Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting information

An In^{III}-based Anionic Metal–Organic Framework: Sensitization of Lanthanide (III) Ions and Selective Absorption and Separation of Cationic Dyes

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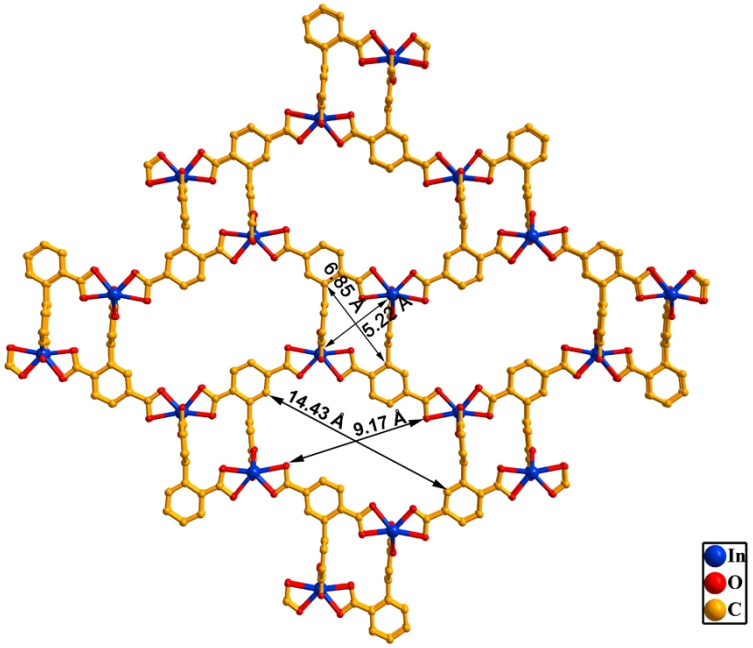

Fig. S1 The size of the channel for In^{III}-MOF.

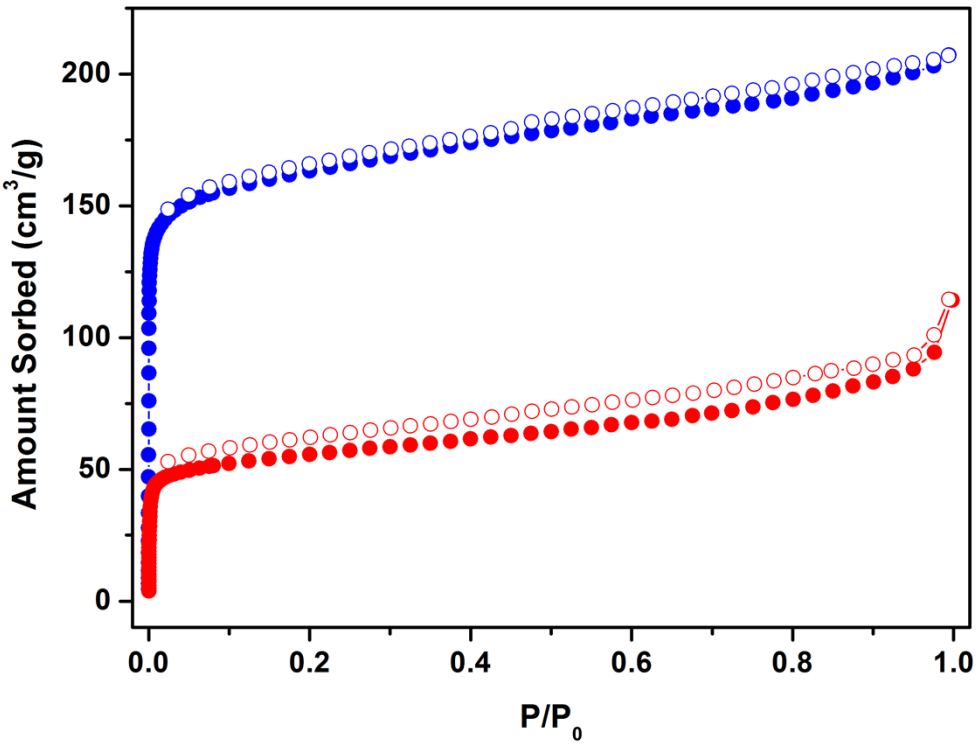

Fig. S2 Ar Adsorption-desorption isotherm for In^{III}-MOF (red) and In^{III}-MOF-Li^{+} (blue) at 87 K.

