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Supporting Information

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Table S1 Selected bond lengths [Å] and angles [°] for complexes **1- 6**

1			
Pr(1)-O(4)	2.376(3)	Pr(1)-O(10)	2.423(3)
Pr(1)-O(7)	2.384(3)	Pr(1)-O(1)	2.391(3)
Pr(1)-N(1)	2.642(3)	Pr(1)-N(2)	2.654(3)
Pr(1)-N(6)	2.649(3)	Pr(1)-N(5)	2.675(3)
O(4)-Pr(1)-O(7)	97.04(11)	O(4)-Pr(1)-O(10)	91.55(10)
O(4)-Pr(1)-O(1)	144.31(9)	O(7)-Pr(1)-O(10)	141.93(11)
O(7)-Pr(1)-O(1)	95.89(10)	O(1)-Pr(1)-O(10)	98.39(10)
O(4)-Pr(1)-N(1)	75.93(10)	O(4)-Pr(1)-N(2)	77.52(10)
O(7)-Pr(1)-N(1)	78.19(10)	O(7)-Pr(1)-N(2)	140.08(10)

O(1)-Pr(1)-N(1)	74.41(9)	O(1)-Pr(1)-N(2)	71.29(10)
O(10)-Pr(1)-N(1)	139.72(11)	O(10)-Pr(1)-N(2)	77.98(11)
O(4)-Pr(1)-N(6)	138.63(10)	O(4)-Pr(1)-N(5)	76.88(9)
O(7)-Pr(1)-N(6)	75.80(12)	O(7)-Pr(1)-N(5)	72.53(10)
O(1)-Pr(1)-N(6)	76.90(10)	O(1)-Pr(1)-N(5)	138.81(9)
O(10)-Pr(1)-N(6)	73.42(12)	O(10)-Pr(1)-N(5)	73.52(10)
N(1)-Pr(1)-N(6)	138.64(10)	N(1)-Pr(1)-N(5)	136.77(10)
N(1)-Pr(1)-N(2)	62.04(10)	N(6)-Pr(1)-N(5)	62.00(10)
N(6)-Pr(1)-N(2)	133.01(11)	N(2)-Pr(1)-N(5)	140.76(10)
		2	
Sm(1)-O(4)	2.330(4)	Sm(1)-O(10)	2.379(5)
Sm(1)-O(7)	2.337(5)	Sm(1)-O(1)	2.354(4)
Sm(1)-N(1)	2.601(5)	Sm(1)-N(2)	2.608(5)
Sm(1)-N(6)	2.603(5)	Sm(1)-N(5)	2.633(5)
O(4)-Sm(1)-O(7)	97.53(17)	O(4)-Sm(1)-O(10)	91.41(17)
O(4)-Sm(1)-O(1)	143.99(14)	O(7)-Sm(1)-O(10)	141.61(16)
O(7)-Sm(1)-O(1)	95.47(16)	O(1)-Sm(1)-O(10)	98.85(16)
O(4)-Sm(1)-N(1)	75.58(16)	O(4)-Sm(1)-N(2)	77.03(16)
O(7)-Sm(1)-N(1)	77.79(16)	O(7)-Sm(1)-N(2)	140.83(16)
O(1)-Sm(1)-N(1)	74.62(15)	O(1)-Sm(1)-N(2)	71.76(16)
O(10)-Sm(1)-N(1)	140.42(17)	O(10)-Sm(1)-N(2)	77.56(17)
O(4)-Sm(1)-N(6)	139.50(16)	O(4)-Sm(1)-N(5)	76.24(16)
O(7)-Sm(1)-N(6)	75.82(18)	O(7)-Sm(1)-N(5)	72.67(16)
O(1)-Sm(1)-N(6)	76.33(16)	O(1)-Sm(1)-N(5)	139.77(16)
O(10)-Sm(1)-N(6)	73.33(19)	O(10)-Sm(1)-N(5)	73.43(17)
N(1)-Sm(1)-N(6)	138.24(18)	N(1)-Sm(1)-N(5)	135.56(17)
N(1)-Sm(1)-N(2)	63.21(17)	N(6)-Sm(1)-N(5)	63.56(18)
N(6)-Sm(1)-N(2)	132.29(18)	N(2)-Sm(1)-N(5)	139.61(17)
		3	
Eu(1)-O(4)	2.317(5)	Eu(1)-O(10)	2.356(5)
Eu(1)-O(7)	2.324(5)	Eu(1)-O(1)	2.347(5)
Eu(1)-N(1)	2.587(6)	Eu(1)-N(2)	2.594(6)
Eu(1)-N(6)	2.590(6)	Eu(1)-N(5)	2.622(6)
O(4)-Eu(1)-O(7)	97.46(19)	O(4)-Eu(1)-O(10)	91.5(2)
O(4)-Eu(1)-O(1)	143.89(17)	O(7)-Eu(1)-O(10)	141.37(19)
O(7)-Eu(1)-O(1)	95.43(18)	O(1)-Eu(1)-O(10)	99.13(17)
O(4)-Eu(1)-N(1)	75.78(18)	O(4)-Eu(1)-N(2)	76.82(19)
O(7)-Eu(1)-N(1)	77.52(19)	O(7)-Eu(1)-N(2)	141.03(19)
O(1)-Eu(1)-N(1)	74.34(17)	O(1)-Eu(1)-N(2)	72.02(18)
O(10)-Eu(1)-N(1)	140.9(2)	O(10)-Eu(1)-N(2)	77.6(2)
O(4)-Eu(1)-N(6)	139.41(18)	O(4)-Eu(1)-N(5)	76.58(18)
O(7)-Eu(1)-N(6)	76.0(2)	O(7)-Eu(1)-N(5)	72.47(18)

