

SUPPORTING INFORMATIONS

Synthesis and Crystal Structure of Lanthanide Coordination Polymers with Nano-channels and Water Clusters

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- S1. Selected bond lengths (Å) and angles (°) for [Lu₂(pztc)_{1.5}(H₂O)₆]⁺·7.5H₂O (**2**)
S2. Selected bond lengths (Å) and angles (°) for [Er₂(pztc)_{1.5}(H₂O)₆]⁺·7H₂O (**3**)
S3. IR spectrum of complex [Yb₂(pztc)_{1.5}(H₂O)₆]⁺·7H₂O (**1**)
S4. IR spectrum of complex [[Lu₂(pztc)_{1.5}(H₂O)₆]⁺·7.5H₂O (**2**)
S5. IR spectrum of complex [Er₂(pztc)_{1.5}(H₂O)₆]⁺·7H₂O (**3**)
S6 TG curve of the complex **1**

S1 Selected Bond Lengths (Å) and Angles (°) for [Lu₂(pztc)_{1.5}(H₂O)₆]⁺·7.5H₂O

Lu(1)-O(1)	2.287(10)	Lu(1)-O(4)#1	2.312(10)
Lu(1)-O(12)#2	2.324(11)	Lu(1)-O(5)#1	2.353(10)
Lu(1)-O(9)	2.360(10)	Lu(1)-O(8)	2.370(10)
Lu(1)-N(2)#1	2.479(11)	Lu(1)-N(3)	2.503(12)
Lu(1)-N(1)	2.507(11)	Lu(2)-O(16)	2.295(10)
Lu(2)-O(17)	2.299(11)	Lu(2)-O(14)	2.323(10)
Lu(2)-O(13)	2.325(9)	Lu(2)-O(15)	2.338(12)
Lu(2)-O(7)	2.344(11)	Lu(2)-O(11)#3	2.348(10)
Lu(2)-O(18)	2.355(12)		
O(1)-Lu(1)-O(4)#1	82.6(4)	O(1)-Lu(1)-O(12)#2	77.8(3)
O(4)#1-Lu(1)-O(12)#2	78.4(4)	O(1)-Lu(1)-O(5)#1	82.5(4)
O(4)#1-Lu(1)-O(5)#1	129.9(3)	O(12)#2-Lu(1)-O(5)#1	142.8(4)
O(1)-Lu(1)-O(9)	145.3(3)	O(4)#1-Lu(1)-O(9)	84.0(4)
O(12)#2-Lu(1)-O(9)	130.1(4)	O(5)#1-Lu(1)-O(9)	82.0(4)
O(1)-Lu(1)-O(8)	129.9(3)	O(4)#1-Lu(1)-O(8)	140.8(4)
O(12)#2-Lu(1)-O(8)	87.3(4)	O(5)#1-Lu(1)-O(8)	81.6(4)
O(9)-Lu(1)-O(8)	77.8(4)	O(1)-Lu(1)-N(2)#1	74.2(4)