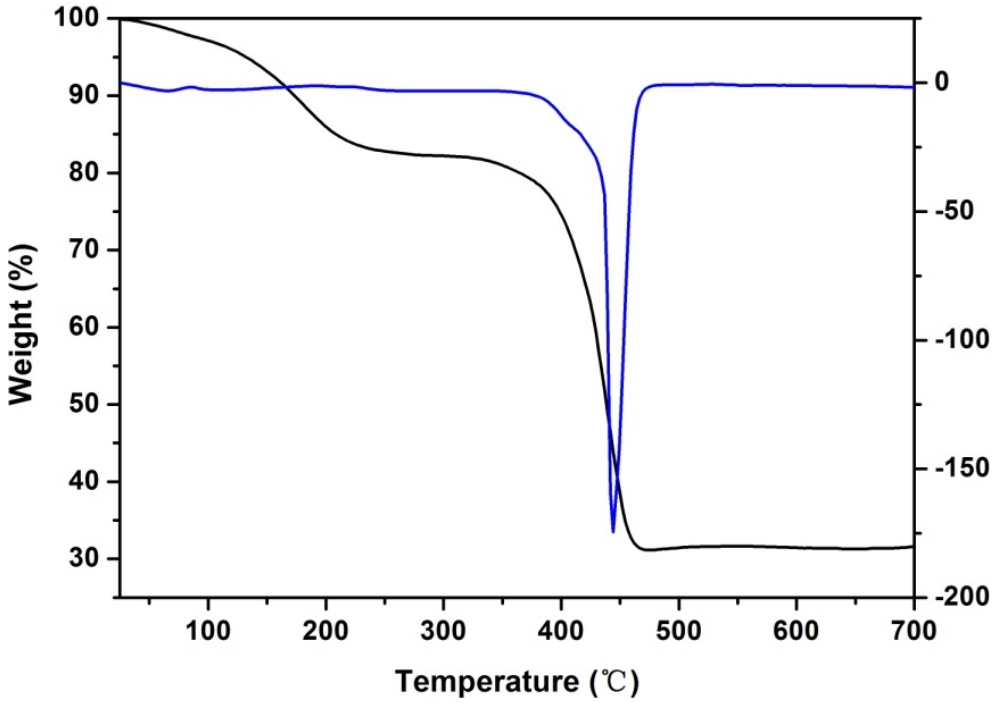

Fig. S3 The thermal stability of In^{III}-MOF was examined by thermogravimetric analysis (TGA) in the temperature range of 25–700 °C with a heating rate of 5 °C min^{-1} under a N_2 atmosphere.