O(1)-Eu(1)-N(6)	76.53(18)	O(1)-Eu(1)-N(5)	139.53(18)
O(10)-Eu(1)-N(6)	73.0(2)	O(10)-Eu(1)-N(5)	73.27(19)
N(1)-Eu(1)-N(6)	138.1(2)	N(1)-Eu(1)-N(5)	135.64(19)
N(1)-Eu(1)-N(2)	63.64(19)	N(6)-Eu(1)-N(5)	63.2(2)
N(6)-Eu(1)-N(2)	132.3(2)	N(2)-Eu(1)-N(5)	139.6(2)
		4	
Gd(1)-O(4)	2.308(4)	Gd(1)-O(10)	2.355(4)
Gd(1)-O(7)	2.315(4)	Gd(1)-O(1)	2.324(3)
Gd(1)-N(1)	2.577(4)	Gd(1)-N(2)	2.583(5)
Gd(1)-N(6)	2.579(5)	Gd(1)-N(5)	2.621(4)
O(4)-Gd(1)-O(7)	97.84(14)	O(4)-Gd(1)-O(10)	91.39(14)
O(4)-Gd(1)-O(1)	143.78(13)	O(7)-Gd(1)-O(10)	141.81(14)
O(7)-Gd(1)-O(1)	94.99(13)	O(1)-Gd(1)-O(10)	99.09(13)
O(4)-Gd(1)-N(1)	75.40(13)	O(4)-Gd(1)-N(2)	77.16(14)
O(7)-Gd(1)-N(1)	77.50(14)	O(7)-Gd(1)-N(2)	141.20(14)
O(1)-Gd(1)-N(1)	74.58(13)	O(1)-Gd(1)-N(2)	71.72(14)
O(10)-Gd(1)-N(1)	140.52(15)	O(10)-Gd(1)-N(2)	76.98(15)
O(4)-Gd(1)-N(6)	139.62(14)	O(4)-Gd(1)-N(5)	76.12(13)
O(7)-Gd(1)-N(6)	75.45(15)	O(7)-Gd(1)-N(5)	72.68(13)
O(1)-Gd(1)-N(6)	76.46(14)	O(1)-Gd(1)-N(5)	140.10(13)
O(10)-Gd(1)-N(6)	73.70(16)	O(10)-Gd(1)-N(5)	73.80(13)
N(1)-Gd(1)-N(6)	138.01(15)	N(1)-Gd(1)-N(5)	134.96(14)
N(1)-Gd(1)-N(2)	63.93(15)	N(6)-Gd(1)-N(5)	63.79(14)
N(6)-Gd(1)-N(2)	132.06(16)	N(2)-Gd(1)-N(5)	139.47(14)
		5	
Dy(1)-O(4)	2.283(3)	Dy(1)-O(10)	2.320(3)
Dy(1)-O(7)	2.291(3)	Dy(1)-O(1)	2.302(3)
Dy(1)-N(1)	2.549(4)	Dy(1)-N(2)	2.558(4)
Dy(1)-N(6)	2.555(4)	Dy(1)-N(5)	2.593(3)
O(4)-Dy(1)-O(7)	98.33(12)	O(4)-Dy(1)-O(10)	91.30(12)
O(4)-Dy(1)-O(1)	143.63(11)	O(7)-Dy(1)-O(10)	141.37(12)
O(7)-Dy(1)-O(1)	94.62(11)	O(1)-Dy(1)-O(10)	99.43(12)
O(4)-Dy(1)-N(1)	75.41(11)	O(4)-Dy(1)-N(2)	76.78(12)
O(7)-Dy(1)-N(1)	77.42(12)	O(7)-Dy(1)-N(2)	141.60(12)
O(1)-Dy(1)-N(1)	74.51(11)	O(1)-Dy(1)-N(2)	72.07(12)
O(10)-Dy(1)-N(1)	141.05(12)	O(10)-Dy(1)-N(2)	77.02(12)
O(4)-Dy(1)-N(6)	140.12(11)	O(4)-Dy(1)-N(5)	76.18(11)
O(7)-Dy(1)-N(6)	75.45(13)	O(7)-Dy(1)-N(5)	72.84(11)
O(1)-Dy(1)-N(6)	76.09(11)	O(1)-Dy(1)-N(5)	140.19(11)
O(10)-Dy(1)-N(6)	73.38(14)	O(10)-Dy(1)-N(5)	73.38(12)
N(1)-Dy(1)-N(6)	137.76(13)	N(1)-Dy(1)-N(5)	134.85(12)
N(1)-Dy(1)-N(2)	64.41(12)	N(6)-Dy(1)-N(5)	64.26(12)