O(4)#1-Lu(1)-N(2)#1	64.7(4)	O(12)#2-Lu(1)-N(2)#1	135.8(4)
O(5)#1-Lu(1)-N(2)#1	65.2(4)	O(9)-Lu(1)-N(2)#1	71.1(4)
O(8)-Lu(1)-N(2)#1	136.8(4)	O(1)-Lu(1)-N(3)	137.5(4)
O(4)#1-Lu(1)-N(3)	71.7(4)	O(12)#2-Lu(1)-N(3)	64.4(4)
O(5)#1-Lu(1)-N(3)	139.9(4)	O(9)-Lu(1)-N(3)	65.7(4)
O(8)-Lu(1)-N(3)	69.2(4)	N(2)#1-Lu(1)-N(3)	120.5(4)
O(1)-Lu(1)-N(1)	65.5(4)	O(4)#1-Lu(1)-N(1)	138.9(4)
O(12)#2-Lu(1)-N(1)	70.3(4)	O(5)#1-Lu(1)-N(1)	72.9(4)
O(9)-Lu(1)-N(1)	136.8(4)	O(8)-Lu(1)-N(1)	64.4(4)
N(2)#1-Lu(1)-N(1)	124.5(4)	N(3)-Lu(1)-N(1)	115.0(3)
O(16)-Lu(2)-O(17)	78.6(4)	O(16)-Lu(2)-O(14)	115.6(4)
O(17)-Lu(2)-O(14)	142.7(4)	O(16)-Lu(2)-O(13)	141.7(4)
O(17)-Lu(2)-O(13)	112.6(4)	O(14)-Lu(2)-O(13)	78.4(4)
O(16)-Lu(2)-O(15)	78.0(4)	O(17)-Lu(2)-O(15)	77.2(4)
O(14)-Lu(2)-O(15)	72.9(4)	O(13)-Lu(2)-O(15)	139.2(4)
O(16)-Lu(2)-O(7)	143.1(4)	O(17)-Lu(2)-O(7)	70.7(4)
O(14)-Lu(2)-O(7)	80.5(4)	O(13)-Lu(2)-O(7)	71.4(4)
O(15)-Lu(2)-O(7)	75.7(4)	O(16)-Lu(2)-O(11)#3	70.8(4)
O(17)-Lu(2)-O(11)#3	140.9(4)	O(14)-Lu(2)-O(11)#3	74.5(4)
O(13)-Lu(2)-O(11)#3	80.2(4)	O(15)-Lu(2)-O(11)#3	117.9(4)
O(7)-Lu(2)-O(11)#3	145.3(3)	O(16)-Lu(2)-O(18)	77.8(4)
O(17)-Lu(2)-O(18)	73.0(5)	O(14)-Lu(2)-O(18)	141.6(5)
O(13)-Lu(2)-O(18)	71.6(4)	O(15)-Lu(2)-O(18)	144.6(4)
O(7)-Lu(2)-O(18)	110.9(4)	O(11)#3-Lu(2)-O(18)	77.2(4)

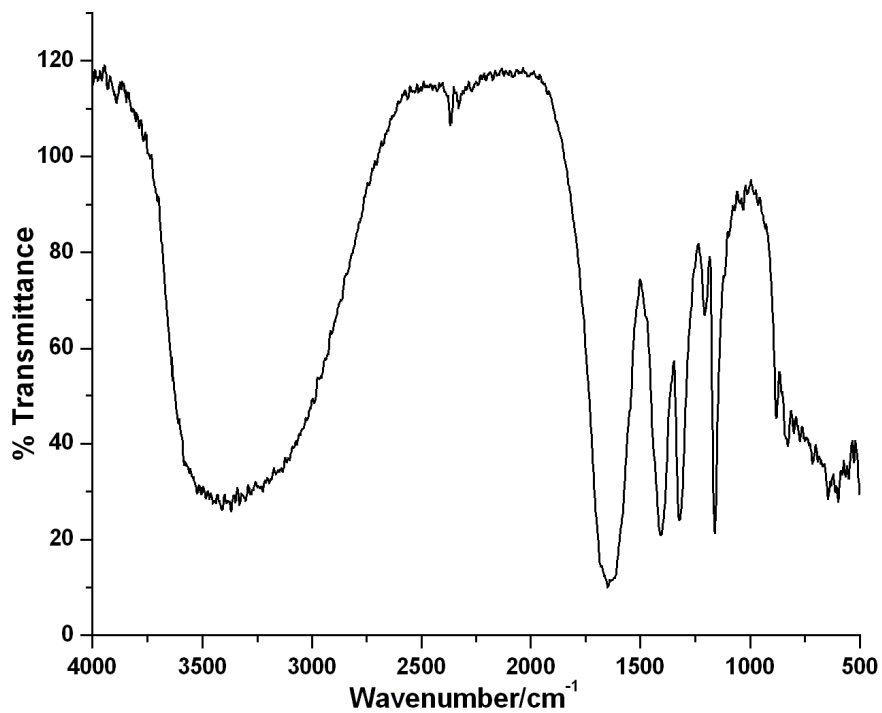
Symmetry code: #1 x, -y+3/2, z+1/2; #2 -x+2, -y+1, -z+2; #3 -x+1, -y+1, -z+2.

