2D lanthanide coordination polymers constructed by a semi-rigidity tricarboxylic acid ligand: crystal structure, luminescence sensing and color tuning

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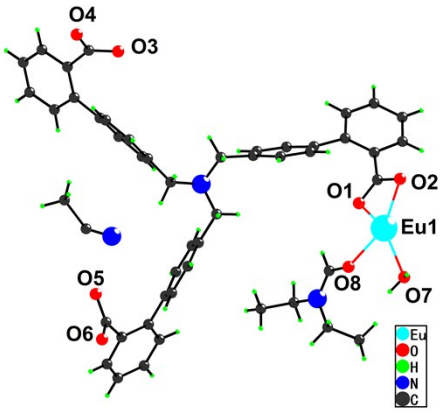


Figure. S1 Asymmetric unit of Complex **1**

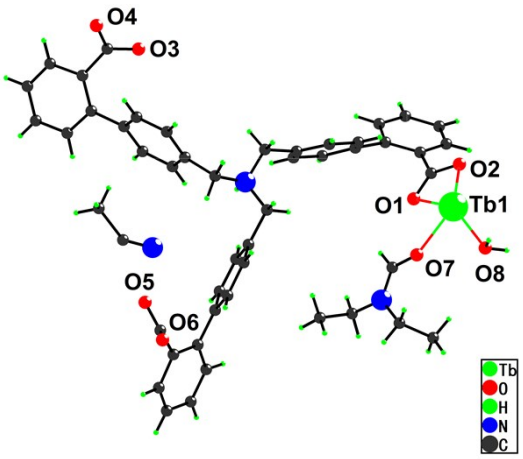


Figure. S2 Asymmetric unit of Complex **2**

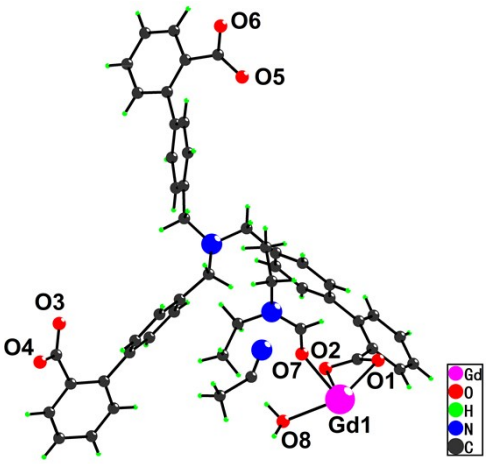
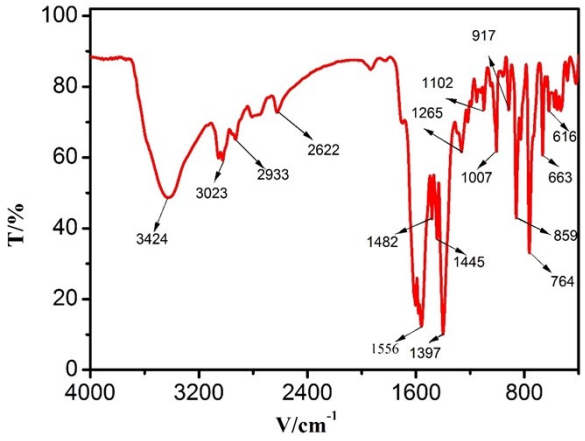


Figure. S3 Asymmetric unit of Complex **3**

(a)



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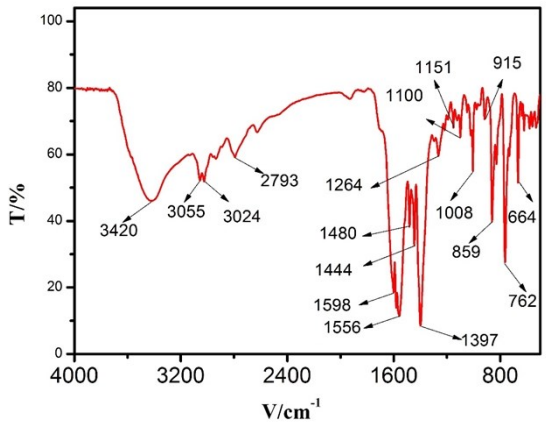

