4) | Dy(1)-O(12) | 2.463(5) |
| Dy(1)-O(1) | 2.284(5) | Dy(1)-O(11) | 2.476(5) |
| Dy(1)-O(7) | 2.323(5) | Dy(1)-O(9) | 2.477(5) |
| Dy(1)-O(15) | 2.388(5) | Dy(1)-O(14) | 2.480(5) |
| Dy(1)-O(8) | 2.457(6) | | |
| | | Complex 6 | |
| Er(1)-O(7) | 2.238(4) | Er(1)-O(10) | 2.454(5) |
| Er(1)-O(4) | 2.243(4) | Er(1)-O(15) | 2.462(5) |
| Er(1)-O(19) | 2.338(5) | Er(1)-O(16) | 2.469(5) |
| Er(1)-O(11) | 2.406(5) | Er(1)-O(13) | 2.478(4) |
| Er(1)-O(18) | 2.406(5) | | |

[a] Symmetry codes for 1: #1-x+1,-y,-z, #2 x,-y,z-1/2, #3 -x+1,y,-z-1/2. 2: #1 -x+1,-y,-z. 3: #1 -x,-y,-z+1. 4: #1 -x+1,-y+1,-z+2. 5:

FigureS1. Perspective view of the coordination environment of the complexes 1-6.

