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Two- and Three-Dimensional Networks of Lanthanide with Mixed Dicarboxylate Ligands: Syntheses, Crystal Structures and Photoluminescent Properties

Qing-Feng Yang,[a] Yang Yu,[a] Tian-You Song,[a] Jie-Hui Yu,[a] Xiao Zhang,[b] Ji-Qing Xu*[a] and Tie-Gang Wang[a]

[a] *College of Chemistry and State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, Jilin University, Changchun, Jilin, 130021, China. Fax: +86-431-85168624; Tel: +86-431-88499132; E-mail: xjq@mail.jlu.edu.cn*

[b] *Academy of Fundamental and Interdisciplinary Sciences, Harbin Institute Technology, Harbin, Heilongjiang, 150080, China.*

Table. S1 Selected bond lengths (Å) for **1-10**.

1					
Ce(1)–O(1)	2.4771(16)	Ce(1)–O(3)#4	2.5677(15)	Ce(1)–O(6)#3	2.5268(15)
Ce(1)–O(1)#1	2.6573(13)	Ce(1)–O(4)#4	2.5474(15)	Ce(1)–O(7)	2.4772(16)
Ce(1)–O(2)#1	2.5660(14)	Ce(1)–O(5)	2.5008(16)	Ce(1)–O(8)	2.5070(15)
2					
Pr(1)–O(1)	2.516(2)	Pr(1)–O(4)#1	2.633(2)	Pr(1)–O(6)#2	2.481(2)
Pr(1)–O(2)	2.546(2)	Pr(1)–O(4)#4	2.459(2)	Pr(1)–O(7)	2.489(3)
Pr(1)–O(3)#1	2.543(2)	Pr(1)–O(5)	2.506(2)	Pr(1)–O(8)	2.465(3)
3					
Nd(1)–O(1)	2.5252(19)	Nd(1)–O(4)#1	2.615(2)	Nd(1)–O(6)#2	2.493(2)
Nd(1)–O(2)	2.503(2)	Nd(1)–O(4)#3	2.443(2)	Nd(1)–O(7)	2.439(2)
Nd(1)–O(3)#1	2.5249(19)	Nd(1)–O(5)	2.464(2)	Nd(1)–O(8)	2.465(2)
4					
Sm(1)–O(1)	2.492(3)	Sm(1)–O(3)#1	2.496(3)	Sm(1)–O(6)#2	2.470(3)
Sm(1)–O(2)	2.612(3)	Sm(1)–O(4)#1	2.479(3)	Sm(1)–O(7)	2.413(3)
Sm(1)–O(2)#3	2.417(3)	Sm(1)–O(5)	2.441(3)	Sm(1)–O(8)	2.439(4)
5					
Eu(1)–O(1)	2.487(4)	Eu(1)–O(3)#1	2.480(4)	Eu(1)–O(6)#2	2.457(4)
Eu(1)–O(2)	2.599(4)	Eu(1)–O(4)#1	2.463(4)	Eu(1)–O(7)	2.401(4)
Eu(1)–O(2)#3	2.409(4)	Eu(1)–O(5)	2.432(4)	Eu(1)–O(8)	2.432(4)
6					
Gd(1)–O(1)	2.471(3)	Gd(1)–O(4)	2.423(3)	Gd(1)–O(7)	2.592(3)
Gd(1)–O(2)#1	2.456(3)	Gd(1)–O(5)#2	2.451(3)	Gd(1)–O(7)#3	2.391(3)
Gd(1)–O(3)#1	2.471(3)	Gd(1)–O(6)	2.385(3)	Gd(1)–O(8)	2.408(3)
7					
Tb(1)–O(2)	2.366(3)	Tb(1)–O(8)	2.397(4)	K(1)–O(6)	2.932(4)
Tb(1)–O(3)	2.388(4)	Tb(1)–O(9)	2.372(4)	K(1)–O(7)#5	2.718(4)