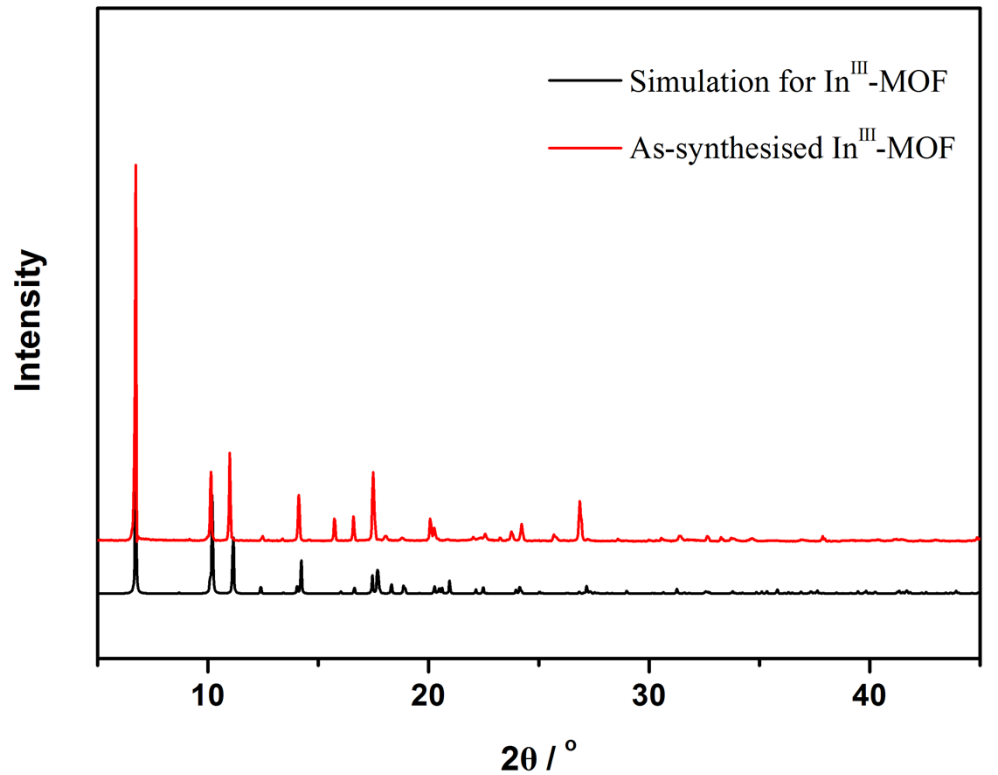

Fig. S4 Powder XRD patterns for simulated and as-synthesized In^{III}-MOF.

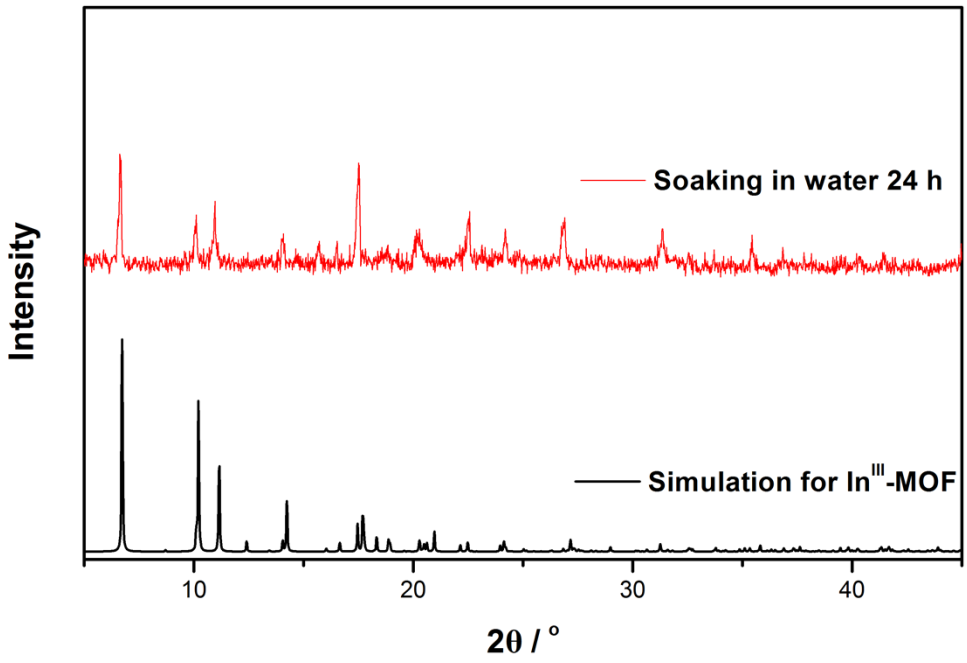

Fig. S5 Powder XRD patterns for simulated and as-synthesized In^{III}-MOF after soaking in water at room temperature.