N(6)-Dy(1)-N(2)	131.64(13)	N(2)-Dy(1)-N(5)	138.99(12)
		6	
Tb(1)-O(4)	2.294(3)	Tb(1)-O(10)	2.336(3)
Tb(1)-O(7)	2.304(3)	Tb(1)-O(1)	2.318(3)
Tb(1)-N(1)	2.564(4)	Tb(1)-N(2)	2.574(4)
Tb(1)-N(6)	2.574(4)	Tb(1)-N(5)	2.599(4)
O(4)-Tb(1)-O(7)	98.25(12)	O(4)-Tb(1)-O(10)	91.31(12)
O(4)-Tb(1)-O(1)	143.64(10)	O(7)-Tb(1)-O(10)	141.70(12)
O(7)-Tb(1)-O(1)	94.72(11)	O(1)-Tb(1)-O(10)	99.20(11)
O(4)-Tb(1)-N(1)	75.43(11)	O(4)-Tb(1)-N(2)	76.74(11)
O(7)-Tb(1)-N(1)	77.22(11)	O(7)-Tb(1)-N(2)	141.15(12)
O(1)-Tb(1)-N(1)	74.59(10)	O(1)-Tb(1)-N(2)	71.96(12)
O(10)-Tb(1)-N(1)	140.92(12)	O(10)-Tb(1)-N(2)	77.14(12)
O(4)-Tb(1)-N(6)	139.88(12)	O(4)-Tb(1)-N(5)	76.13(11)
O(7)-Tb(1)-N(6)	75.61(13)	O(7)-Tb(1)-N(5)	72.87(12)
O(1)-Tb(1)-N(6)	76.31(11)	O(1)-Tb(1)-N(5)	140.23(11)
O(10)-Tb(1)-N(6)	73.38(14)	O(10)-Tb(1)-N(5)	73.66(11)
N(1)-Tb(1)-N(6)	137.93(13)	N(1)-Tb(1)-N(5)	134.73(11)
N(1)-Tb(1)-N(2)	64.16(12)	N(6)-Tb(1)-N(5)	64.08(12)
N(6)-Tb(1)-N(2)	131.95(12)	N(2)-Tb(1)-N(5)	139.23(12)

Table S2 The lifetimes (τ) of Eu(III) in $Dy_{0.80}Eu_{0.20}$, $Gd_{0.90}Eu_{0.10}$ and $Pr_{0.80}Eu_{0.20}$ doped complexes.

