Supporting Information

Lanthanide hybrids of covalently-coordination cooperative post-functionalized metal-organic frameworks for luminescence tuning and highly-selectively sensing of tetrahydrofuran

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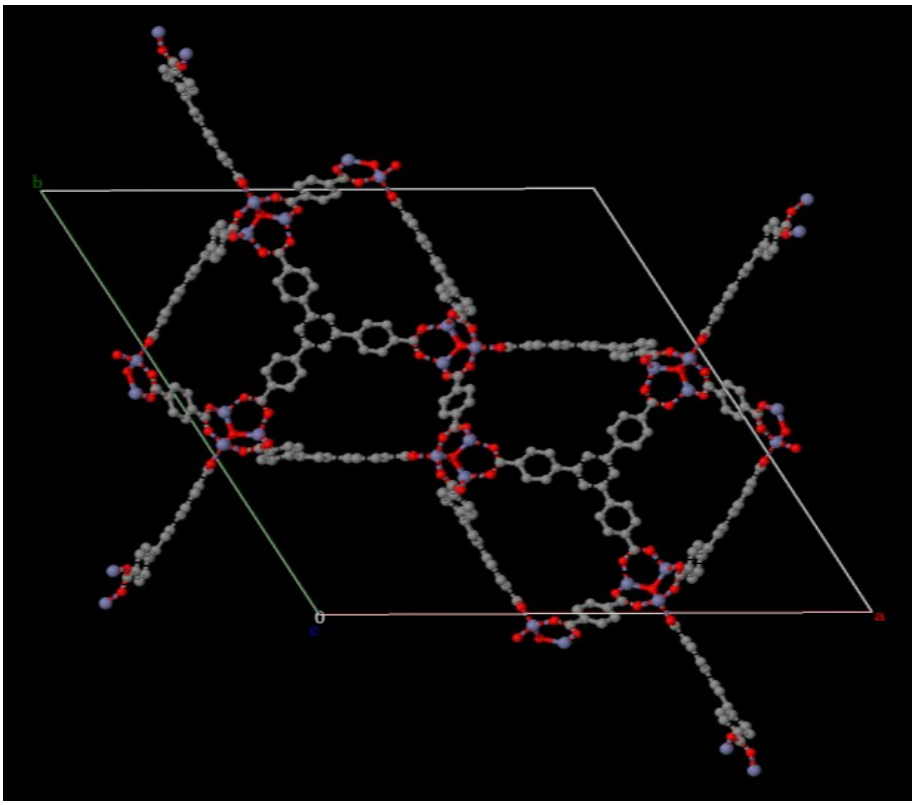

Fig. S1 The crystal structure of UMCM-NH_2 along c axis.

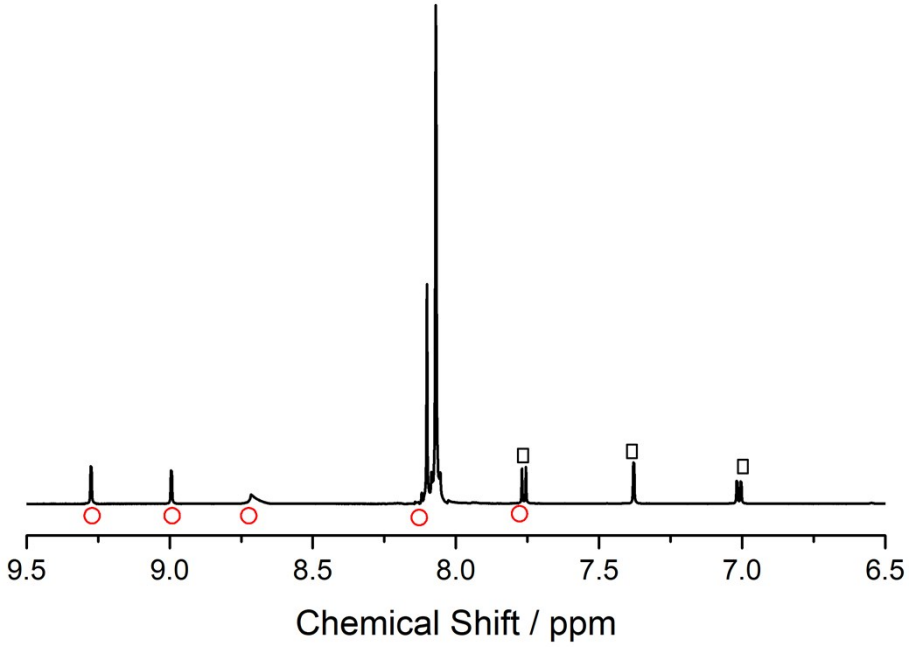

Fig. S2 ^{1}H NMR spectra of digested UMCM-AM (ca. 41% modified). Modified NH_2-BDC and unmodified NH_2-BDC are indicated by red circles and black squares respectively.

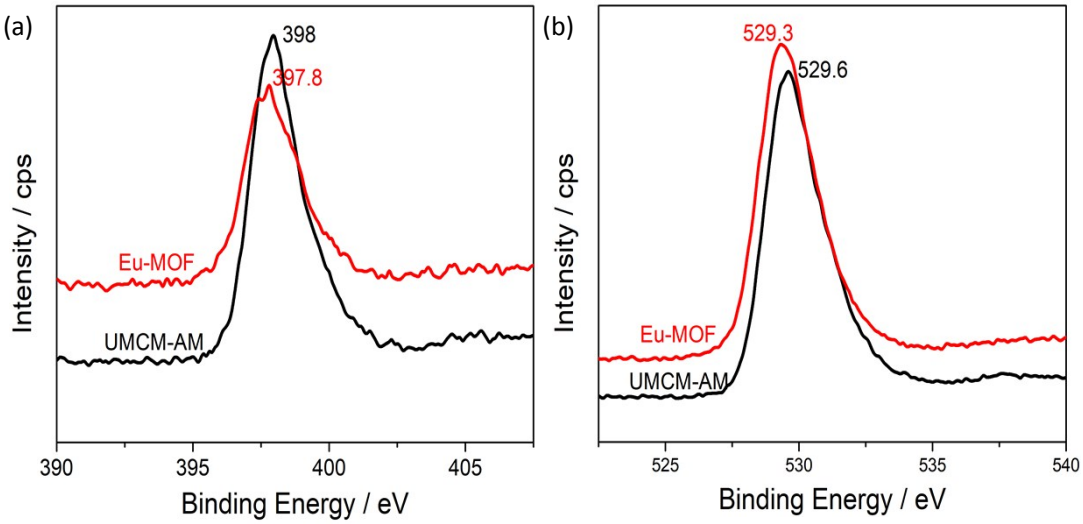

Fig. S3 X-ray photoelectron spectra (XPS) of UMCM-AM (black) and Eu-MOF (red) for N 1s (a), O 1s (b).