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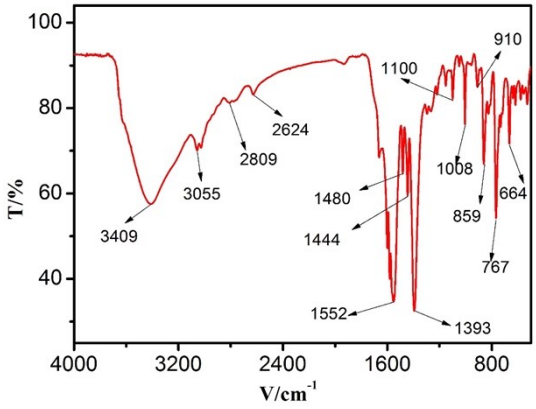


Figure. S4 The FT-IR spectra of complexes **1-3**

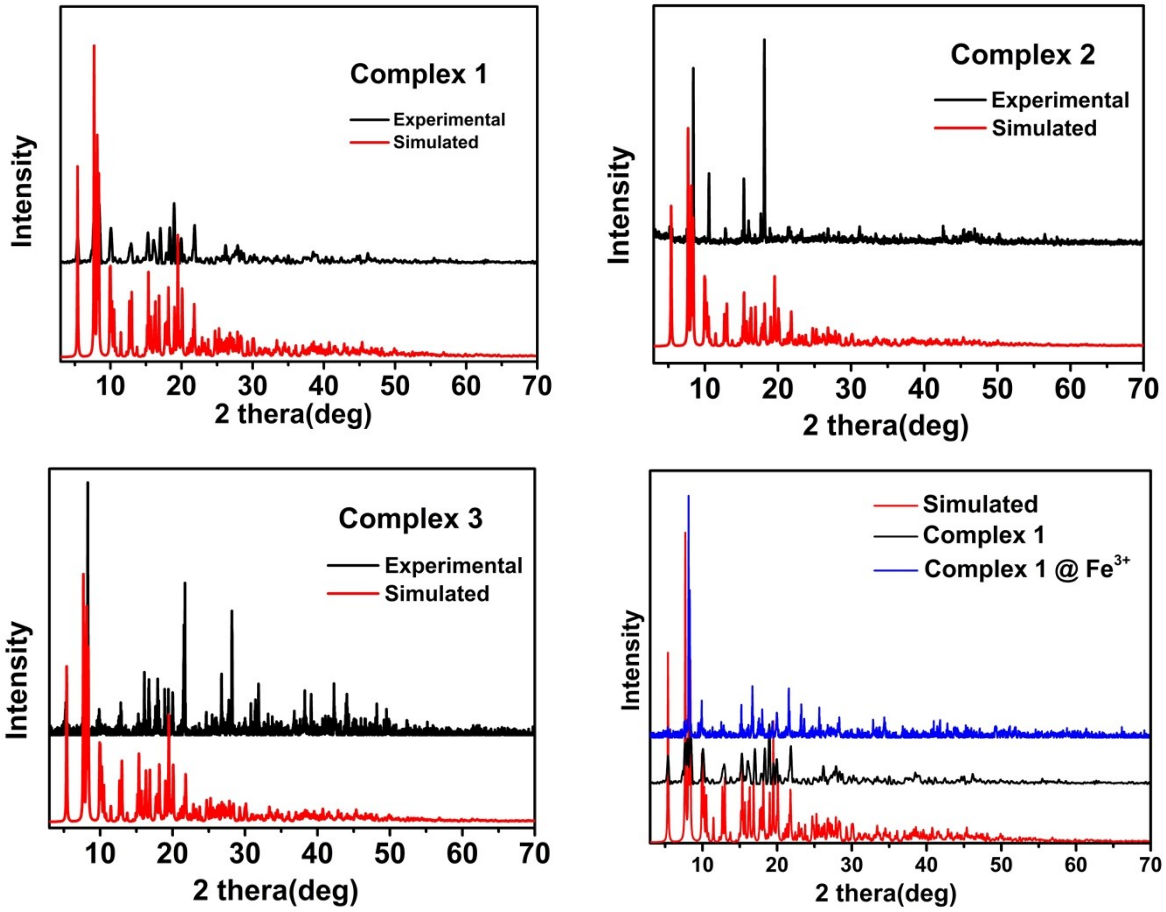


Figure. S5 Simulated (bottom) and experimental (top) powder X-ray diffraction patterns of **1-3** and XRD pattern of the product obtained after dispersing complex **1** into Fe^{3+} CH_3OH solutions of 1.0×10^{-2} mol·L^{-1}