S2. Selected bond lengths (Å) and angles (°) for [Er₂(pztc)_{1.5}(H₂O)₆]-7H₂O (3)

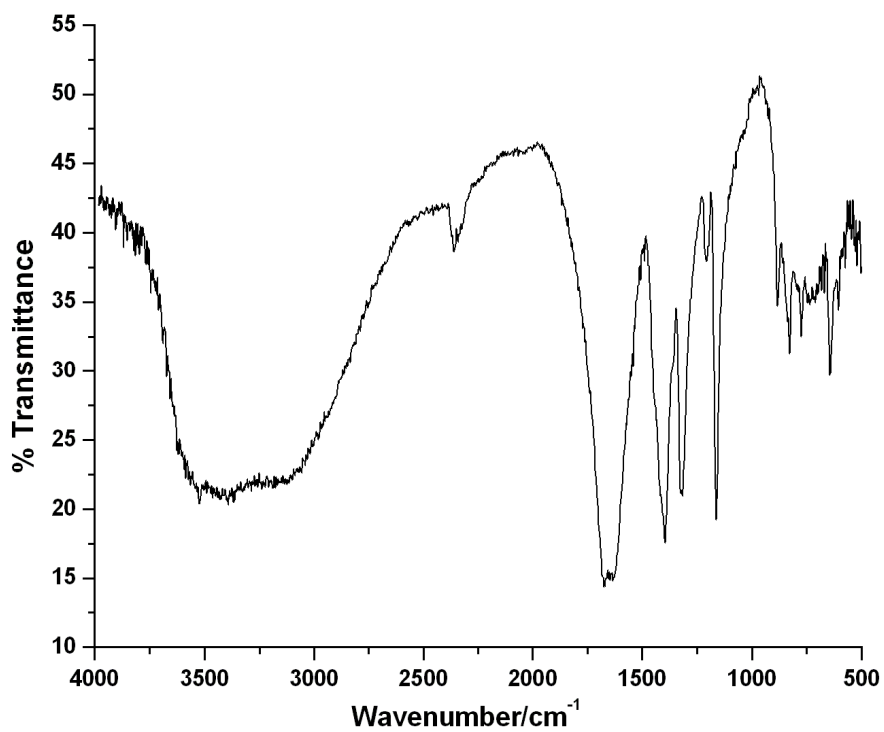
Er(1)-O(12)	2.290(5)	Er(1)-O(4)#1	2.328(4)
Er(1)-O(5)#1	2.329(4)	Er(1)-O(9)	2.344(4)
Er(1)-O(1)	2.374(4)	Er(1)-O(8)	2.374(4)
Er(1)-N(2)#1	2.479(5)	Er(1)-N(1)	2.500(5)
Er(1)-N(3)	2.534(5)	Er(2)-O(14)	2.295(5)
Er(2)-O(17)	2.297(5)	Er(2)-O(15)	2.305(5)
Er(2)-O(2)	2.320(4)	Er(2)-O(18)	2.327(5)
Er(2)-O(13)	2.366(6)	Er(2)-O(11)#2	2.397(4)
Er(2)-O(16)	2.425(5)		
O(12)-Er(1)-O(4)#1	141.33(16)	O(12)-Er(1)-O(5)#1	80.83(17)
O(4)#1-Er(1)-O(5)#1	130.55(16)	O(12)-Er(1)-O(9)	128.73(16)
O(4)#1-Er(1)-O(9)	81.94(16)	O(5)#1-Er(1)-O(9)	85.00(17)
O(12)-Er(1)-O(1)	83.20(17)	O(4)#1-Er(1)-O(1)	81.07(16)
O(5)#1-Er(1)-O(1)	141.71(16)	O(9)-Er(1)-O(1)	78.34(16)
O(12)-Er(1)-O(8)	78.90(16)	O(4)#1-Er(1)-O(8)	84.47(16)

