Electronic Supplementary Information

Unusual method for phenolic hydroxyl bridged lanthanide CPs: syntheses, characterization, one and two photon luminescence

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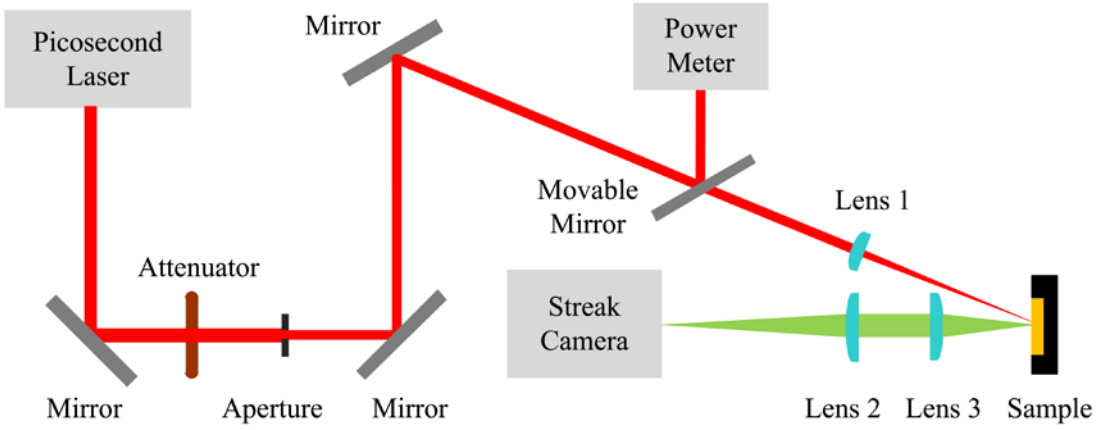


Scheme S1. The schematic diagram of the experiment setup for upconversion.

Table S1. Bond lengths and bond angles for **1**-**4** and **8**.

$[Tb(HL)L\cdot H_2O]_n$ (**1**)

Tb(1)-O(6)#1	2.307(4)	Tb(1)-O(1)	2.406(4)
Tb(1)-O(6)	2.315(4)	Tb(1)-O(2)	2.475(4)
Tb(1)-O(7)	2.319(4)	Tb(1)-O(4)#2	2.774(4)
Tb(1)-O(5)#2	2.363(4)	Tb(1)···Tb(6)#1	3.8353(6)
Tb(1)-O(4)	2.391(4)		
O(6)#1-Tb(1)-O(6)	67.86(16)	O(6)#1-Tb(1)-O(2)	158.56(13)
O(6)#1-Tb(1)-O(7)	85.17(14)	O(6)-Tb(1)-O(2)	129.90(12)
O(6)-Tb(1)-O(7)	85.71(15)	O(7)-Tb(1)-O(2)	84.63(14)
O(6)#1-Tb(1)-O(5)#2	86.12(14)	O(5)#2-Tb(1)-O(3)	84.67(14)
O(6)-Tb(1)-O(5)#2	137.80(13)	O(4)-Tb(1)-O(3)	99.40(13)
O(7)-Tb(1)-O(5)#2	126.01(14)	O(1)-Tb(1)-O(3)	53.25(13)
O(6)#1-Tb(1)-O(4)	97.39(13)	O(6)#1-Tb(1)-O(4)#2	89.75(12)
O(6)-Tb(1)-O(4)	74.14(13)	O(6)-Tb(1)-O(4)#2	152.89(12)
O(7)-Tb(1)-O(4)	156.81(13)	O(7)-Tb(1)-O(4)#2	76.68(13)
O(3)#2-Tb(1)-O(4)	77.17(13)	O(5)#2-Tb(1)-O(4)#2	49.97(12)
O(6)#1-Tb(1)-O(1)	143.05(13)	O(4)-Tb(1)-O(4)#2	126.09(5)
O(6)-Tb(1)-O(1)	76.79(13)	O(1)-Tb(1)-O(4)#2	120.20(13)
O(7)-Tb(1)-O(1)	81.77(15)	O(3)-Tb(1)-O(4)#2	69.54(12)
O(5)#2-Tb(1)-O(1)	129.07(15)	Tb(1)#1-O(6)-Tb(1)	112.09(15)
O(4)-Tb(1)-O(1)	82.53(14)	Tb(1)-O(4)-Tb(1)#3	145.13(15)

Symmetry transformations used to generate equivalent atoms: #1 -x+2, -y, -z+1; #2 -x+2, y+1/2, -z+3/2; #3, -x+2, y-1/2, -z+3/2.