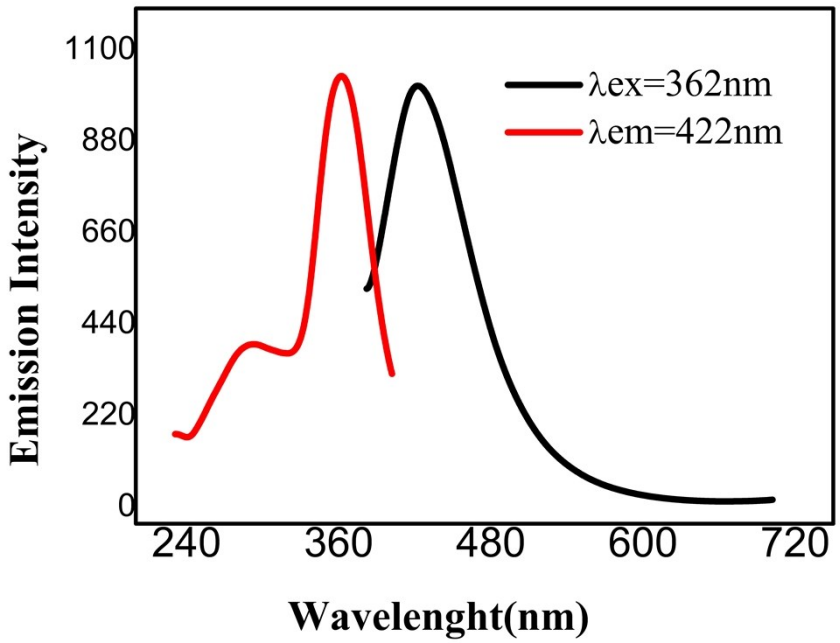
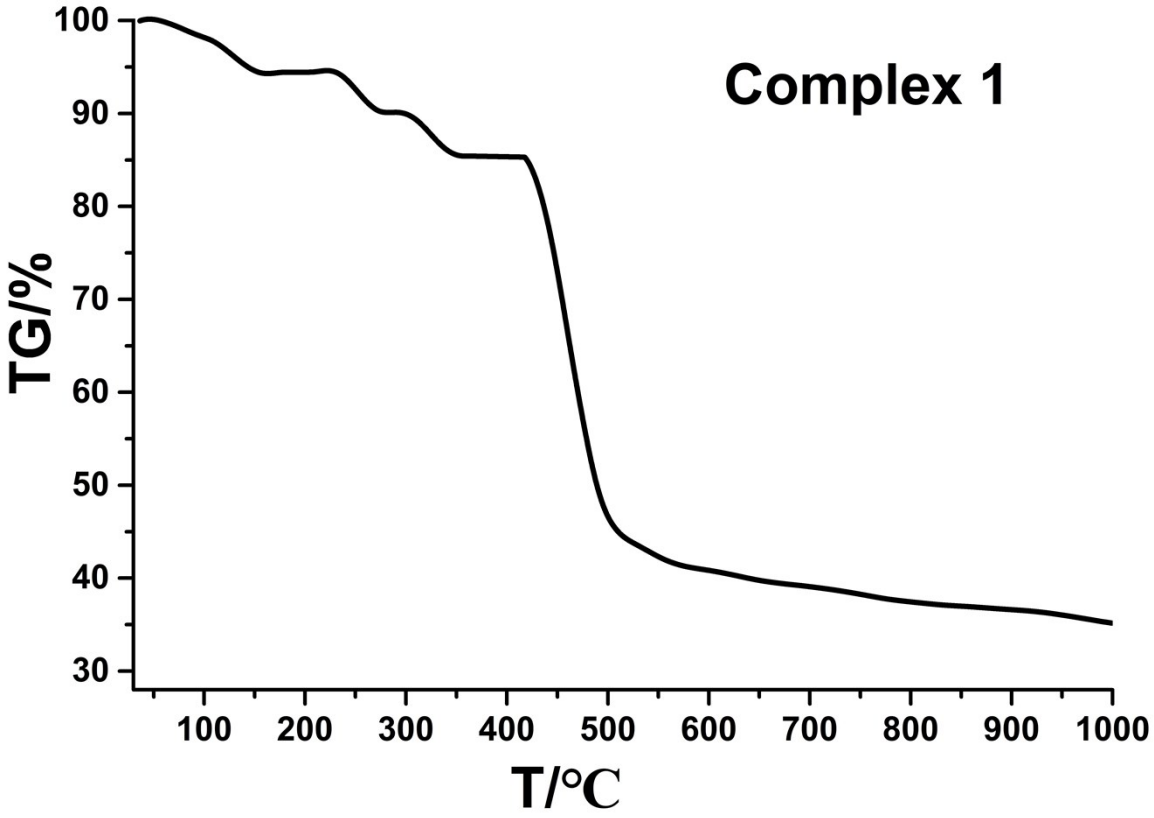