Tb(1)–O(4)#9	2.366(3)	K(1)–O(1)#2	3.079(4)	K(1)–O(8)	2.865(4)
Tb(1)–O(5)	2.406(3)	K(1)–O(2)	3.092(4)	K(1)–O(9)#5	2.985(4)
Tb(1)–O(6)	2.429(3)	K(1)–O(2)#2	3.057(4)		
Tb(1)–O(7)	2.359(3)	K(1)–O(3)#5	3.112(4)		
8					
Dy(1)–O(2)	2.356(3)	Dy(1)–O(8)	2.383(3)	K(1)–O(6)	2.930(3)
Dy(1)–O(3)	2.382(3)	Dy(1)–O(9)	2.359(3)	K(1)–O(7)#5	2.713(3)
Dy(1)–O(4)#8	2.350(3)	K(1)–O(1)#2	3.079(4)	K(1)–O(8)	2.864(4)
Dy(1)–O(5)	2.396(3)	K(1)–O(2)	3.082(4)	K(1)–O(9)#5	2.972(4)
Dy(1)–O(6)	2.424(3)	K(1)–O(2)#2	3.059(3)		
Dy(1)–O(7)	2.336(3)	K(1)–O(3)#5	3.092(4)		
9					
Ce(1)–O(1)	2.395(3)	Ce(2)–O(3)#6	2.362(3)	Ce(2)–O(14)	2.540(3)
Ce(1)–O(2)#5	2.472(3)	Ce(2)–O(4)#7	2.451(3)	K(1)–O(2)#5	2.655(3)
Ce(1)–O(7)#1	2.505(3)	Ce(2)–O(5)	2.472(3)	K(1)–O(6)#8	2.698(3)
Ce(1)–O(10)	2.499(3)	Ce(2)–O(7)#1	2.771(3)	K(1)–O(14)#2	2.906(3)
Ce(1)–O(11)#3	2.424(3)	Ce(2)–O(8)#1	2.583(3)	K(1)–O(1W)	2.806(3)
Ce(1)–O(12)#4	2.441(3)	Ce(2)–O(9)	2.616(3)	K(1)–O(2W)	2.761(4)
Ce(1)–O(13)	2.656(3)	Ce(2)–O(10)	2.686(3)	K(1)–O(3W)	2.632(4)
Ce(1)–O(1W)	2.577(3)	Ce(2)–O(13)	2.626(3)		
10					
Pr(1)–O(2)	2.474(3)	Pr(2)–O(1)	2.520(3)	Pr(2)–O(14)#2	2.560(3)
Pr(1)–O(7)	2.489(3)	Pr(2)–O(2)	2.787(4)	K(1)–O(4)#3	2.436(4)
Pr(1)–O(9)#3	2.465(3)	Pr(2)–O(3)#5	2.484(4)	K(1)–O(9)#3	2.397(4)
Pr(1)–O(10)#7	2.400(3)	Pr(2)–O(5)	2.434(3)	K(1)–O(13)#2	2.861(4)
Pr(1)–O(11)#8	2.431(3)	Pr(2)–O(6)#6	2.326(3)	K(1)–O(15)	2.561(4)
Pr(1)–O(12)#10	2.395(3)	Pr(2)–O(7)	2.663(3)	K(1)–O(16)	2.414(4)
Pr(1)–O(14)#2	2.692(3)	Pr(2)–O(8)	2.579(3)	K(1)–O(17)	2.395(4)
Pr(1)–O(15)	2.580(3)	Pr(2)–O(13)	2.498(3)		

Symmetry codes:

1 #1 $-x+1/2, -y-1/2, -z+1$; #3 $-x+1, -y-1, -z+1$; #4 $x, y-1, z$;

2 #1 $-x+1/2, -y+3/2, -z+1$; #2 $-x, -y+1, -z+1$; #4 $x, y-1, z$;

3 #1 $-x+1/2, -y+3/2, -z+2$; #2 $-x, -y+2, -z+2$; #3 $x, y+1, z$;

4 #1 $-x+1/2, -y-1/2, -z+1$; #2 $-x, -y, -z+1$; #3 $-x+1/2, -y+1/2, -z+1$;

5 #1 $-x+1/2, -y+3/2, -z+1$; #2 $-x, -y+1, -z+1$; #3 $-x+1/2, -y+1/2, -z+1$;

6 #1 $-x+3/2, -y+1/2, -z$; #2 $-x+1, -y+1, -z$; #3 $-x+3/2, -y+3/2, -z$;

7 #2 $-x+1, -y+1, -z$; #5 $x, y+1, z$; #9 $x-1, y, z$;

8 #2 $-x+1, -y+1, -z+2$; #5 $x, y-1, z$; #8 $x+1, y, z$;

9 #1 $-x+2, -y+2, -z+2$; #2 $-x+1, -y+1, -z+2$; #3 $x+1, y, z$; #4 $-x, -y+1, -z+1$; #5 $-x+1, -y+1, -z+1$; #6 $x, y, z+1$; #7 $-x+1, -y+2, -z+1$; #8 $-x+2, -y+1, -z+2$;

10 #2 $-x, -y+2, -z+1$; #3 $x, y+1, z$; #5 $-x+1, -y+1, -z+1$; #6 $-x, -y+1, -z+1$; #7 $-x+1, -y+1, -z$; #8 $-x, -y+2, -z$; #10 $x+1, y, z$.

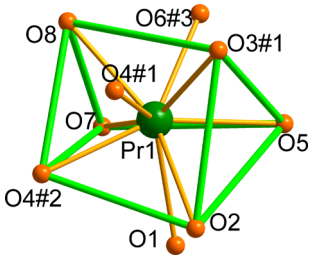

Fig. S1 The distorted tricapped trigonal prism coordination polyhedron of Pr(III) ion in **2**. Symmetry code: #1, 0.5 – *x*, 1.5 – *y*, 1 – *z*; #2, *x*, –1 + *y*, *z*; #3, – *x*, 1 – *y*, 1 – *z*.