$[Nd(HL)L\cdot H_2O]_n$ (**2**)

Nd(1)-O(3)	2.362(7)	Nd(1)-O(2)#2	2.734(7)
Nd(1)-O(3)#1	2.368(7)	Nd(1)···Nd(1)#1	3.9403(11)
Nd(1)-O(1)#2	2.437(7)	O(1)-Nd(1)#3	2.437(7)
Nd(1)-O(2)	2.475(7)	O(3)-Nd(1)#1	2.368(7)
Nd(1)-O(5)	2.483(7)	Nd(1)-O(4)	2.518(7)
O(3)-Nd(1)-O(3)#1	67.2(3)	O(1)#2-Nd(1)-O(4)	87.3(3)
O(3)-Nd(1)-O(1)#2	136.1(3)	O(2)-Nd(1)-O(4)	100.5(2)
O(3)#1-Nd(1)-O(1)#2	86.6(3)	O(5)-Nd(1)-O(4)	51.6(2)
O(3)-Nd(1)-O(2)	72.5(2)	O(3)-Nd(1)-O(2)#2	153.1(2)
O(3)#1-Nd(1)-O(2)	97.7(2)	O(3)#1-Nd(1)-O(2)#2	89.6(2)
O(1)#2-Nd(1)-O(2)	77.2(2)	O(1)#2-Nd(1)-O(2)# 2	50.0(2)
O(3)-Nd(1)-O(5)	77.2(3)	O(2)-Nd(1)-O(2)#2	126.20(10)
O(3)#1-Nd(1)-O(5)	142.2(2)	O(5)-Nd(1)-O(2)#2	120.6(2)
O(1)#2-Nd(1)-O(5)	129.6(3)	O(4)-Nd(1)-O(2)#2	71.2(2)
O(2)-Nd(1)-O(5)	82.8(2)	O(3)-Nd(1)-O(4)	128.7(2)
O(3)#1-Nd(1)-O(4)	159.0(3)		

Symmetry transformations used to generate equivalent atoms: #1 -x+1, -y+2, -z+1;
#2 -x+1, y+1/2, -z+3/2; #3 -x+1, y-1/2, -z+3/2.

$[Eu(HL)L\cdot H_2O]_n$ (**3**)

Eu(1)-O(3)#1	2.321(3)	Eu(1)-O(4)	2.492(3)
Eu(1)-O(3)#2	2.335(3)	Eu(1)-O(2)	2.754(3)
Eu(1)-O(7)	2.349(4)	O(2)-Eu(1)#4	2.425(3)
Eu(1)-O(1)	2.391(4)	Eu(1)···Eu(1)#3	3.8763(4)
Eu(1)-O(5)	2.415(3)		
O(3)#1-Eu(1)-O(3)#2	67.29(13)	O(7)-Eu(1)-O(2)#2	155.46(12)
O(3)#1-Eu(1)-O(7)	84.59(12)	O(1)-Eu(1)-O(2)# 2	77.33(11)
O(3)#2-Eu(1)-O(7)	85.22(11)	O(5)-Eu(1)-O(2)# 2	82.35(11)
O(3)#1-Eu(1)-O(1)	86.52(12)	O(1)-Eu(1)-O(4)	85.69(12)
O(3)#2-Eu(1)-O(1)	136.98(11)	O(5)-Eu(1)-O(4)	52.89(11)
O(7)-Eu(1)-O(1)	127.20(12)	O(3)#1-Eu(1)-O(2)	89.99(10)
O(3)#1-Eu(1)-O(5)	142.48(11)	O(3)#2-Eu(1)-O(2)	153.04(10)
O(3)#2-Eu(1)-O(5)	76.95(11)	O(7)-Eu(1)-O(2)	78.07(11)
O(7)-Eu(1)-O(5)	81.42(13)	O(1)-Eu(1)-O(2)	49.96(10)
O(1)-Eu(1)-O(5)	129.19(12)	O(5)-Eu(1)-O(2)	120.47(10)
O(3)#1-Eu(1)-O(2)#2	97.39(10)	O(2)#2-Eu(1)-O(2)	126.25(4)
O(3)#2-Eu(1)-O(2)#2	73.24(11)	O(4)-Eu(1)-O(2)	69.81(10)