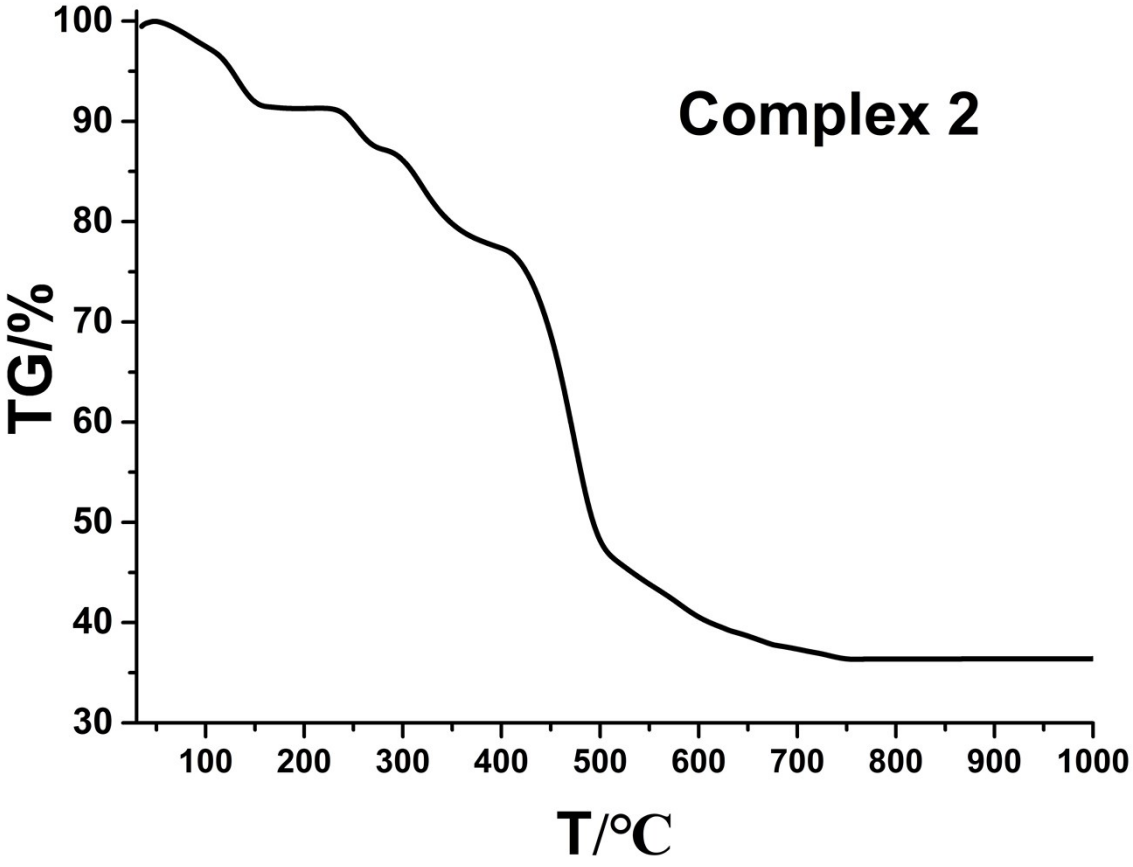