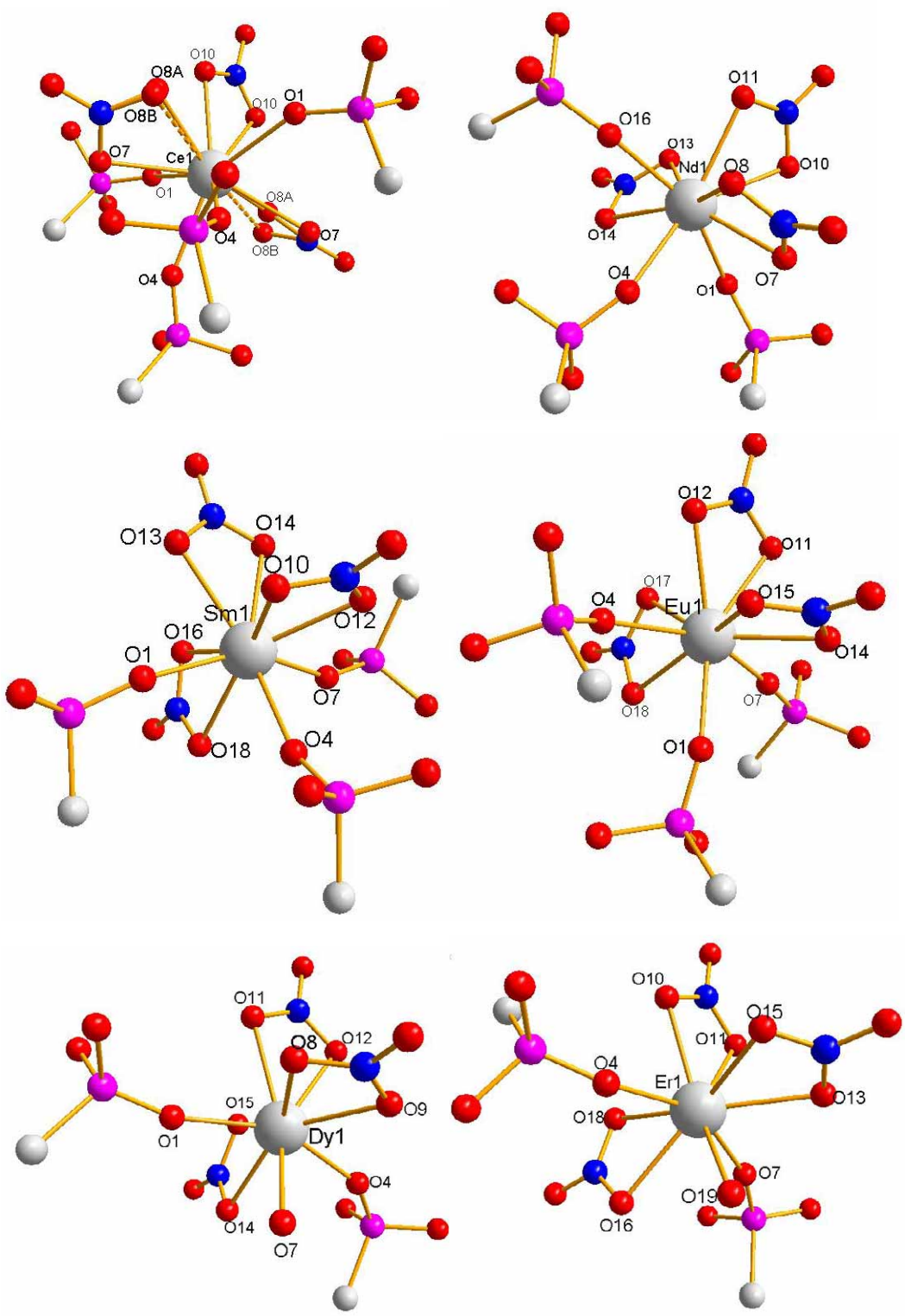

Table S2. Hydrogen Bonding Parameters (Å and °) of 5 and 6.

| D−H···A | D−H | H···A | D···A | ∠D−H···A |
|---|---|---|---|---|
| | | 5 | | |
| O(7)−H···O(13a) | 0.89 | 1.93 | 2.815(8) | 170 |
| O(7)−H···O(10b) | 0.78 | 2.14 | 2.837(9) | 148 |
| | | 6 | | |
| O(19)−H···O(14a) | 0.86 | 2.17 | 2.906(7) | 143 |
| O(19)−H···O(1b) | 0.86 | 2.06 | 2.635(6) | 123 |

[a] Symmetry code, 5: a, x-1, y, z ; b, -x, -y+1, -z. 6 : a, -x+1, -y+1, -z+1; b, -x+1, -y+1, -z