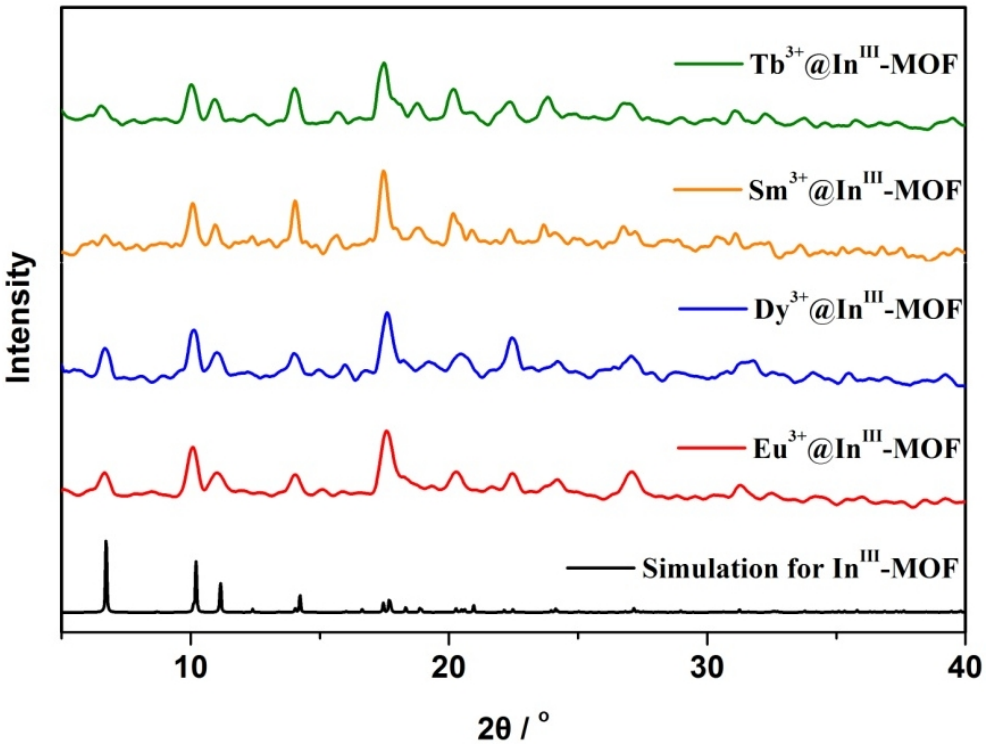

Fig. S6 Powder XRD patterns for simulated In^{III}-MOF and as-synthesized Ln^{3+}@ In^{III}-MOF (Ln^{3+} = Eu^{3+}, Dy^{3+} Sm^{3+}, and Tb^{3+}), respectively.

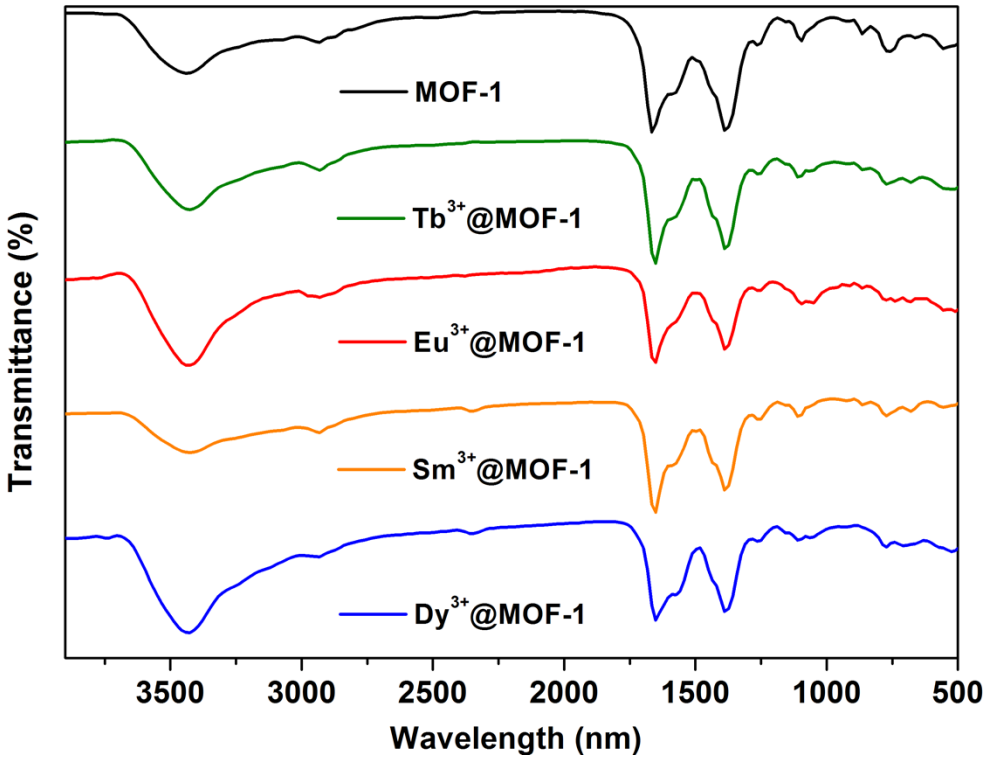

Fig. S7 IR spectra of the as-synthesized In^{III}-MOF, Tb^{3+}@In^{III}-MOF, Eu^{3+}@In^{III}-MOF, Sm^{3+}@In^{III}-MOF, and Dy^{3+}@In^{III}-MOF.