Figure. S6 Solid-state emission spectra of free H_3TMCA


Complex 1
TG/%
T/°C
100
90
80
70
60
50
40
30
100
200
300
400
500
600
700
800
900
1000


Complex 2
TG/%
T/°C
100
90
80
70
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50
40
30
100
200
300
400
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600
700
800
900
1000

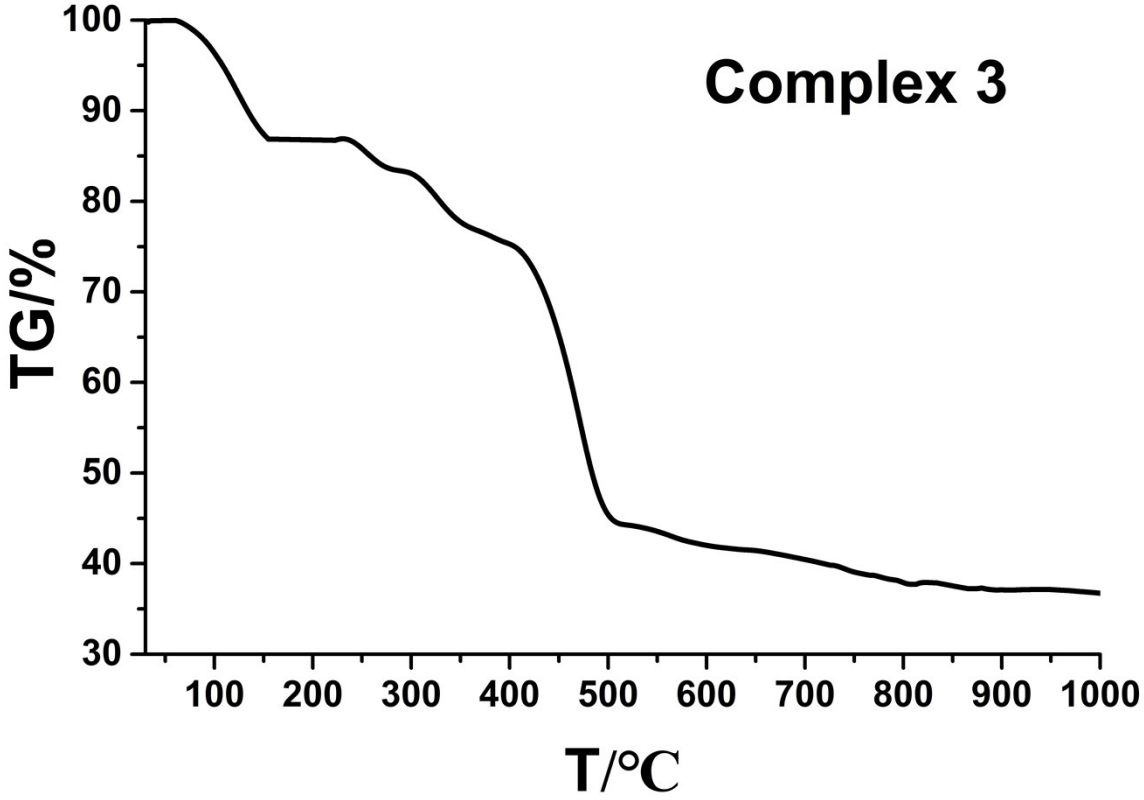

Figure. S7 TGA curves of complexes **1-3**.

Table. S1 Selected Bond Lengths (Å) and Bond Angles (deg) for 1-3

Complex **1**			
Eu1—O1	2.528 (3)	O1—Eu1—O4^{i}	124.68 (8)
Eu1—O2	2.463 (3)	O2—Eu1—O1	52.32 (8)
Eu1—O3^{i}	2.427 (2)	O2—Eu1—O4^{i}	75.31 (8)
Eu1—O4^{i}	2.760 (3)	O2—Eu1—O5^{iii}	133.43 (8)
Eu1—O4^{ii}	2.375 (2)	O3^{i}—Eu1—O1	126.75 (9)
Eu1—O5^{iii}	2.508 (3)	O3^{i}—Eu1—O2	82.87 (9)
Eu1—O6^{iii}	2.425 (3)	O3^{i}—Eu1—O4^{i}	49.37 (7)
Eu1—O7	2.426 (3)	O4^{ii}—Eu1—O6^{iii}	156.51 (9)
Eu1—O8	2.348 (3)	O4^{ii}—Eu1—O1	82.62 (9)
Complex **2**			
Tb1—O1	2.507 (3)	O1—Tb1—O4^{i}	124.71 (8)
Tb1—O2	2.427 (2)	O2—Tb1—O1	52.95 (8)
Tb1—O3^{i}	2.389 (2)	O2—Tb1—O4^{i}	74.81 (8)
Tb1—O4^{ii}	2.338 (3)	O2—Tb1—O5^{iii}	133.28 (8)

