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Electronic Supplementary Information for

A multi-responsive luminescent sensor based on a super-stable sandwich-type terbium(III)-organic framework

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Table S1. Selected Bond Lengths (Å) and Angles (º) for **Tb-MOF**.

Tb(1)-O(2)#1	2.312(3)	Tb(1)-O(4)#1	2.329(3)
Tb(1)-O(3)	2.337(3)	Tb(1)-O(1)	2.400(3)
Tb(1)-O(5)#2	2.405(3)	Tb(1)-O(8)	2.413(3)
Tb(1)-O(7)	2.450(3)	Tb(1)-O(6)#2	2.476(3)
O(2)#1-Tb(1)-O(4)#1	71.36(10)	O(2)#1-Tb(1)-O(3)	82.08(11)
O(4)#1-Tb(1)-O(3)	129.55(10)	O(2)#1-Tb(1)-O(1)	124.70(11)
O(4)#1-Tb(1)-O(1)	79.86(10)	O(3)-Tb(1)-O(1)	81.50(11)
O(2)#1-Tb(1)-O(5)#2	79.22(13)	O(3)-Tb(1)-O(5)#2	79.56(11)
O(4)#1-Tb(1)-O(5)#2	132.89(10)	O(8)-Tb(1)-O(6)#2	70.48(10)
O(3)-Tb(1)-O(8)	139.59(10)	O(1)-Tb(1)-O(8)	72.27(10)
O(2)#1-Tb(1)-O(8)	138.22(10)	O(4)#1-Tb(1)-O(8)	75.82(10)
O(5)#2-Tb(1)-O(8)	106.44(12)	O(2)#1-Tb(1)-O(7)	146.82(11)
O(1)-Tb(1)-O(7)	74.35(11)	O(5)#2-Tb(1)-O(7)	74.28(12)
O(4)#1-Tb(1)-O(7)	141.82(10)	O(3)-Tb(1)-O(7)	73.86(10)
O(8)-Tb(1)-O(7)	69.83(10)	O(2)#1-Tb(1)-O(6)#2	82.09(10)
O(4)#1-Tb(1)-O(6)#2	86.15(9)	O(3)-Tb(1)-O(6)#2	132.35(10)
O(1)-Tb(1)-O(6)#2	142.37(10)	O(5)#2-Tb(1)-O(6)#2	53.40(10)
O(1)-Tb(1)-O(5)#2	146.77(11)	O(7)-Tb(1)-O(6)#2	97.39(10)

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

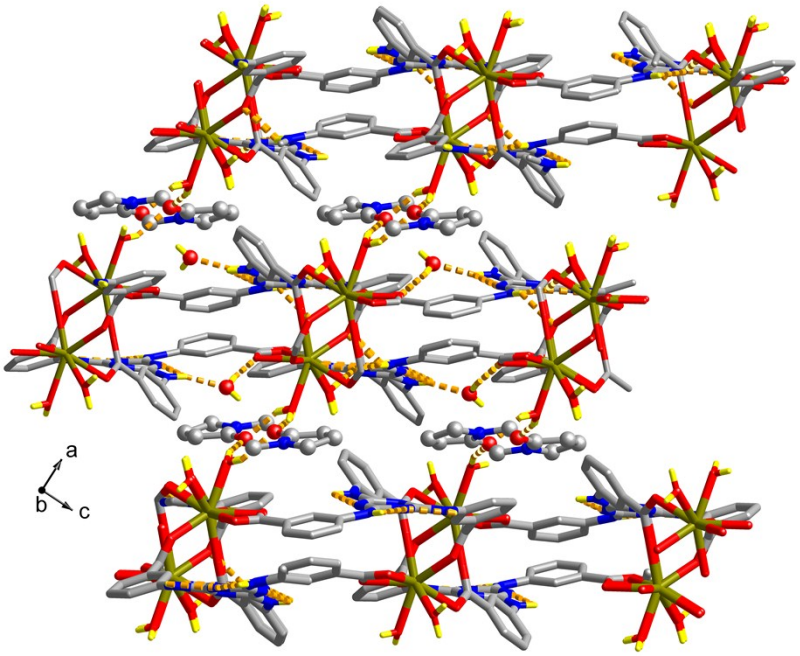

Fig. S1. 3D sandwich-type supramolecular net of **Tb-MOF**. Hydrogen bonds are represented as light orange dash line.