O(5)#1-Er(1)-O(8)	80.64(16)	O(9)-Er(1)-O(8)	146.19(15)
O(1)-Er(1)-O(8)	129.69(15)	O(12)-Er(1)-N(2)#1	138.38(17)
O(4)#1-Er(1)-N(2)#1	65.56(16)	O(5)#1-Er(1)-N(2)#1	65.00(16)
O(9)-Er(1)-N(2)#1	73.24(17)	O(1)-Er(1)-N(2)#1	138.42(17)
O(8)-Er(1)-N(2)#1	72.95(16)	O(12)-Er(1)-N(1)	68.91(17)
O(4)#1-Er(1)-N(1)	72.42(17)	O(5)#1-Er(1)-N(1)	137.26(17)
O(9)-Er(1)-N(1)	137.53(17)	O(1)-Er(1)-N(1)	64.88(16)
O(8)-Er(1)-N(1)	64.81(16)	N(2)#1-Er(1)-N(1)	122.06(17)
O(12)-Er(1)-N(3)	64.09(16)	O(4)#1-Er(1)-N(3)	138.77(16)
O(5)#1-Er(1)-N(3)	72.18(16)	O(9)-Er(1)-N(3)	64.65(16)
O(1)-Er(1)-N(3)	69.53(15)	O(8)-Er(1)-N(3)	136.62(16)
N(2)#1-Er(1)-N(3)	121.31(17)	N(1)-Er(1)-N(3)	116.62(16)
O(14)-Er(2)-O(17)	101.3(2)	O(14)-Er(2)-O(15)	144.76(18)
O(17)-Er(2)-O(15)	91.44(18)	O(14)-Er(2)-O(2)	77.77(18)
O(17)-Er(2)-O(2)	140.11(16)	O(15)-Er(2)-O(2)	71.66(16)
O(14)-Er(2)-O(18)	142.33(19)	O(17)-Er(2)-O(18)	82.9(2)
O(15)-Er(2)-O(18)	71.37(18)	O(2)-Er(2)-O(18)	122.27(18)
O(14)-Er(2)-O(13)	78.0(2)	O(17)-Er(2)-O(13)	145.40(19)
O(15)-Er(2)-O(13)	109.2(2)	O(2)-Er(2)-O(13)	74.13(18)
O(18)-Er(2)-O(13)	78.1(2)	O(14)-Er(2)-O(11)#2	78.01(17)
O(17)-Er(2)-O(11)#2	74.87(17)	O(15)-Er(2)-O(11)#2	137.23(16)
O(2)-Er(2)-O(11)#2	140.93(15)	O(18)-Er(2)-O(11)#2	66.88(16)
O(13)-Er(2)-O(11)#2	71.14(18)	O(14)-Er(2)-O(16)	75.7(2)
O(17)-Er(2)-O(16)	69.59(17)	O(15)-Er(2)-O(16)	78.37(19)
O(2)-Er(2)-O(16)	71.67(17)	O(18)-Er(2)-O(16)	138.24(19)
O(13)-Er(2)-O(16)	140.31(19)	O(11)#2-Er(2)-O(16)	129.89(1)