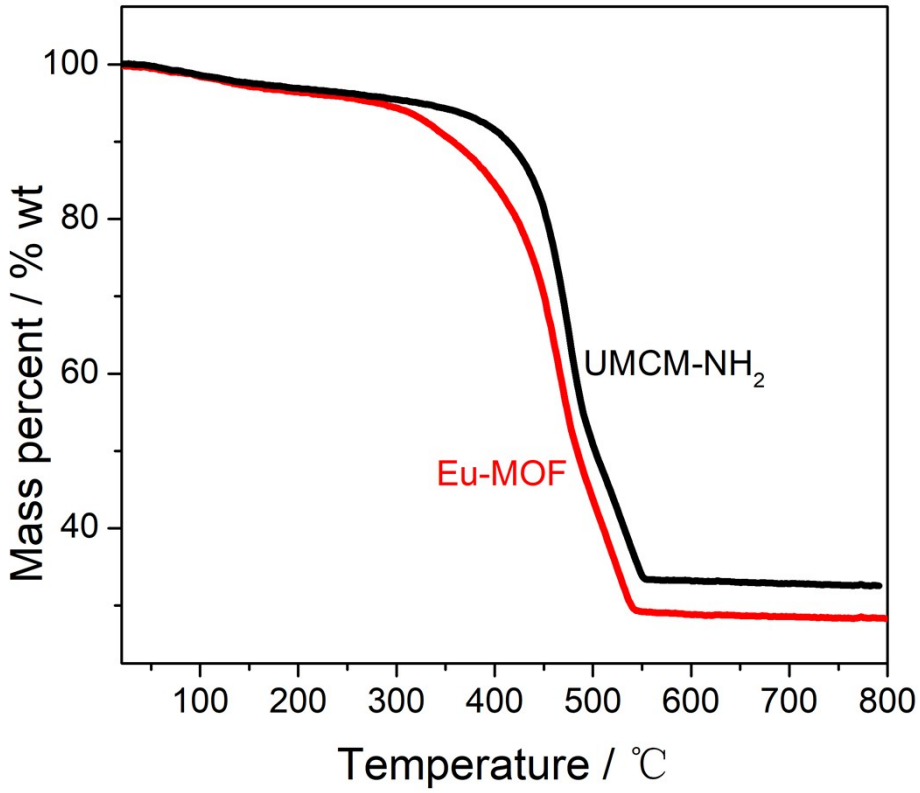

Fig. S4 Thermal gravimetric analysis (TGA) curves of UMCM-NH_2 and Eu-MOF.

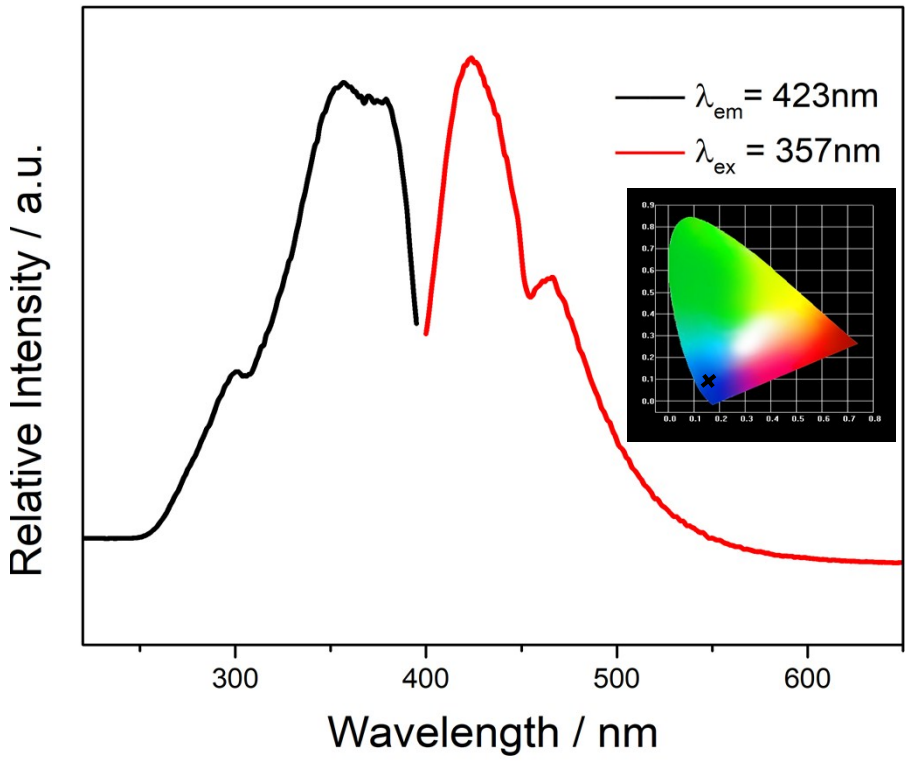

Fig. S5 Excitation and emission spectra of UMCM-AM; the inset is the corresponding CIE digram of UMCM-AM (x = 0.1573, y = 0.0931).