Tb1—O4^{i}	2.802 (3)	O3^{i}—Tb1—O1	126.78 (8)
Tb1—O5^{iii}	2.484 (3)	O3^{i}—Tb1—O2	82.02 (9)
Tb1—O6^{iii}	2.398 (3)	O3^{i}—Tb1—O4^{i}	48.96 (8)
Tb1—O7	2.318 (3)	O3^{i}—Tb1—O5^{iii}	71.62 (9)
Tb1—O8	2.395 (3)	O4^{ii}—Tb1—O1	82.52 (9)
Complex **3**			
Gd1—O1	2.415 (3)	O1—Gd1—O2	53.27 (9)
Gd1—O2	2.499 (3)	O1—Gd1—O3^{i}	72.29 (9)
Gd1—O3^{i}	2.419 (3)	O1—Gd1—O4^{i}	119.15 (9)
Gd1—O4^{i}	2.759 (3)	O1—Gd1—O5^{iii}	74.70 (9)
Gd1—O4^{ii}	2.366 (3)	O1—Gd1—O6^{iii}	82.73 (9)
Gd1—O8	2.410 (3)	O3^{i}—Cd1—O4^{i}	54.07 (9)
Gd1—O7	2.333 (3)	O3^{i}—Gd1—O2	71.27 (9)
Gd1—O5^{iii}	2.524 (3)	O3^{i}—Gd1—O4^{i}	49.32 (8)
Gd1—O6^{iii}	2.448 (3)	O4^{ii}—Gd1—O1	156.35 (10)

Symmetry transformations used to generate equivalent atoms in complex (**1**): (i) -*x*+1, -*y*+4, -*z*; (ii) *x*, *y*, *z*-1; (iii) -*x*+1, -*y*+3, -*z*; (**2**(i) -*x*+1, -*y*+2, -*z*+2; (ii) *x*, *y*, *z*-1; (iii) -*x*+1, -*y*+1, -*z*+2; (**3**): (i) *x*, *y*-1, *z*; (ii) -*x*+1, -*y*+1, -*z*+1; (iii) -*x*+1, -*y*+1, -*z*;

Table. S2

MOF-based chemsensor	Analyst	Concentration mg^{-1} mL^{-1}	LOD/μM	$K_{SV}10^4/M^{-1}$	Ref.
$[Eu_2(2,3'\text{-oba})_3(phen)_2]_n$	Fe^{3+}	0.66	7.93	1.37	1
$[Zn_2(cptpy)(btc)(H_2O)]_n$	Fe^{3+}	1.66	4.33	0.5456	2
$\{[Zn_3(HL)_2H_2O]\cdot 4H_2O\}_n$	Fe^{3+}	-	220	50	3
$\{Zn_2(NO_3)_2(4,4'\text{-bpy})_2(TBA)\}$	Fe^{3+}	1	7.18	0.748	4
$[Cd_2(btc)(bib)(HCOO)(H_2O)\cdot H_2O]_n$	Fe^{3+}	-	1.56	0.605	5
$\{[Eu(L)(HCOO)]\cdot H_2O\}_n$	Fe^{3+}	1.5	1	0.7461	6
$[Pb_{1.5}(DBPT)]_2\cdot(DMA)_3(H_2O)_4$	Fe^{3+}	1	2.5	12	7
$\{[Zn_2(TRZ)_2(DBTDC\text{-}O_2)]\cdot DMAc\}_n$	Fe^{3+}	-	4.61	1.0	8
$[Eu(L_1)(H_2O)]\cdot 1.5H_2O$	Fe^{3+}	-	0.87	6.607	9
$[Tb(TBOT)(H_2O)](H_2O)_4(DMF)(NMP)_{0.5}$	Fe^{3+}	-	130	0.551	10
$\{[Eu(TMCA)(DEF)(H_2O)]\bullet(CH_3CN)\}_n$	Fe^{3+}	2	31	0.184	This Work

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