Table S2. Distance (Å) and angles (°) of hydrogen bonding for **Tb-MOF**.

D-H···A	d(D-H)	d(H···A)	d(D···A)	∠(DHA)
O(7)-H(7A)···O(9)#3	0.85	2.041	2.799	148.22
O(7)-H(7B)···O(9)#4	0.85	1.961	2.784	162.62
O(8)-H(8A)···N(3)#5	0.85	1.880	2.704	162.75
O(10)-H(10A)···O5#6	0.850	2.056	2.889	166.48
N(1)-H(1)···O(10)#6	0.860	2.025	2.863	164.60
N(6)-H(6)···O(4)#6	0.860	2.263	2.931	134.55

Symmetry codes: #3, x + 1, y - 1, z; #4, - x + 2, - y + 1, - z; #5, x, y - 1, z; #6, - x + 2, - y + 1, - z.

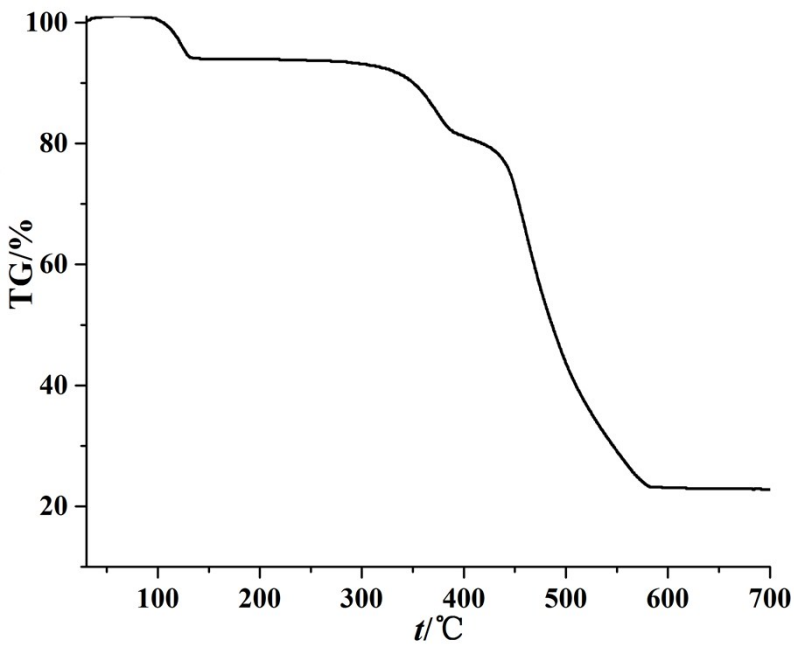

Fig. S2. TGA plot of complexes **Tb-MOF**. For **Tb-MOF**, the first weight loss of 6.9% (calcd. 6.8%) was observed from 92 to 132 °C corresponding to the loss of free and coordinated water molecules. The second weight loss of 12.2% (calcd. 11.9%) might start from 283 to 391 °C, indicating the loss of NMP molecules. Then the framework collapsed in the temperature range 392-582 °C before the final formation of the Tb_2O_3 (calc. 23.0%, exp. 23.2%).