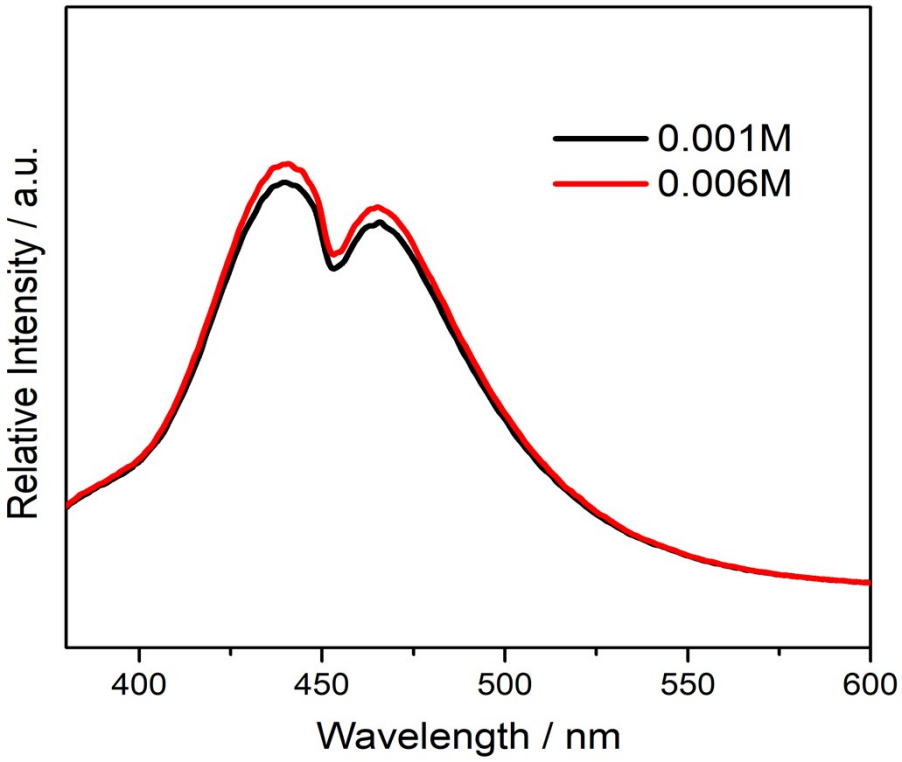

Fig. S6 The emission spectra of UMCM-AM that was modified with different concentration of 2,3-pyrazinedicarboxylic anhydride.

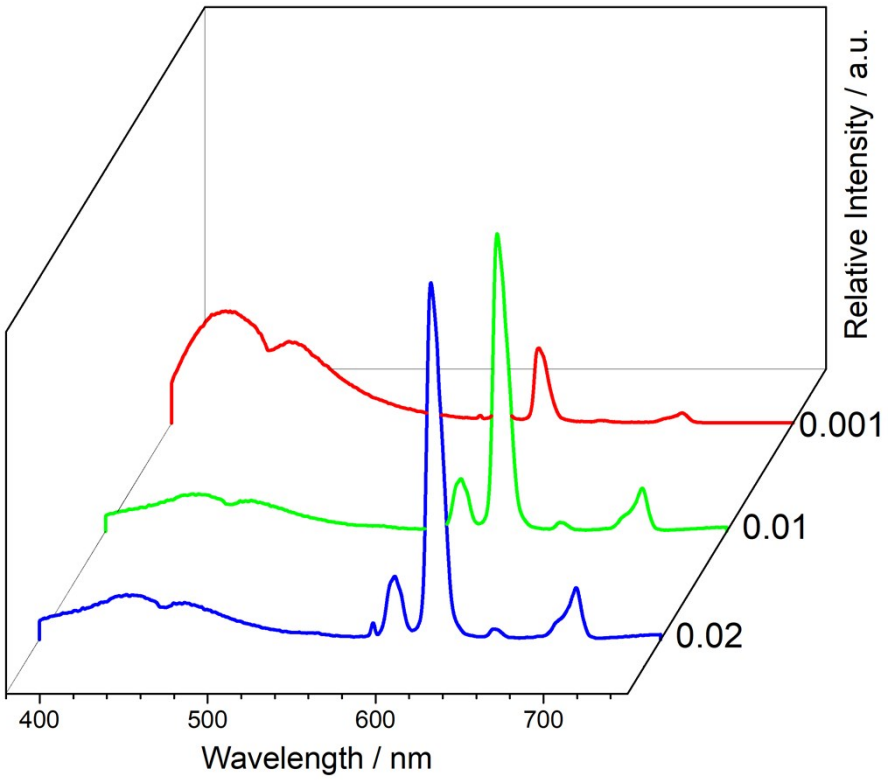

Fig. S7 Emission spectra of Eu-MOF when UMCM-AM was immersed in the different concentration (mol L^{-1}) of $Eu(acac)_3 \cdot 3H_2O$.

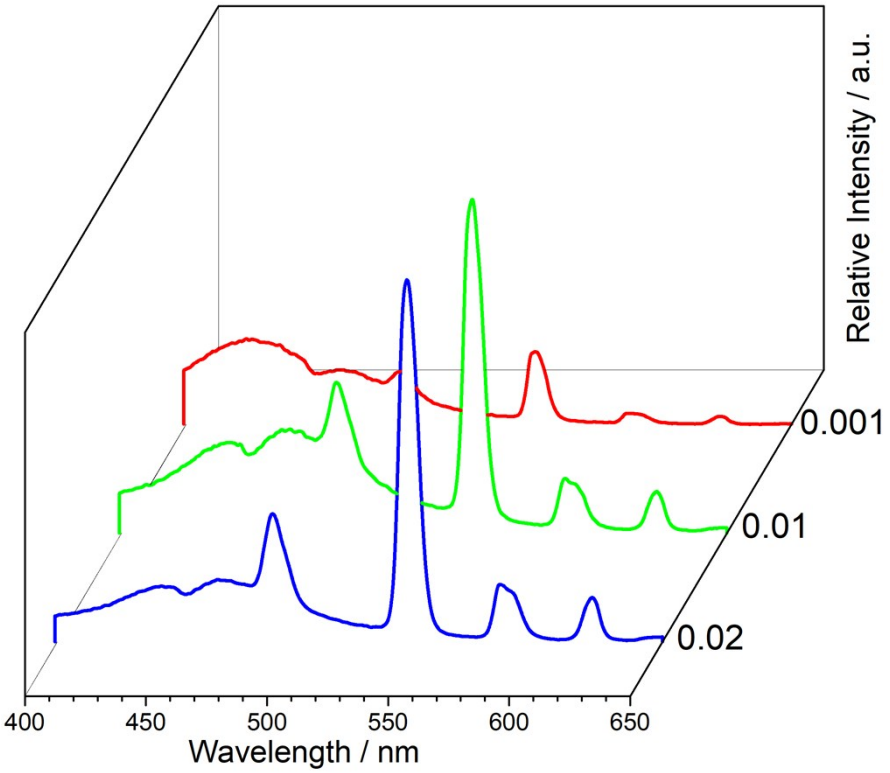

Fig. S8 Emission spectra of Tb-MOF when UMCM-AM was immersed in the different concentration (mol L^{-1}) of $Tb(acac)_3 \cdot 3H_2O$.