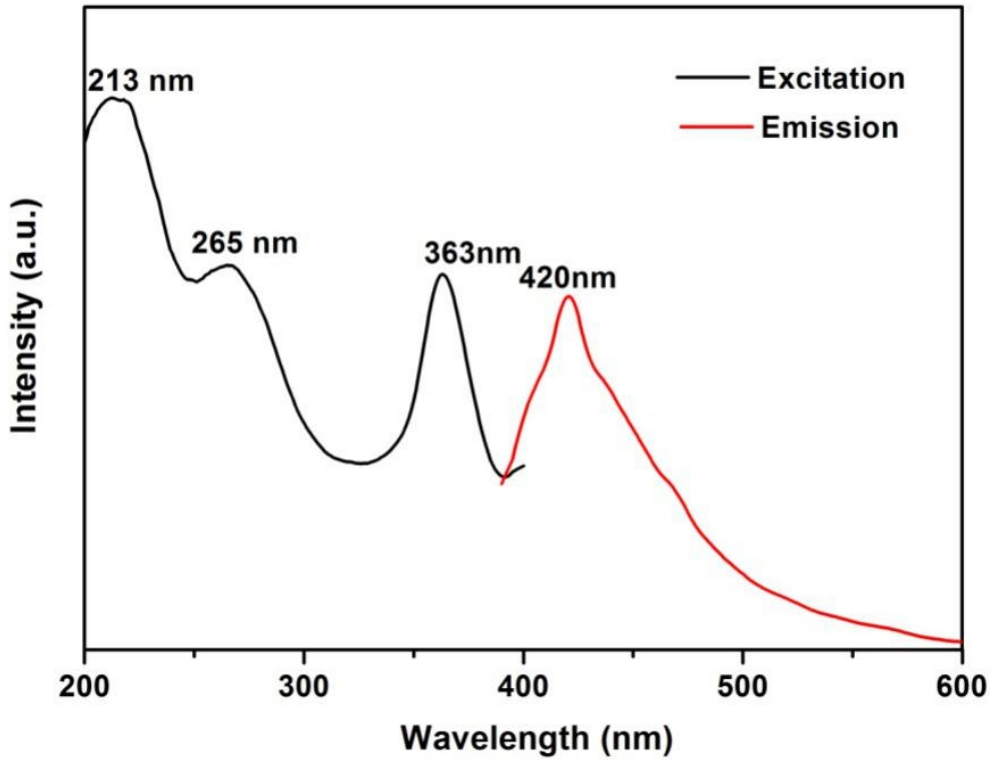

Fig. S8 Excitation and emission spectra of the H_4L ligand.