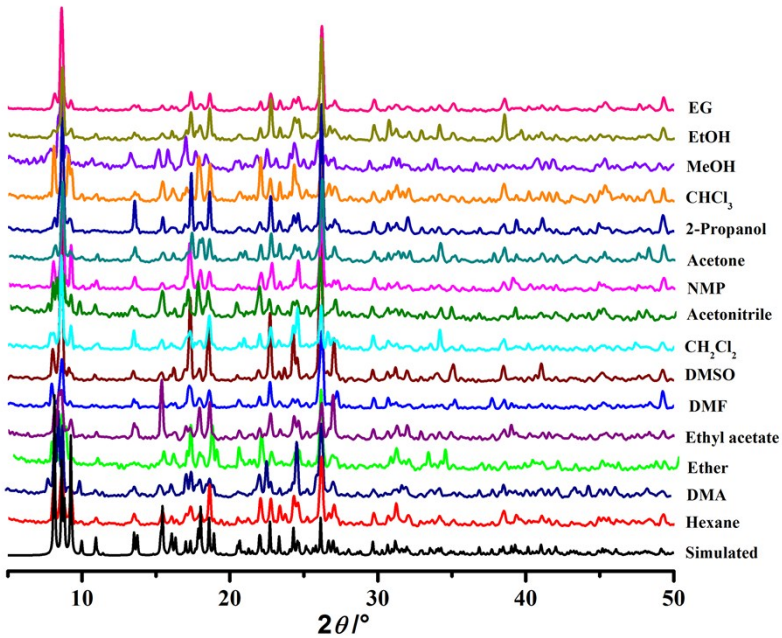

Fig. S3. PXRD patterns of **Tb-MOF**; the simulated, and immersed in organic solvent for one month.

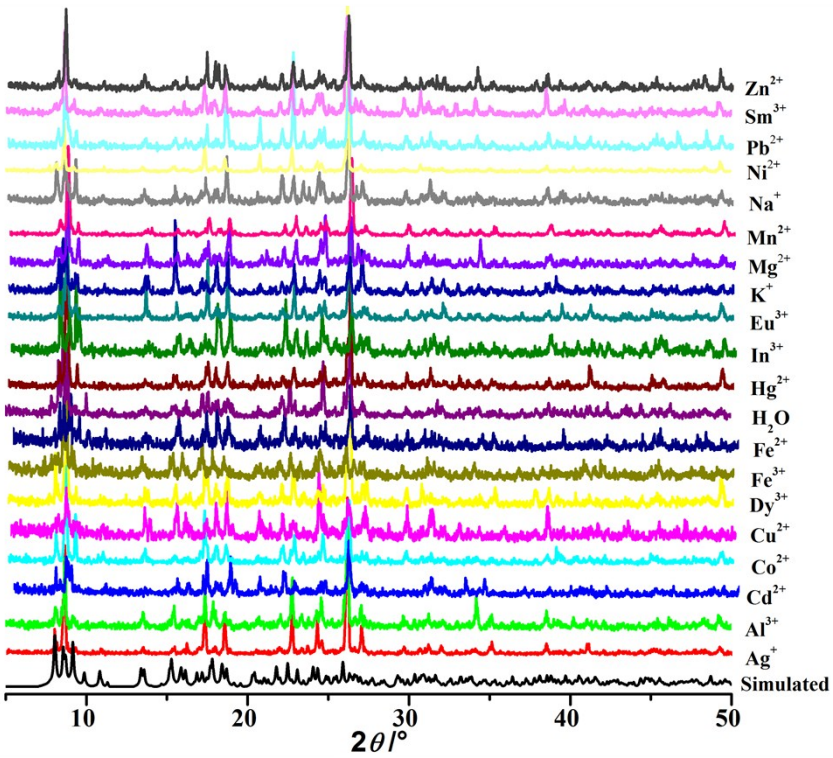

Fig. S4. PXRD patterns of **Tb-MOF**; the simulated, as-synthesized, immersed in H_2O solutions containing different M^{x+} (10^{-2} M) for three days.