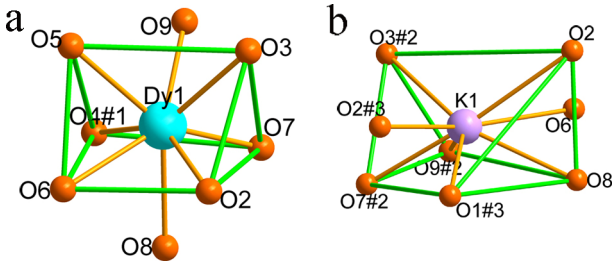

Fig. S2 The distorted bicapped trigonal prism coordination polyhedra of Dy(III) ion (a) and K^+ (b) in **8**. Symmetry code: #1, 1 + *x*, *y*, *z*; #2, *x*, –1 + *y*, *z*.

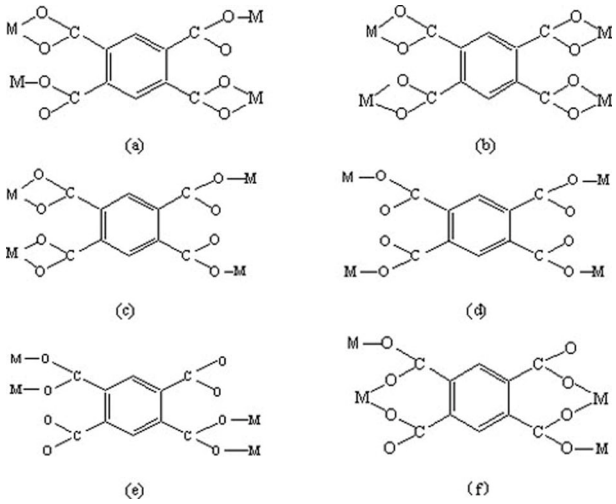

Fig. S3 μ_4 coordination modes of pma ligand in transition metal and lanthanide complexes (a-e being in reported complexes and f in compounds **7** and **8**).

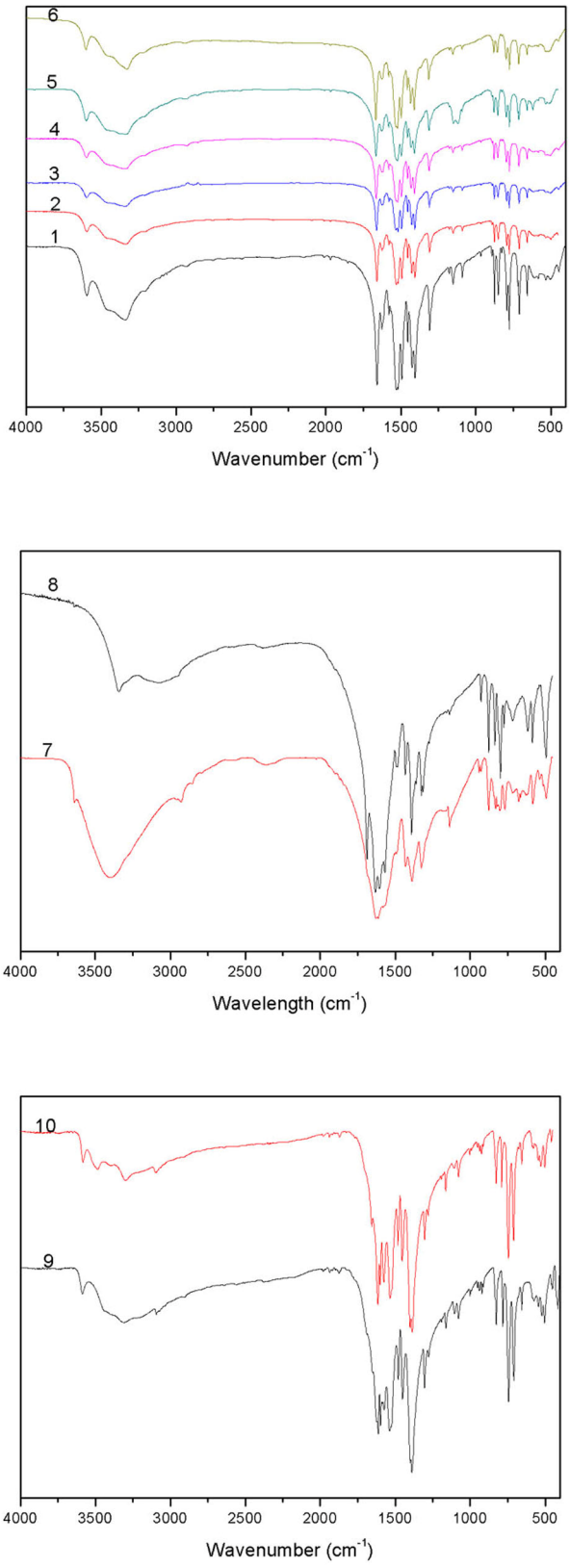

Fig. S4 The IR spectra of complexes **1-10**.