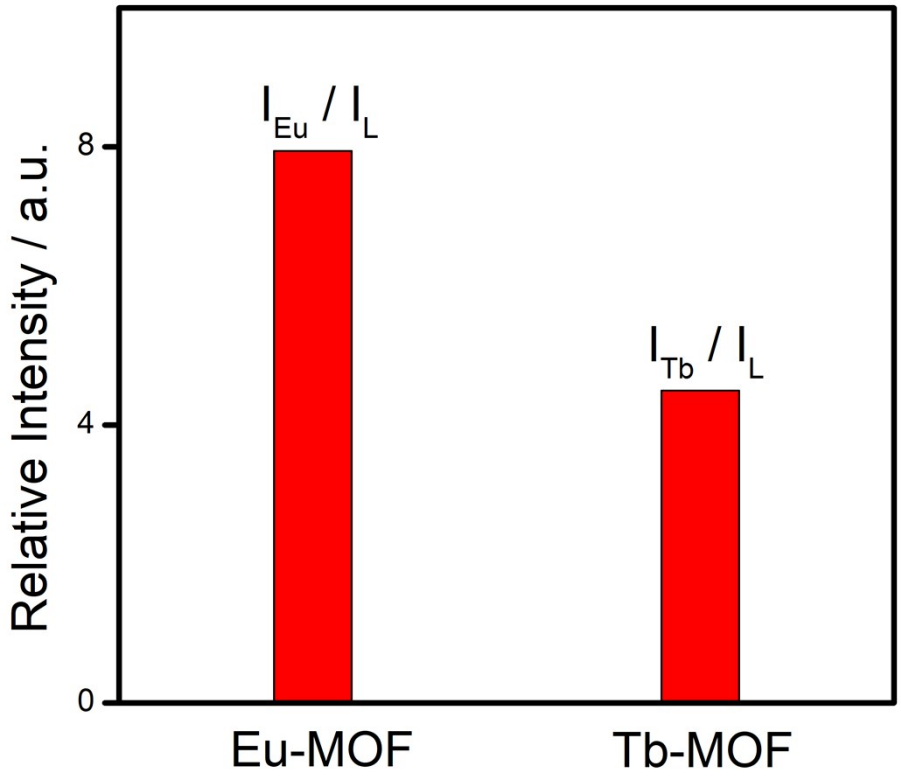

Fig. S9 The values of I_{Ln}/I_L (Ln = Eu, Tb) that were obtained at the same condition.

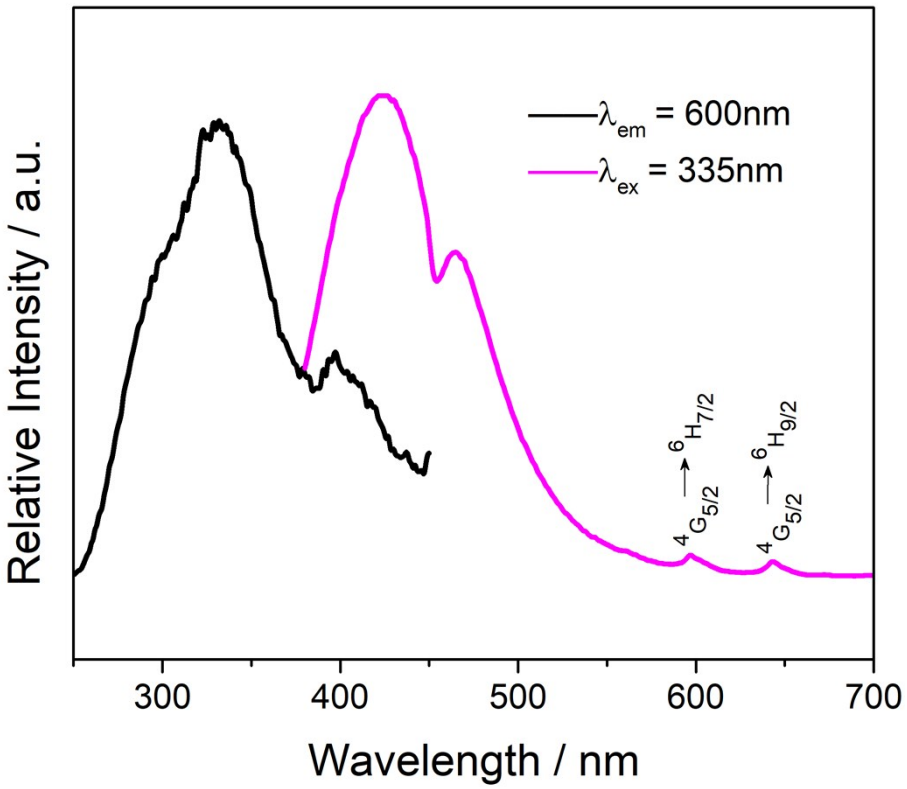

Fig. S10 Excitation (black line) and emission spectra of Sm-MOF.