Complex	$Dy_{0.80}Eu_{0.20}$	$Gd_{0.90}Eu_{0.10}$	$Pr_{0.80}Eu_{0.20}$
Lifetime value/ms	0.348	0.339	0.202

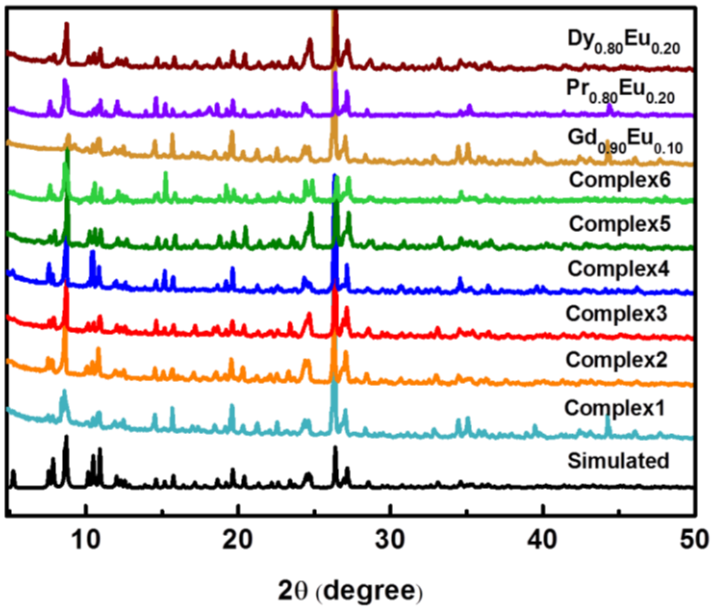

Fig. S1 The PXRD patterns for **1-6** and the $Gd_{0.90}Eu_{0.10}$, $Pr_{0.80}Eu_{0.20}$ and $Dy_{0.80}Eu_{0.20}$ doped complexes.

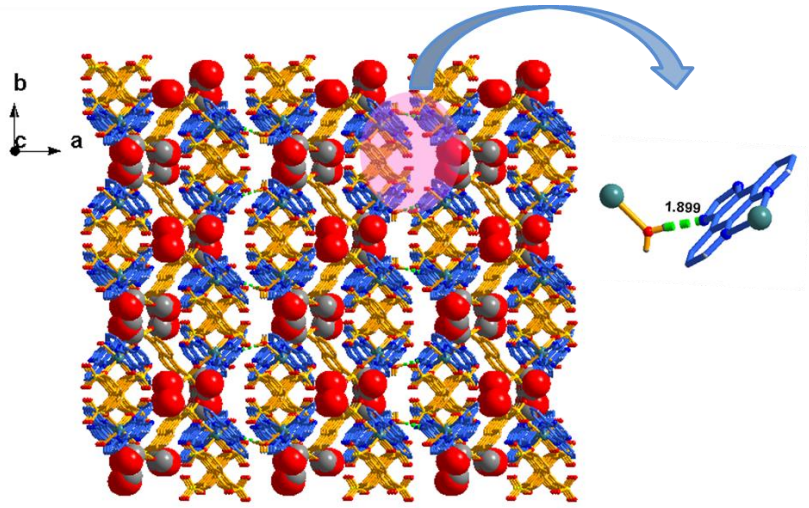

Fig. S2 3D supermolecule structure by hydrogen bonds. The free water molecules present in the cavity.