Symmetry transformations used to generate equivalent atoms: #1 x, -y+3/2, z-1/2; #2 -x+1, y-1/2, -z+1/2; #3 -x+1, -y+1, -z; #4 -x+1, y+1/2, -z+1/2.

$[Gd(HL)L\cdot H_2O]_n$ (**4**)

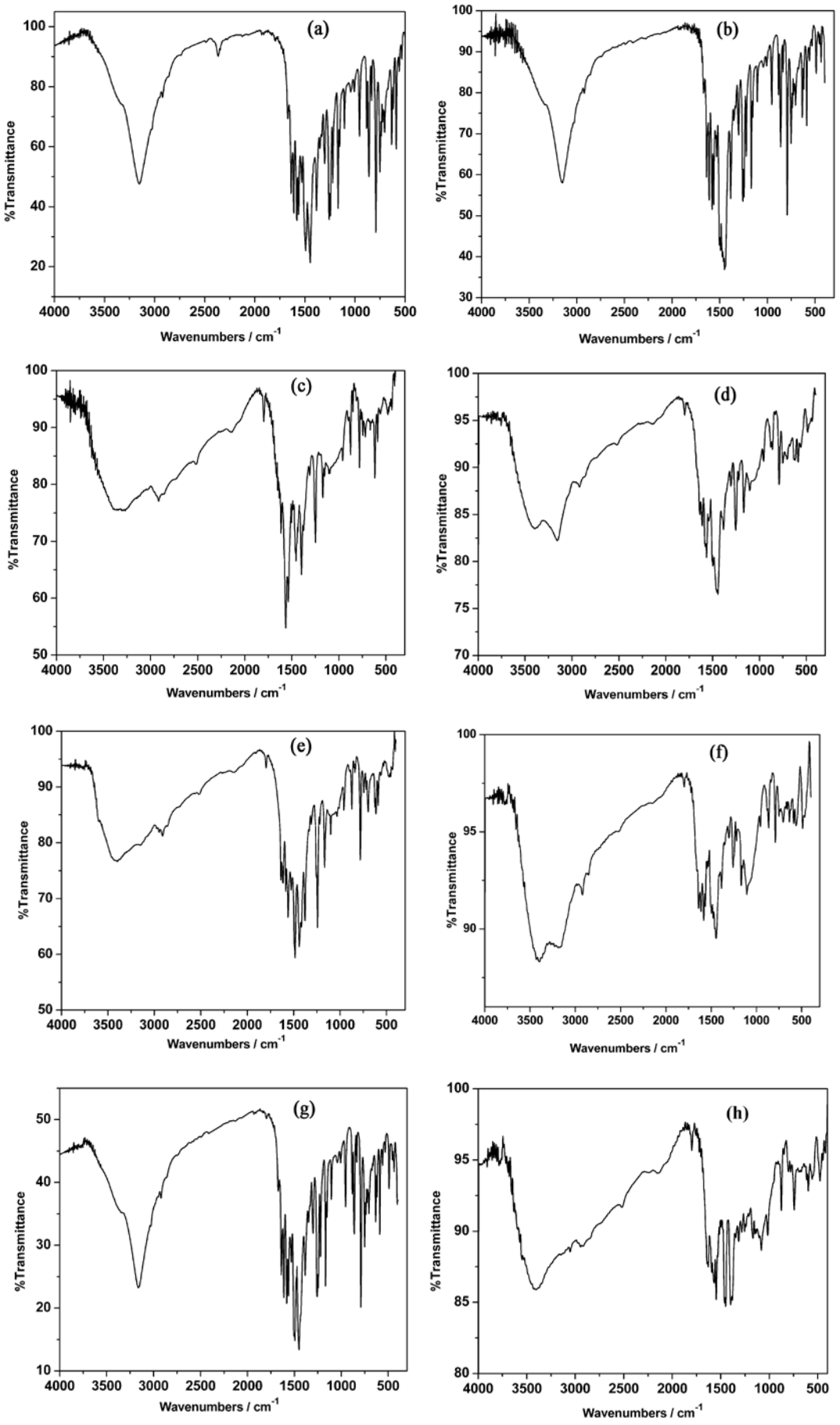
Gd(1)-O(3)	2.312(7)	Gd(1)-O(5)	2.403(7)
Gd(1)-O(7)	2.332(6)	Gd(1)-O(4)	2.490(6)
Gd(1)-O(1)	2.374(6)	Gd(1)···Gd(1)	3.8583(8)
Gd(1)-O(2)	2.381(6)		
O(3) -Gd(1)-O(7)	84.9(2)	O(1)-Gd(1)-O(4)	84.8(2)
O(7)-Gd(1)-O(1)	126.6(2)	O(2)-Gd(1)-O(4)	100.6(2)
O(3)-Gd(1)-O(2)	97.3(2)	O(5)-Gd(1)-O(4)	53.5(2)
O(7)-Gd(1)-O(2)	155.6(2)	O(7)-Gd(1)-O2	77.5(2)
O(3)-Gd(1)-O(5)	142.8(2)	O(1)-Gd(1)-O(2)	126.65(9)
O(7)-Gd(1)-O(5)	81.5(2)	O(4)-Gd(1)-O(2)	69.0(2)
O(1)-Gd(1)-O(5)	128.9(3)	O(3)-Gd(1)-O(4)	157.9(2)
O(2)-Gd(1)-O(5)	82.3(2)	O(7)-Gd(1)-O(4)	84.1(2)