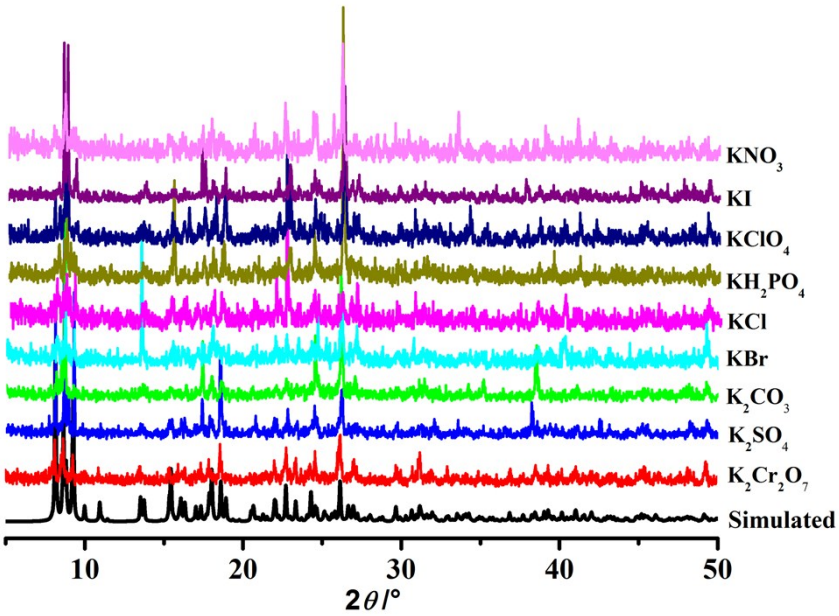

Fig. S5. PXRD patterns of **Tb-MOF**; the simulated, as-synthesized, immersed in H_2O solutions containing different X^{y-} (10^{-2} M) for three days.

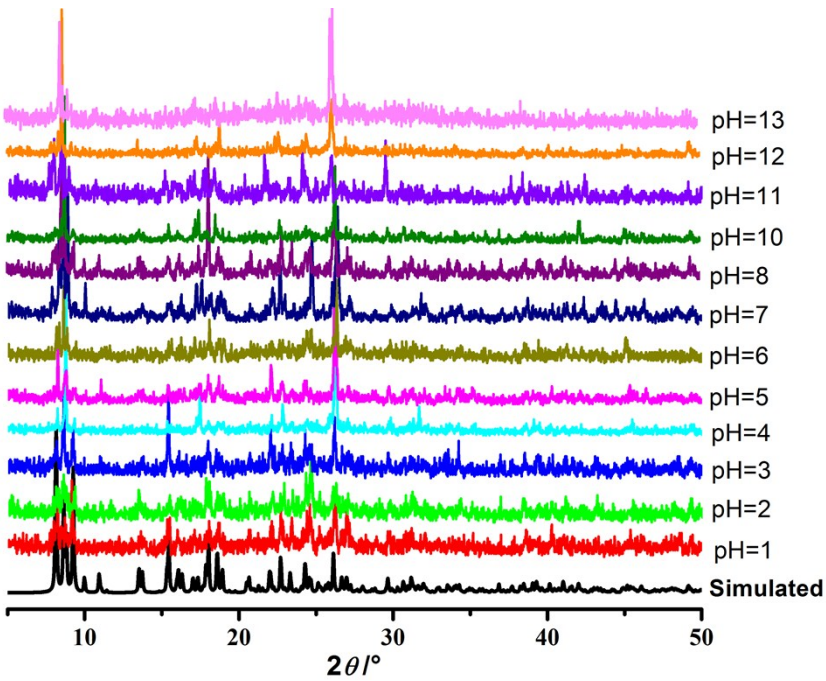

Fig. S6. PXRD patterns of **Tb-MOF**; the simulated, as-synthesized, immersed in H_2O solutions with different pH values.