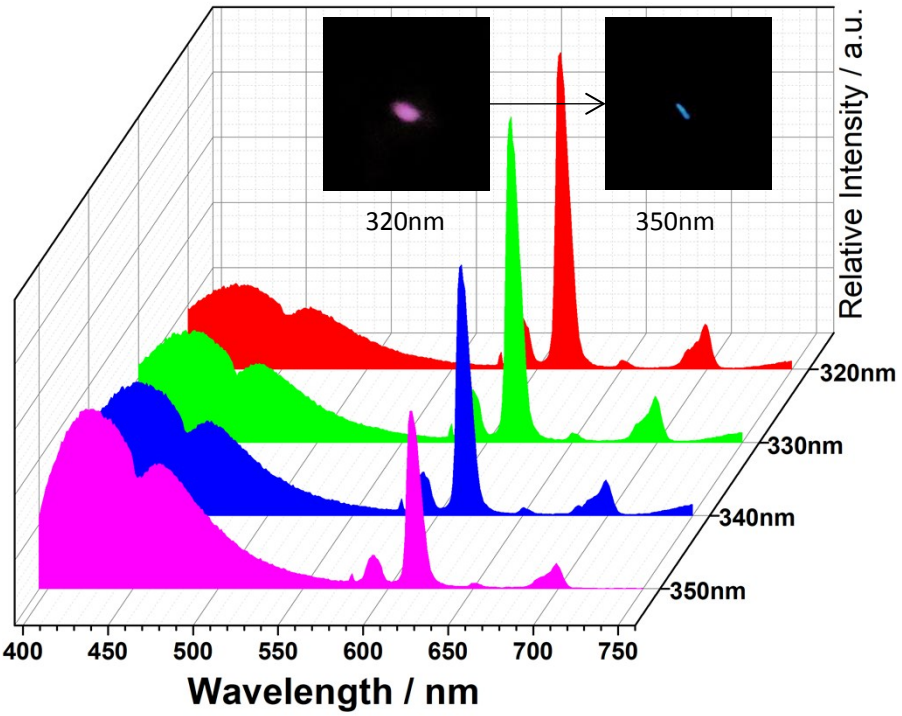

Fig. S11 Emission spectra of Eu-MOF obtained at different excitation wavelength. The insets are corresponding photographs.

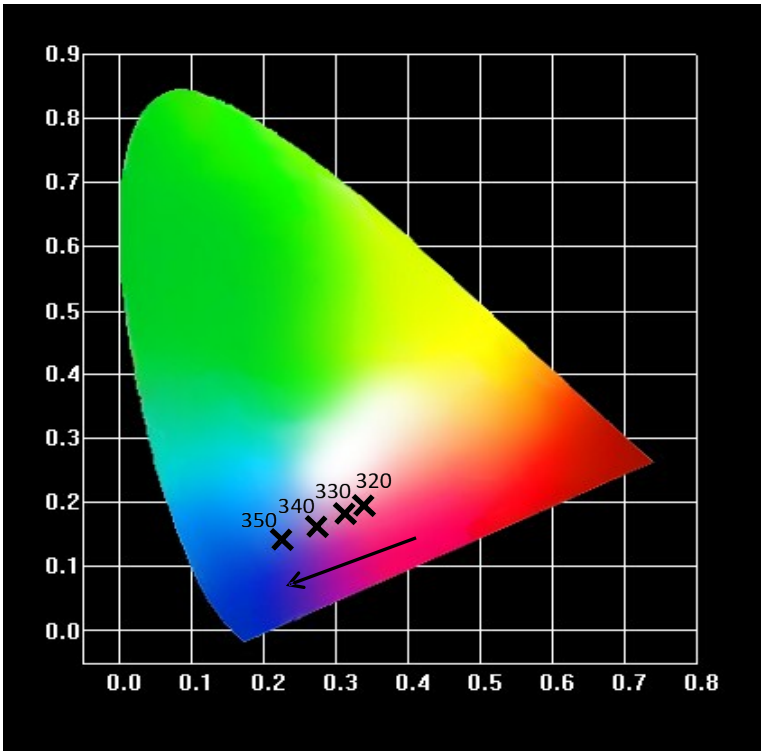

Fig. S12 CIE diagrams of emission spectra of Eu-MOF obtained at different excitation wavelength (nm).

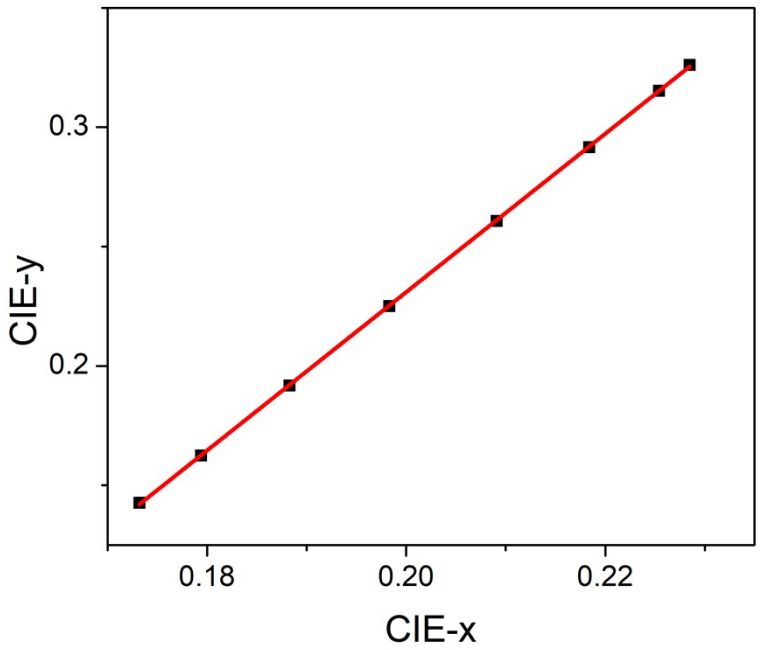

Fig. S13 The linear relationship of the chromaticity coordinates (x, y) of Tb-MOF luminescence spectra obtained at different excitation wavelength between320 and 355 nm (5 nm increment).