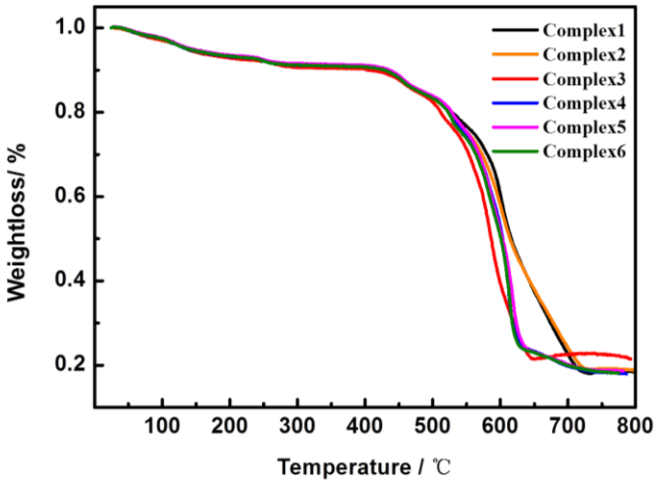

Fig. S3 The TGA curves of **1-6.**

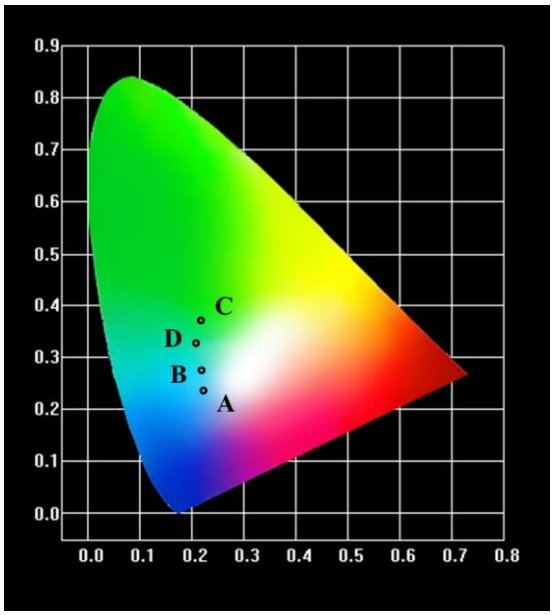

Fig. S4 The CIE chromaticity diagram of complexes **1**, **4-6** (A(0.218,0.231) for **1**, B(0.211, 0.288) for **4**, C(0.211, 0.374) for **5** and D(0.208, 0.340) for **6**).

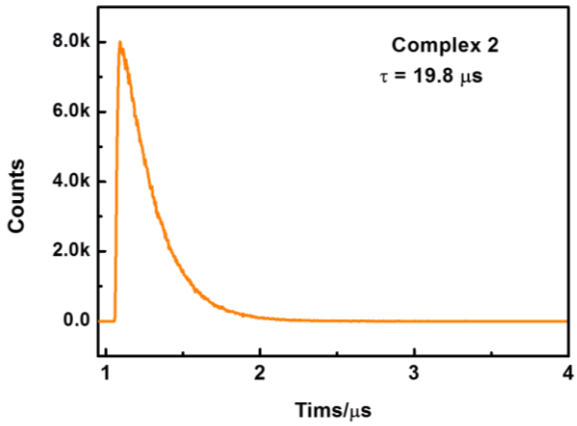

Fig. S5 Decay profile of Sm(III) in complex **2.**

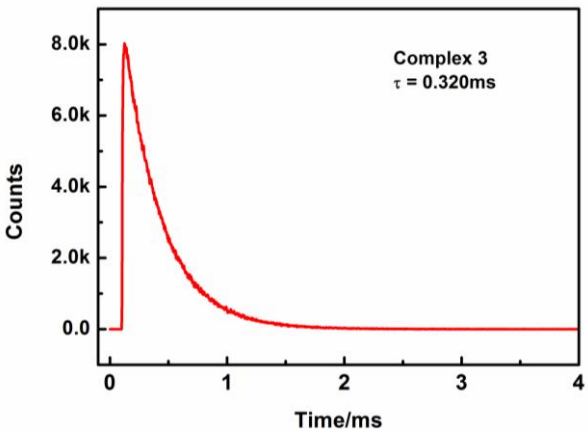

Fig. S6 Decay profile of Eu(III) in complex **3.**

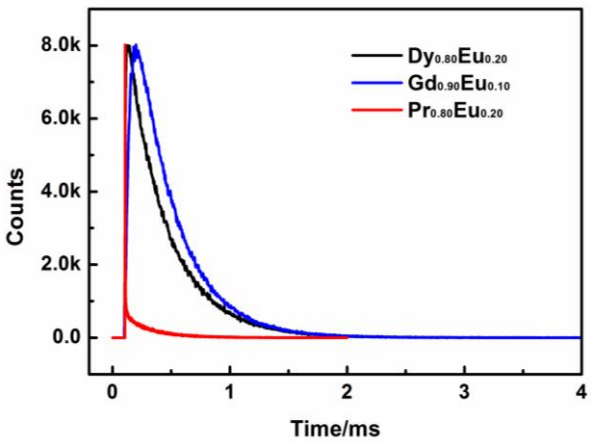

Fig. S7 Decay profile of Eu(III) in $Dy_{0.80}Eu_{0.20}$, $Gd_{0.90}Eu_{0.10}$ and $Pr_{0.80}Eu_{0.20}$ doped complexes.