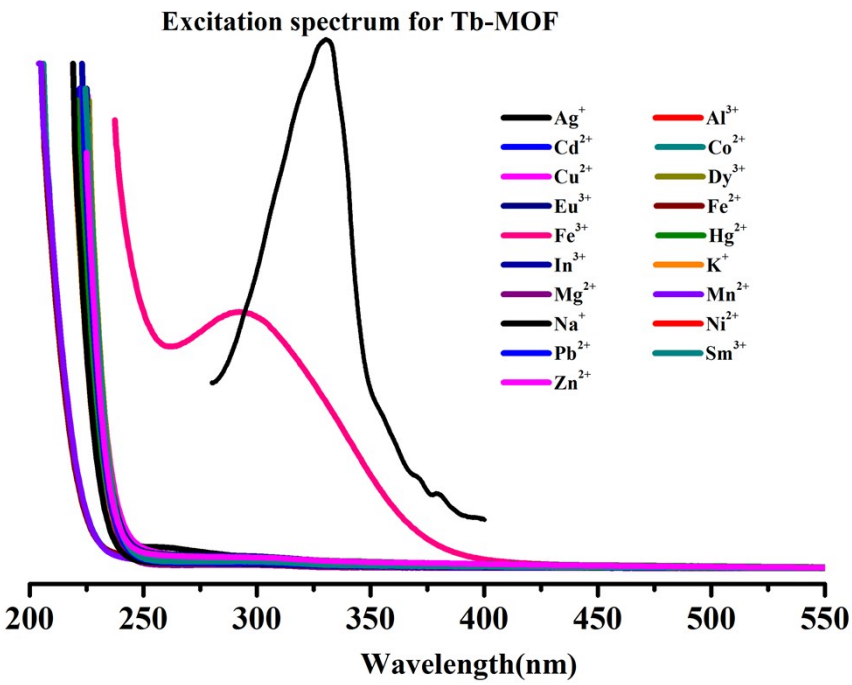

Fig. S7. The UV-vis absorption spectra of metal cations aqueous solution with the same concentration of analytes (0.01 M) and the excitation spectra of **Tb-MOF**.

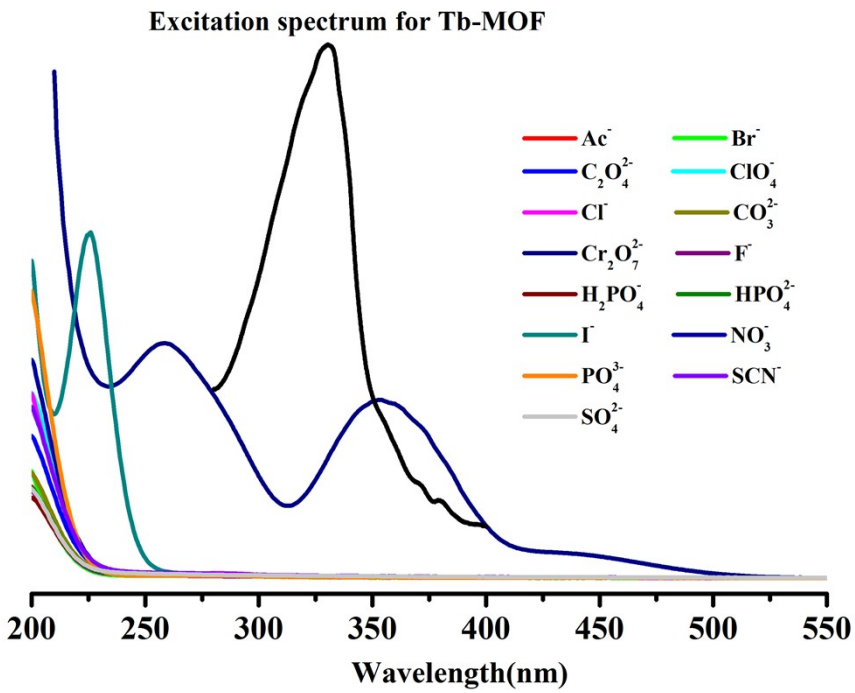

Fig. S8. The UV-vis absorption spectra of inorganic anions aqueous solution with the same concentration of analytes (0.01 M) and the excitation spectra of **Tb-MOF**.