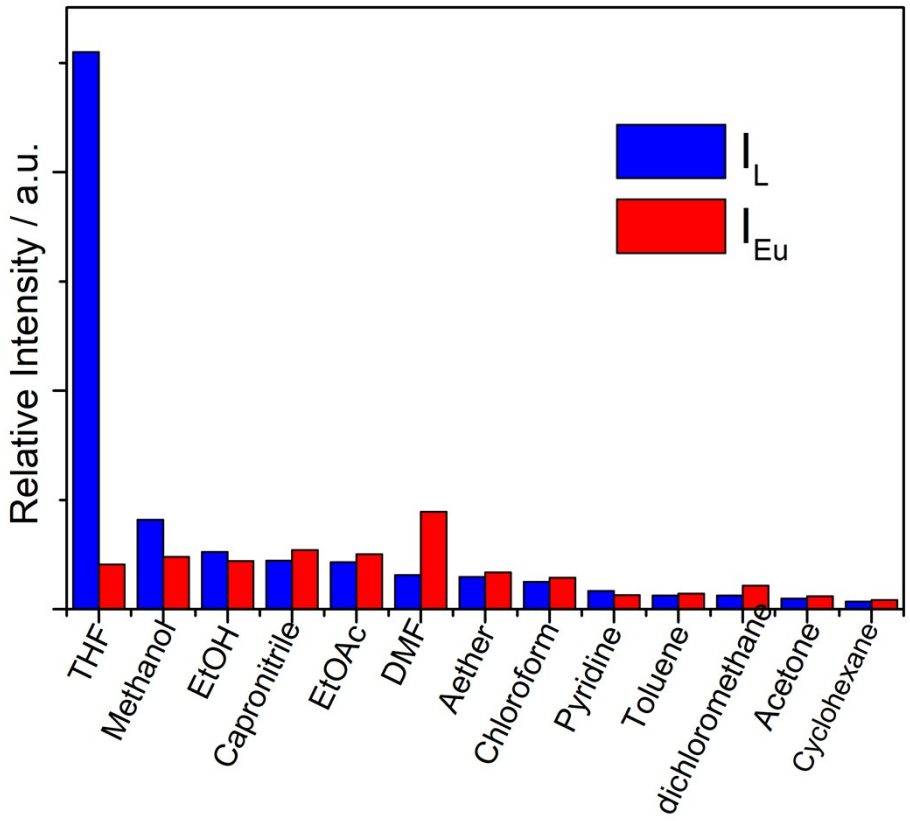

Fig. S14 Luminescence intensity (I_L and I_{Eu}) of Eu-MOF dispersed into different organic molecules

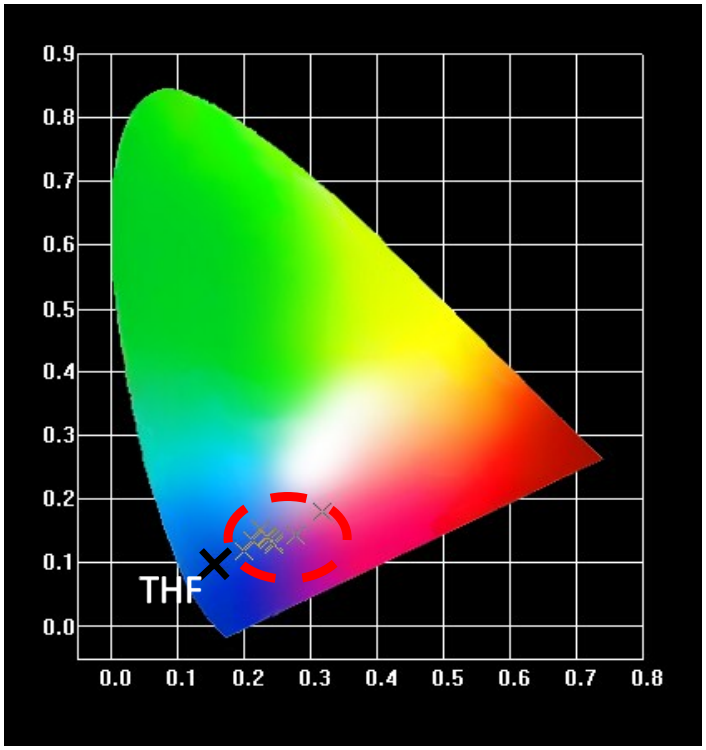

Fig. S15 The CIE diagrams of Eu-MOF dispersed into different organic molecules.

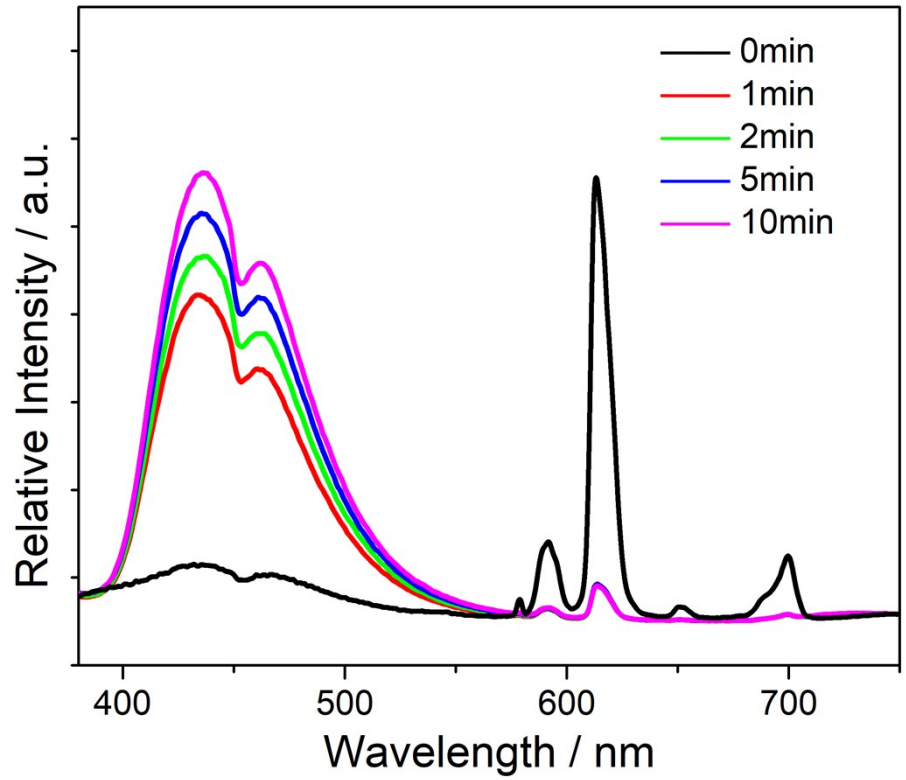

Fig. S16 Emission spectra of Eu-MOF immersed in THF at various time intervals (λ_{ex}=328 nm).