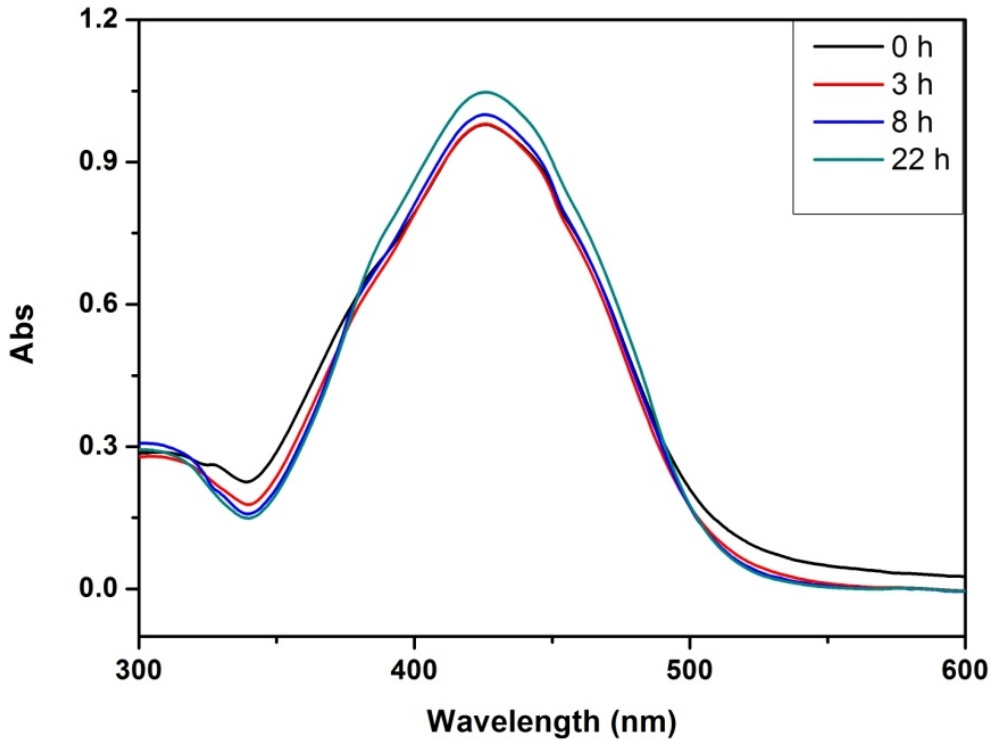

Fig. S9 UV-vis spectra of DMF solution of MO^- in the presence of In^{III}-MOF.

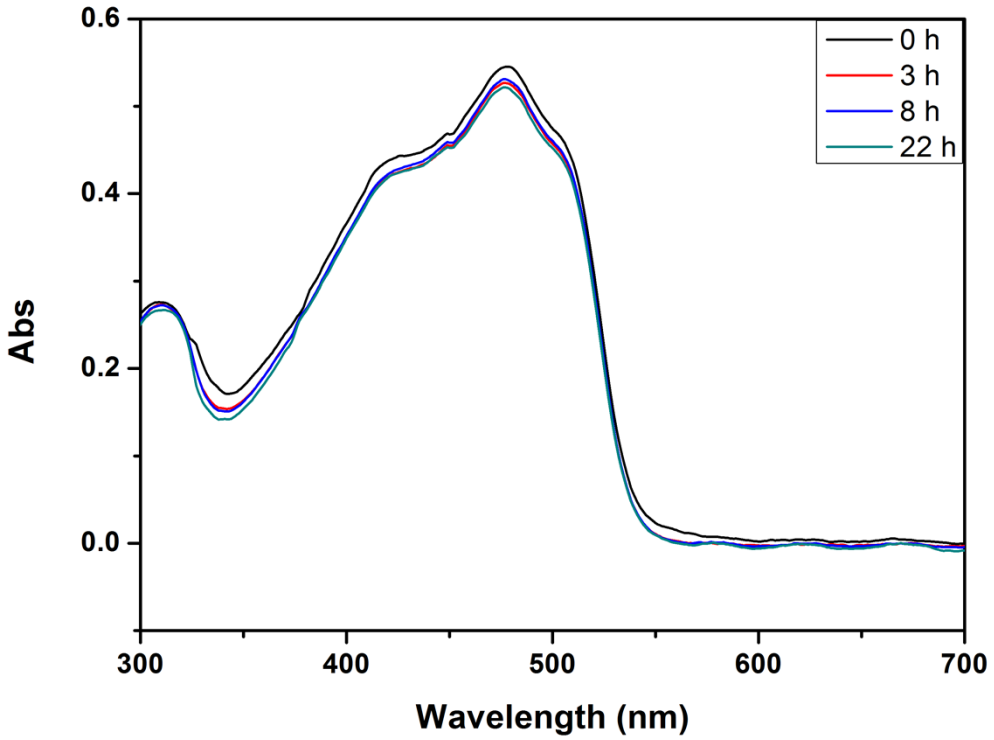

Fig. S10 UV-vis spectra of DMF solution of SD^0 in the presence of In^{III}-MOF.