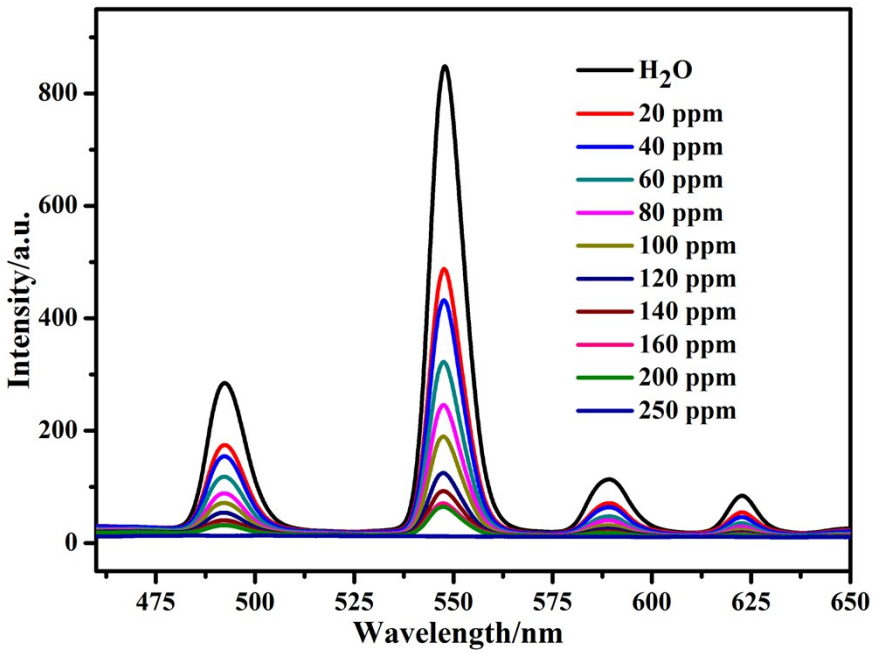

Fig. S9. Luminescence spectra of **Tb-MOF** with 2-NP at different concentrations in water solution.

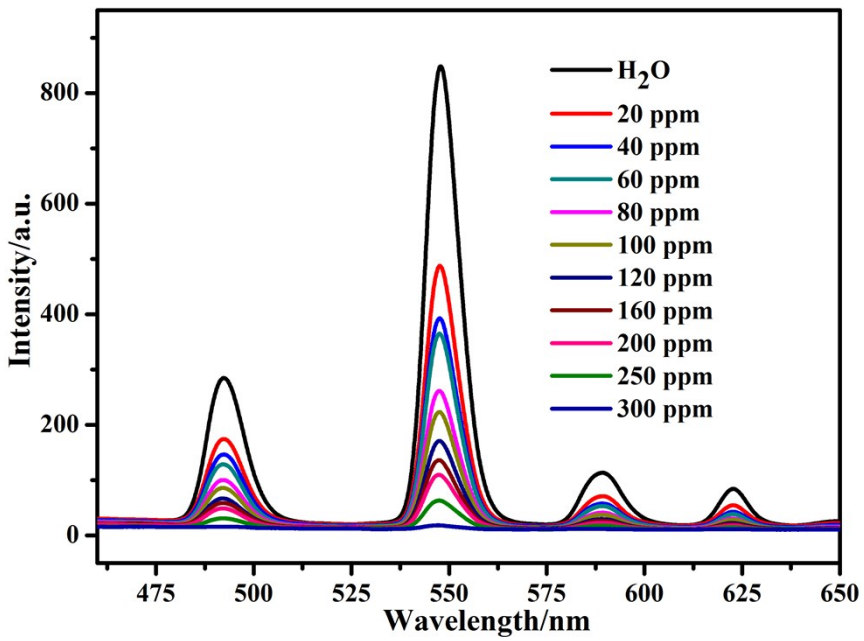

Fig. S10. Luminescence spectra of **Tb-MOF** with 3-NP at different concentrations in water solution.