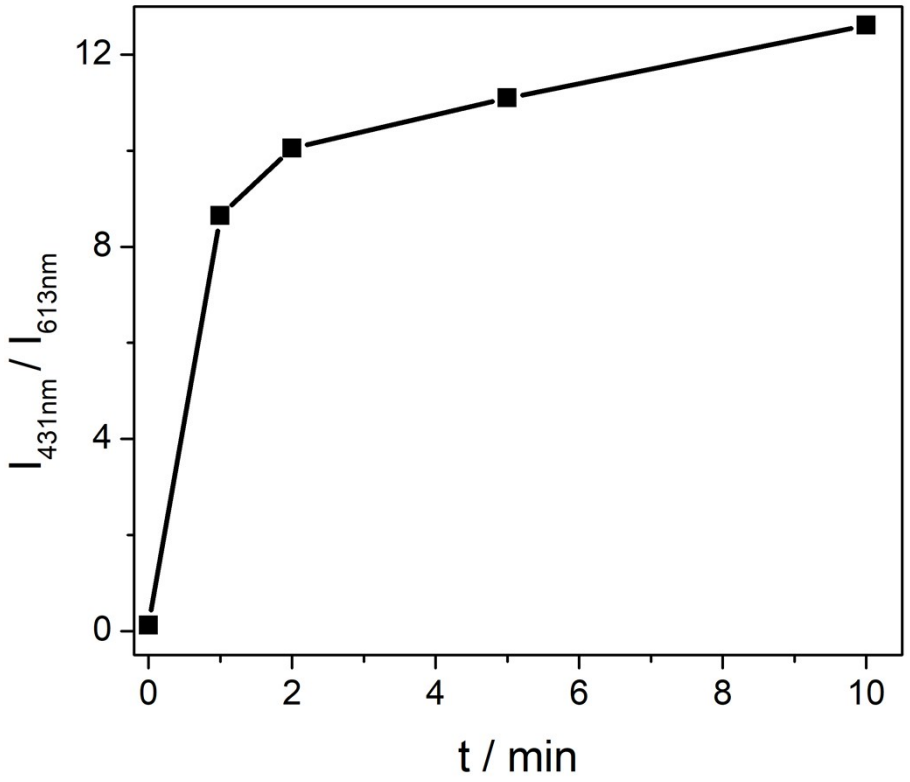

Fig. S17 The values of I_L/I_{Eu} of Eu-MOF dispersed in THF as a function of immersed time.

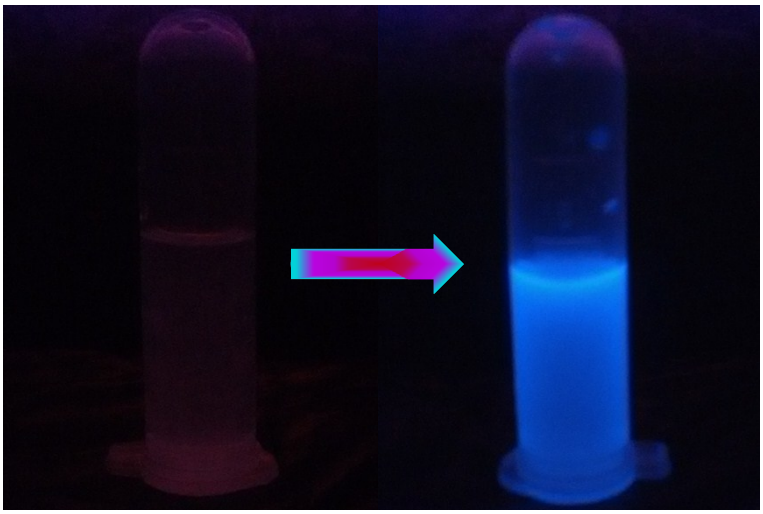

Fig. S18 The photographs of DMF suspensions under UV-light irradiation with different THF content: 0% (left), (50%) right.

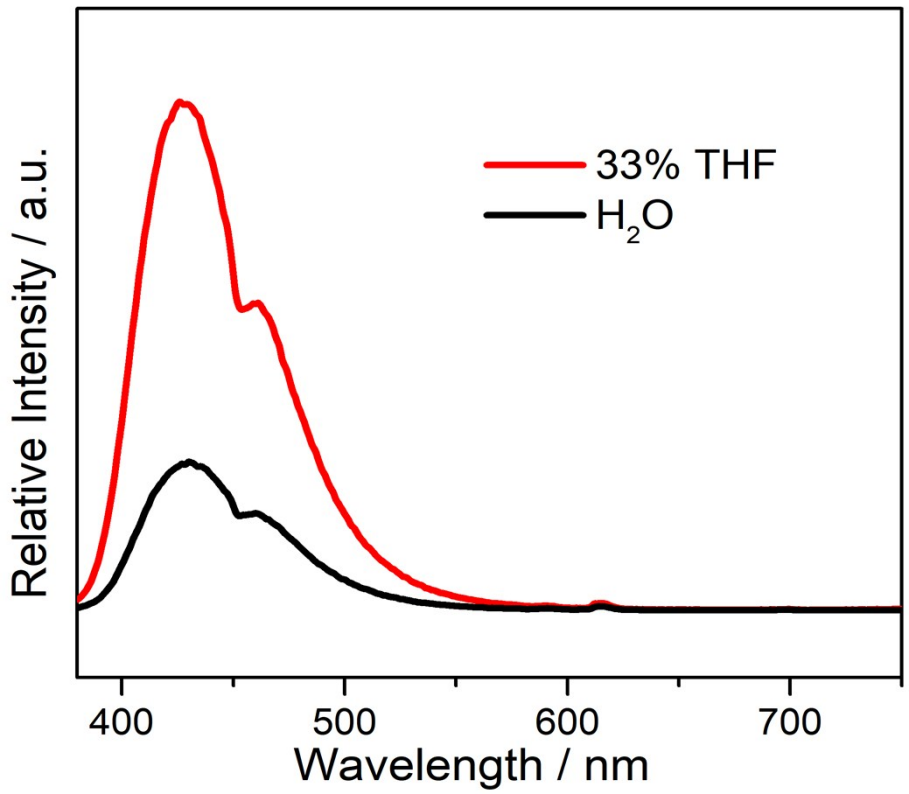

Fig. S19 Emission spectra of Eu-MOF when it was immersed in H_2O and 33%THF.