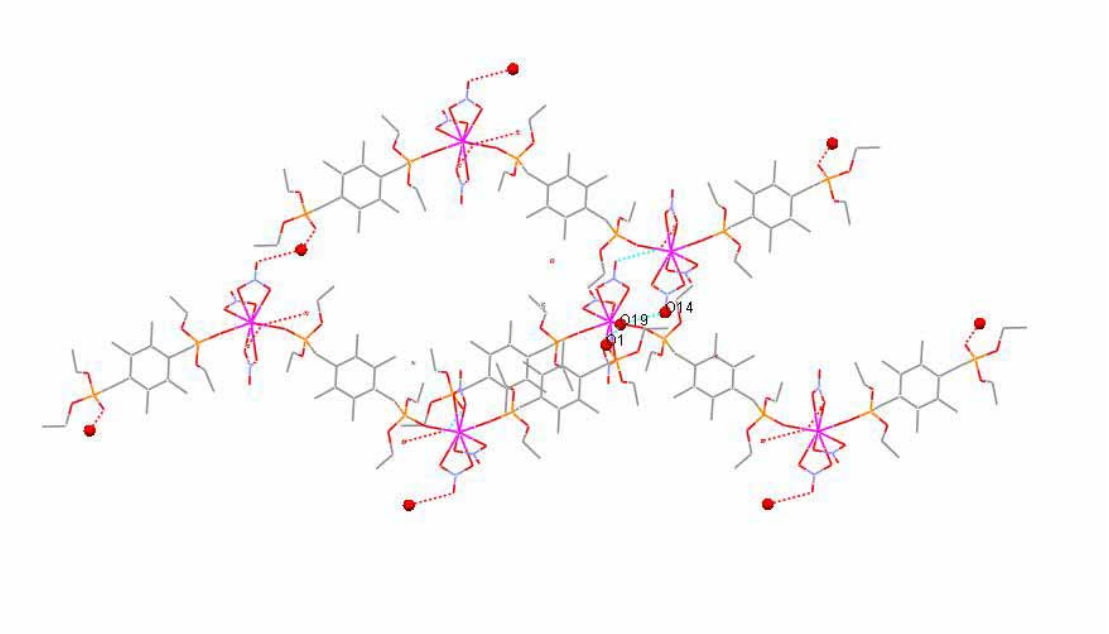


Figure S2. Hydrogen Bonding in complex 6

The elemental analysis and IR datas of $Tb^{3+}$ complex

Anal. Calcd for $[Tb(NO_3)_3LH_2O]_n$ : C, 30.12; H, 4.80; N, 5.27%. Found: C, 30.01; H, 4.68; N, 5.21%.

IR (KBr, $cm^{-1}$): 3422(m), 2986(m), 2934(m), 1739(w), 1624(w), 1492(s), 1387(m), 1307(m), 1229(m), 1171(s), 1028(s), 976(m), 811(w), 795(w), 741(w), 661(w), 587(w), 500(w).

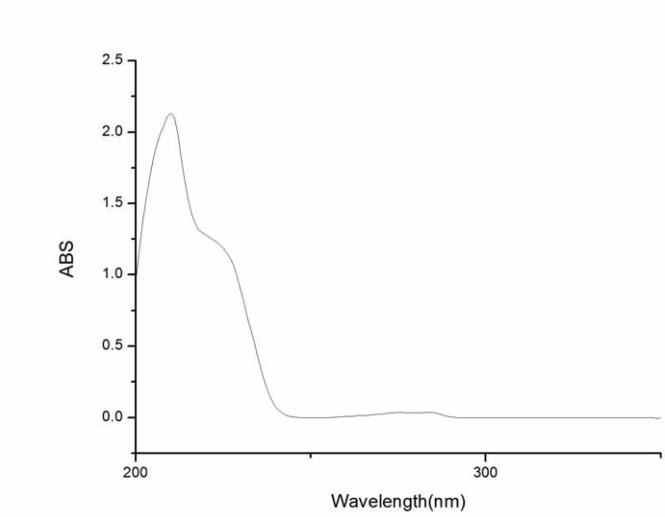


Figure S3. The absorption spectra of the ligand in ethyl acetate ($1 \times 10^{-4}$ M).

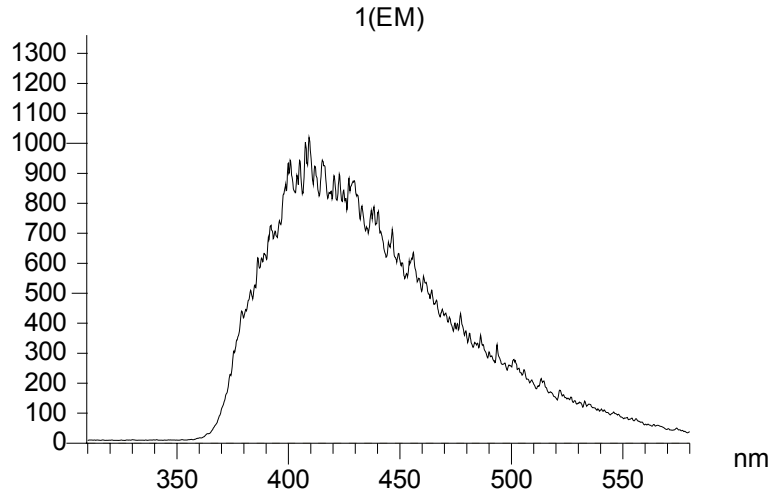


Figure S4. Phosphorescence spectrum of $Gd^{3+}$ complex of the ligand excited at 294 nm at 77K.