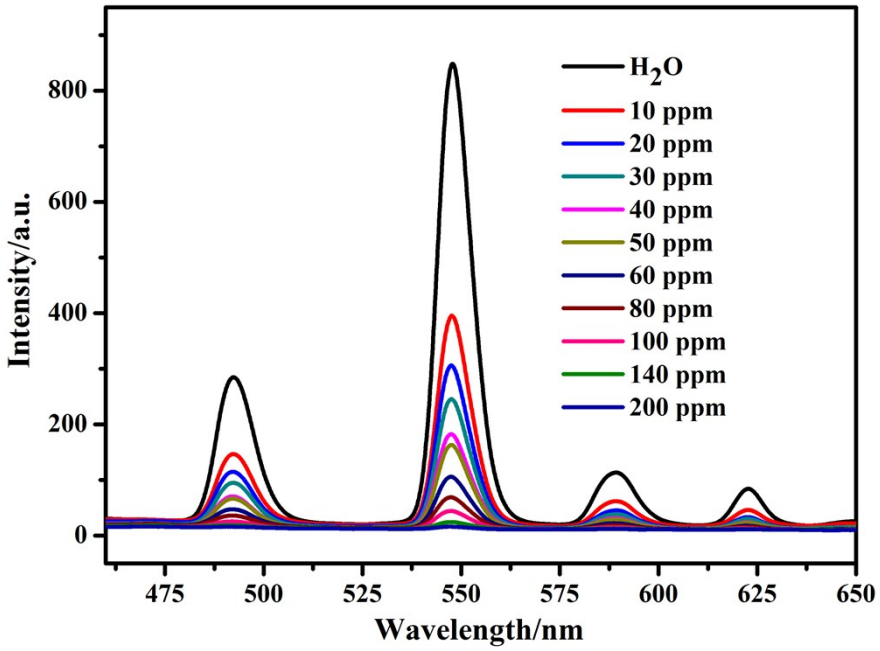

Fig. S11. Luminescence spectra of **Tb-MOF** with 4-NP at different concentrations in water solution.

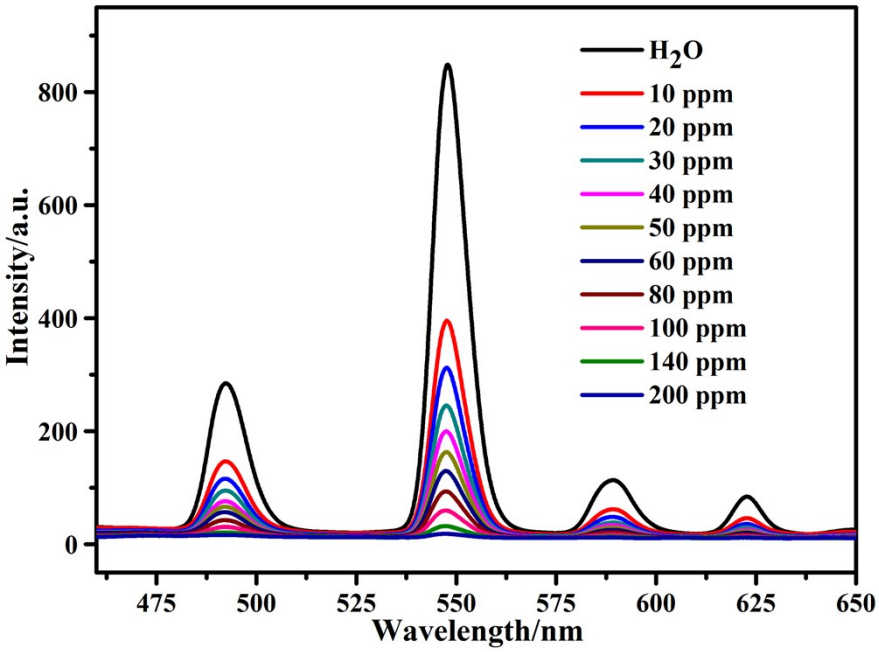

Fig. S12. Luminescence spectra of **Tb-MOF** with TNP at different concentrations in water solution.