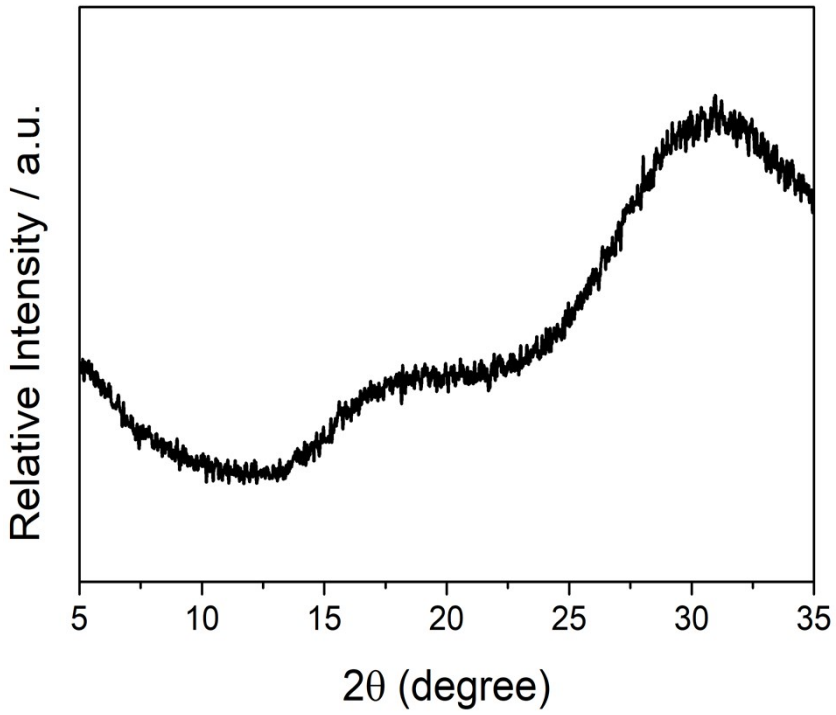

Fig. S20 The PXRD patterns of Eu-MOF after being immersed in THF and washed with $CHCl_3$.

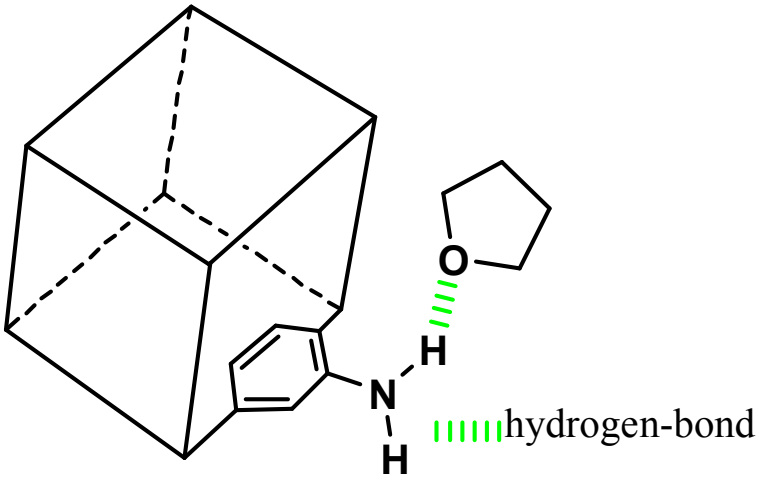

Fig. S21 One kind of possible hydrogen -bond types between ligands and THF.

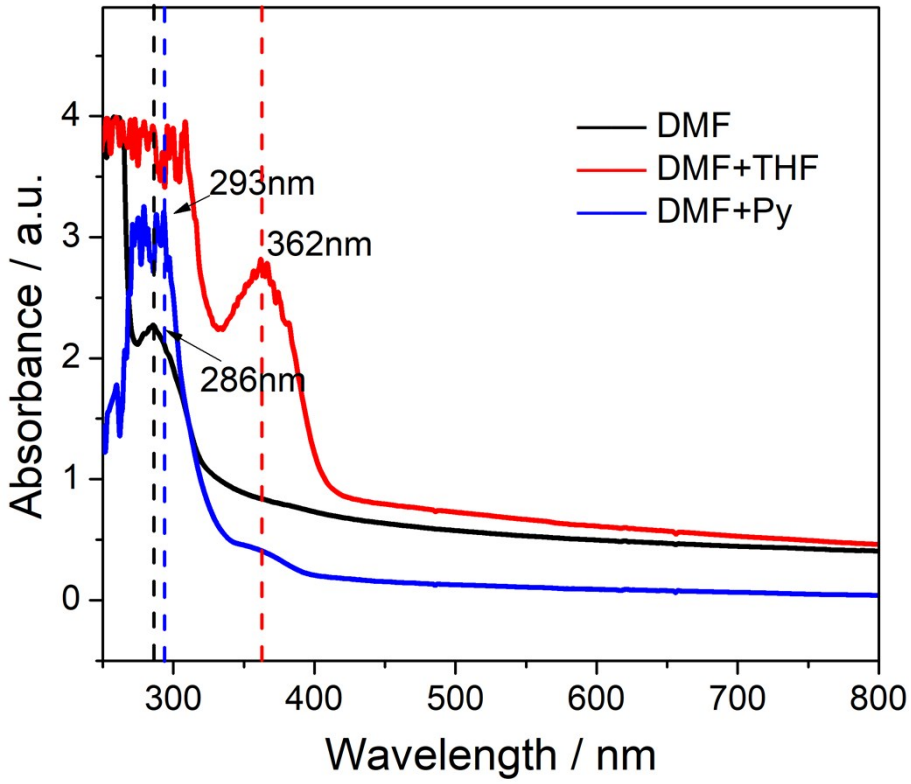

Fig. S22 UV-Vis adsorption spectra of suspended Eu-MOF (black) in DMF, Eu-MOF (red) in THF/DMF and Eu-MOF (blue) in Pyridine/DMF solution (DMF as reference solvent).

Table S1 The ICP-MS results of the content of Eu/Tb ion in the corresponding MOFs

MOF	Eu (ppm)	Tb (ppm)	Zn (ppm)	Zn/Eu ratio[a]	Zn/Tb ratio[b]
Eu-MOF	1.638	--	11.07	15.8 : 1	--
Tb-MOF	--	2.013	11.65	--	14.2 : 1
Eu/Tb-MOF	1.224	1.156	12.53	23.9 : 1	26.5 : 1

a: Zn/Eu molar ratio that calculated based on the ICP-MS results.

b: Zn/Tb molar ratio that calculated based on the ICP-MS results.

Table S2 The lifetimes of Eu-MOF immersed in DMF and DMF/THF

	DMF	**DMF/THF**
Eu^{3+} (us)	876	943
Ligands (us)	16	360