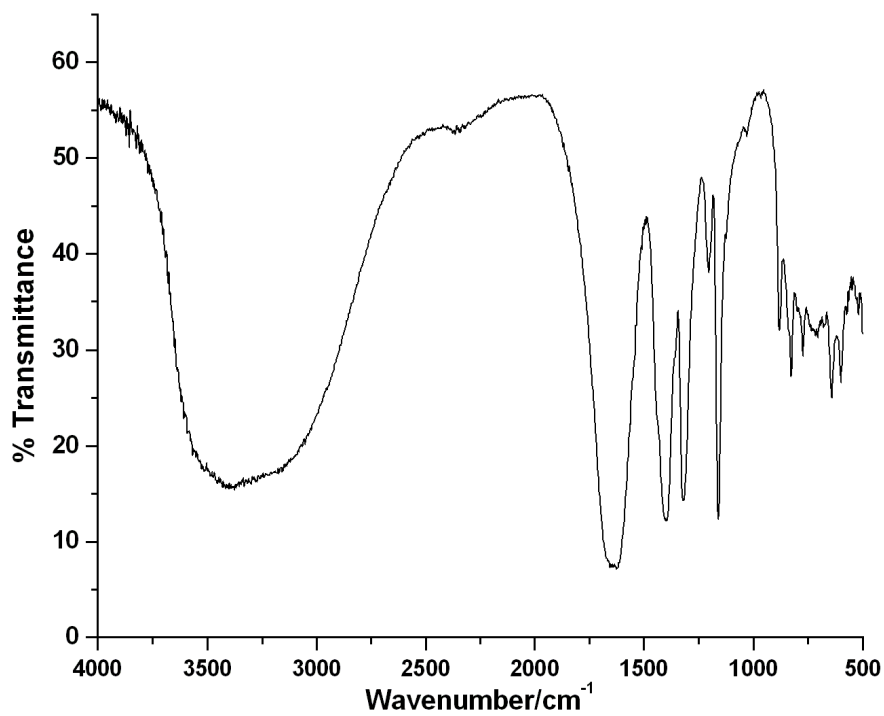
Symmetry code: #1 x,-y+1/2,z-1/2; #2 x+1,y,z



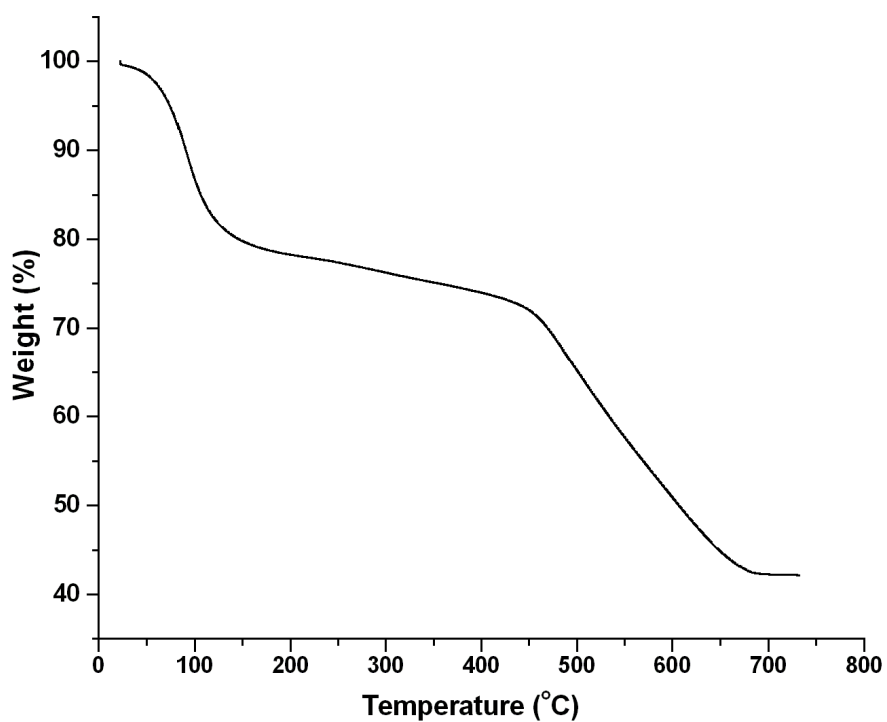
S3. IR spectrum of complex $[\text{Yb}_2(\text{pztc})_{1.5}(\text{H}_2\text{O})_6] \cdot 7\text{H}_2\text{O}$ (**1**)



S4. IR spectrum of complex $[[\text{Lu}_2(\text{pztc})_{1.5}(\text{H}_2\text{O})_6] \cdot 7.5\text{H}_2\text{O}$ (**2**)



S5. IR spectrum of complex $[\text{Er}_2(\text{pztc})_{1.5}(\text{H}_2\text{O})_6] \cdot 7\text{H}_2\text{O}$ (**3**)



S6 TG curve of the complex **1**