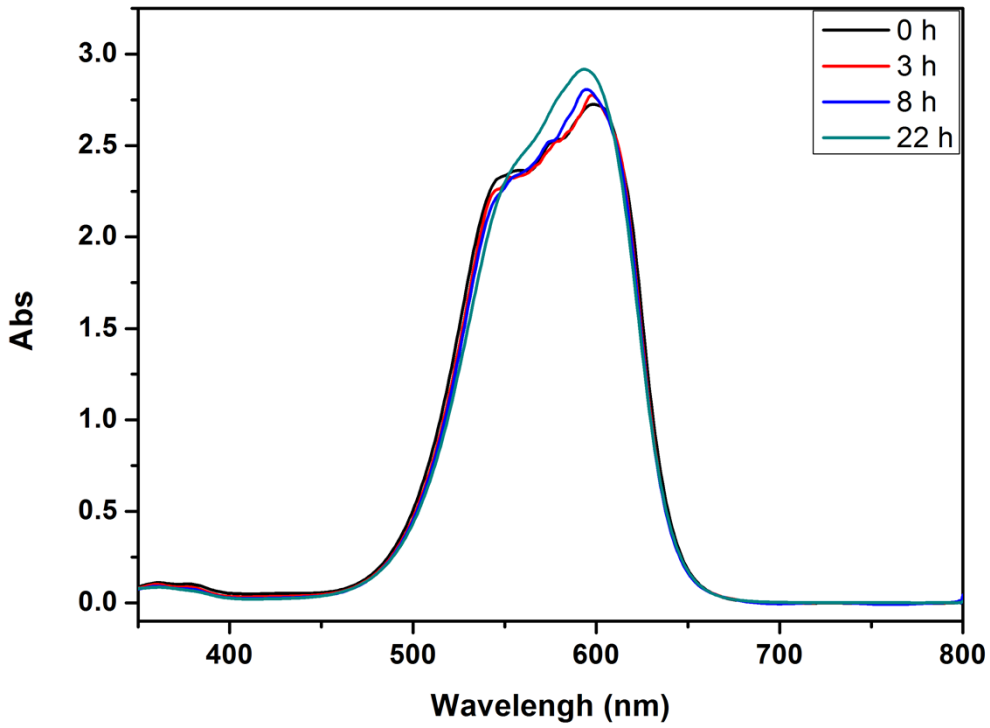

Fig. S11 UV-vis spectra of DMF solutions of CV^{+} in the presence of In^{III}-MOF.

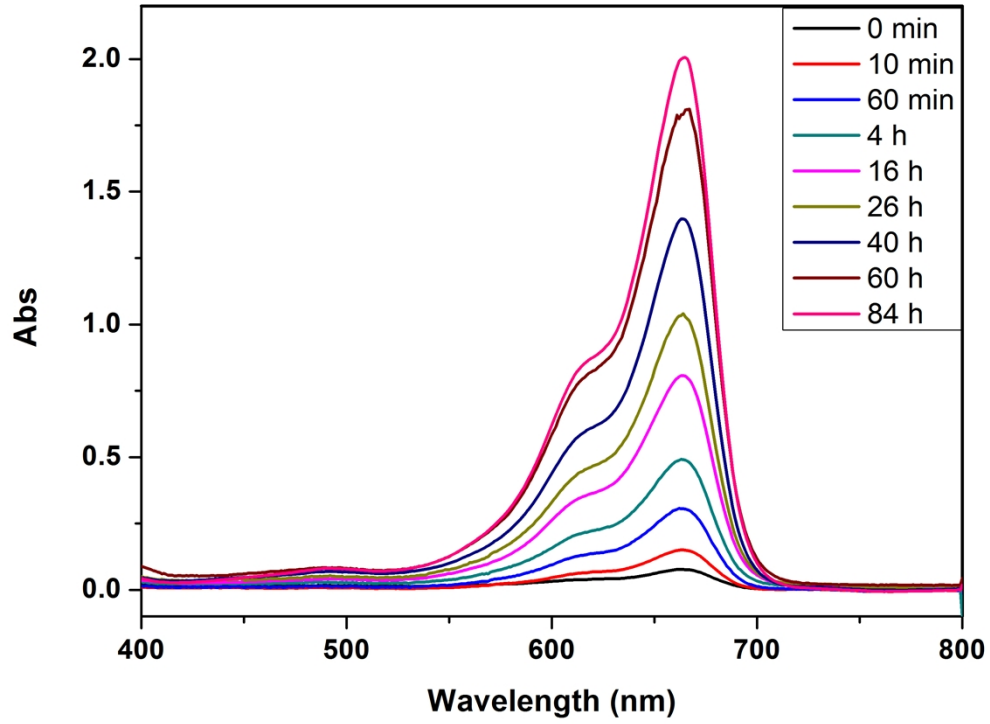

Fig. S12 UV-vis spectra of MB^{+} release from MB^{+}@In^{III}-MOF in the DMF solution.