$[Eu(HNA)(NA)\cdot H_2O]_n$ (**8**)

Eu(1)-O(2)	2.320(7)	Eu(1)-O(1)#2	2.491(8)
Eu(1)-O(1)	2.392(7)	Eu(1)-O(8)	2.542(7)
Eu(1)-O(5)	2.430(8)	Eu(1)-O(3)#1	2.631(8)
Eu(1)-O(4)#1	2.445(7)	Eu(1)-O(2)#1	2.482(7)
Eu(1)-O(7)	2.462(8)	Eu(1)···Eu(1)#1	4.0159(5)
O(2)-Eu(1)-O(1)	69.4(2)	O(4)#1-Eu(1)-O(1)#2	72.6(2)
O(2)-Eu(1)-O(5)	71.4(2)	O(7)-Eu(1)-O(1)#2	76.4(3)

O(1)-Eu(1)-O(5)	93.2(3)	O(2)#1-Eu(1)-O(1)#2	138.6(3)
O(1)-Eu(1)-O(4)#1	182.9(2)	O(2)-Eu(1)-O(8)	119.2(3)
O(5)-Eu(1)-O(4)#1	145.6(2)	O(1)-Eu(1)-O(8)	69.7(2)
O(2)-Eu(1)-O(7)	129.0(3)	O(5)-Eu(1)-O(8)	67.4(2)
O(1)-Eu(1)-O(7)	147.1(3)	O(4)#1-Eu(1)-O(8)	139.7(2)
O(5)-Eu(1)-O(7)	72.9(3)	O(7)-Eu(1)-O(8)	77.4(3)
O(4)#1-Eu(1)-O(7)	125.3(2)	O(2)#1-Eu(1)-O(8)	66.8(3)
O(2)-Eu(1)-O(2)#1	128.2(2)	O(1)#2-Eu(1)-O(8)	147.3(2)
O(1)-Eu(1)-O(2)#1	65.2(2)	O(2)-Eu(1)-O(3)#1	152.5(3)
O(5)-Eu(1)-O(2)#1	133.8(3)	O(1)-Eu(1)-O(3)#1	115.4(3)
O(4)#1-Eu(1)-O(2)#1	75.1(2)	O(5)-Eu(1)-O(3)#1	132.0(3)
O(7)-Eu(1)-O(2)#1	102.7(2)	O(4)#1-Eu(1)-O(3)#1	78.9(2)
O(2)-Eu(1)-O(1)#1	266.0(3)	O(7)-Eu(1)-O(3)#1	62.1(3)
O(1)-Eu(1)-O(1)#2	133.56(15)	O(1)#2-Eu(1)-O(3)#1	98.1(2)
O(5)-Eu(1)-O(1)#2	86.3(3)	O(8)-Eu(1)-O(3)#1	86.6(3)