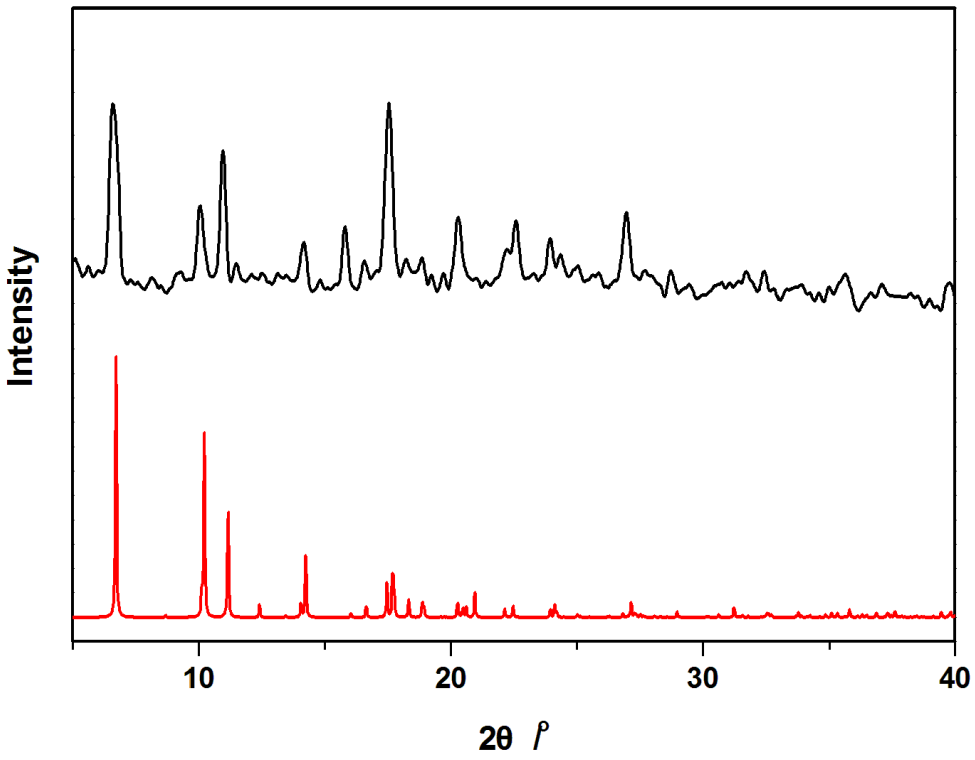

Fig. S13 Powder XRD patterns for simulated In^{III}-MOF and MB^{+}@In^{III}-MOF after MB^{+} release.

Table S1 Crystal data and structure refinement for **In^{III}-MOF**

Empirical formula	$C_{16}H_6InO_8$	
Formula weight	441.03	
Temperature	293(2) K	
Wavelength	0.71073 Å	
Crystal system	Orthorhombic	
Space group	*P*nma	
Unit cell dimensions	a = 20.305(5) Å	α= 90°
	b = 10.022(3) Å	β= 90°
	c = 17.220(5) Å	γ = 90°
Volume	3504.2(17) $Å^3$	
Z	4	
Density (calculated)	0.836 Mg/m^3	
Absorption coefficient	0.694 mm^{-1}	
F(000)	860	
Theta range for data collection	1.55 to 25.00°	
Index ranges	-21<=h<=23, -11<=k<=4, -18<=l<=20	
Reflections collected	12093	
Independent reflections	3132 [R(int) = 0.0663]	
Completeness to theta = 25.00°	95.6 %	
Absorption correction	Semi-empirical from equivalents	
Max. and min. transmission	0.8359 and 0.7843	
Refinement method	Full-matrix least-squares on F^2	
Data / restraints / parameters	3132 / 0 / 116	
Goodness-of-fit on F^2	0.976	
Final R indices [I>2sigma(I)]	R_1 = 0.0701, wR_2 = 0.1785	
R indices (all data)	R_1 = 0.0934, wR_2 = 0.1876	
Largest diff. peak and hole	1.569 and -2.694 e.$Å^{-3}$	

[a] $R_1 = \sum||F_o|-|F_c||/\sum|F_o|$; $wR_2 = \sum[w(F_o^2-F_c^2)^2]/\sum[w(F_o^2)^2]^{1/2}$

Table S2 The ICP data for Ln^{3+} and In^{3+} ions in Ln^{3+}@In^{III}-MOF

	Elemental Concentration (ppm)		The molar ratio of In^{3+}:Ln^{3+}	
	In^{3+}	Ln^{3+}		
Tb^{3+}@In^{III}-MOF	12.4413	4.18459	2.97	1
Eu^{3+}@In^{III}-MOF	12.4261	4.04375	3.07	1
Sm^{3+}@In^{III}-MOF	12.6481	3.98411	3.17	1
Dy^{3+}@In^{III}-MOF	12.5492	3.87249	3.24	1