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



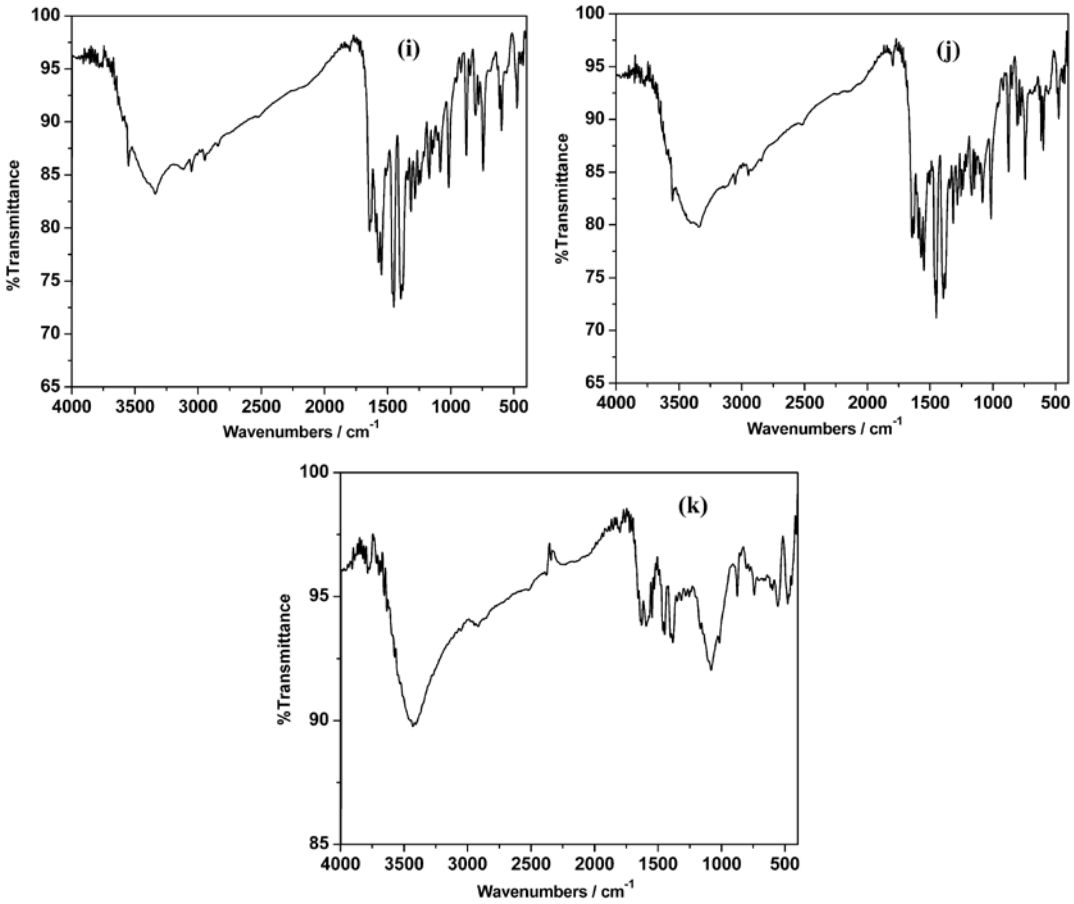


Fig. S1. FT-IR spectra of **1**-**11**, which corresponding to figures a-k.