Electronic Supporting Information

A multifuctional Cd(II)-based metal−organic framework with amide groups exhibiting luminescent sensing towards multiple substances

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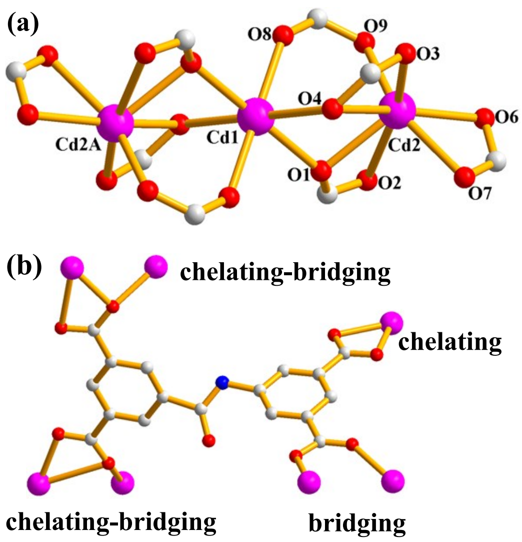

Fig. S1 (a) The coordination environment of Cd(II) atoms in **1**; symmetry code: A 1-x, -y, -z; B -1+x, y, z; C x, 1+y, -1+z; D x, y, -1+z. (b) The three coordination modes of H_4L in **1.**

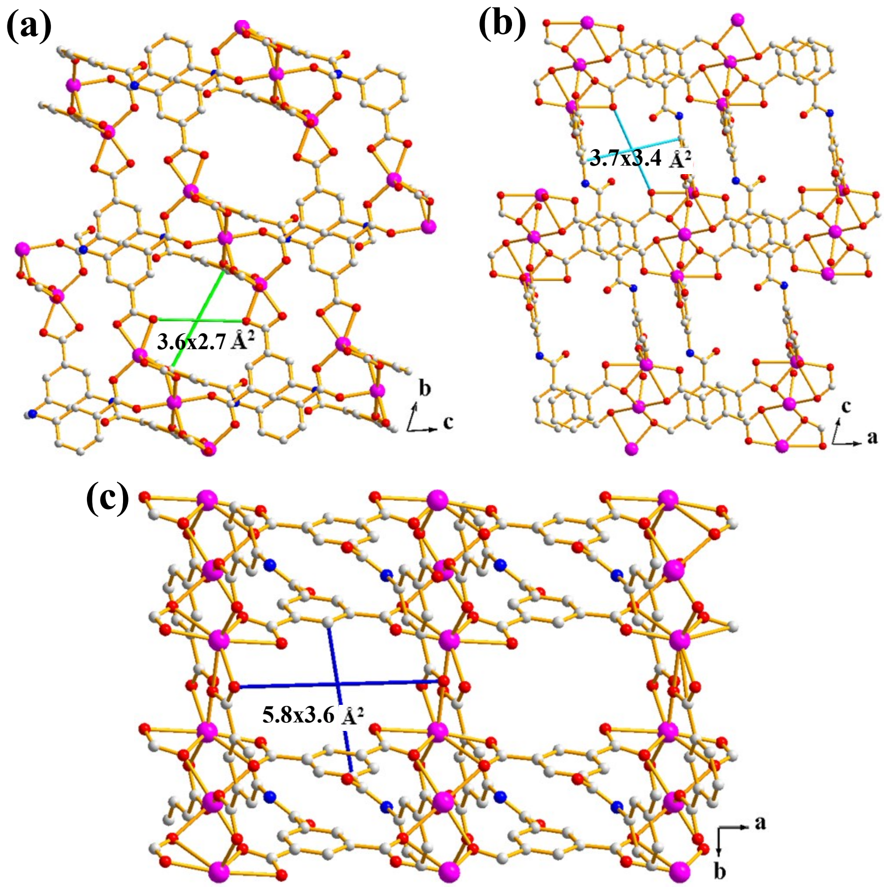

Fig. S2 Ball-and-stick representation of 3D framework of **1** showing channels along the *a* (a), *b* (b) and *c* (c) direction, respectively.

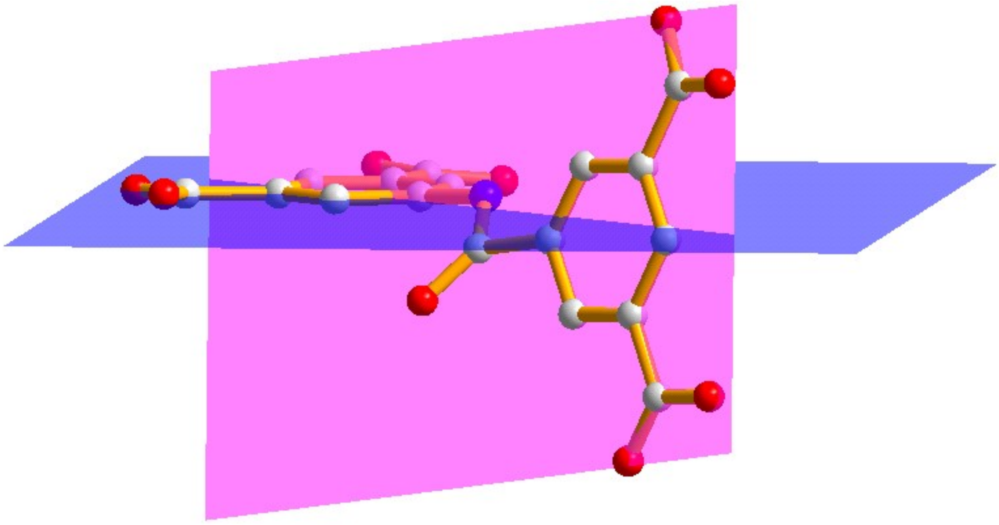

Fig. S3 Conformation of L^{4-} linker in **1** in which the two terminal isophthalic moieties are not coplanar with a dihedral angle of about 80.2°.

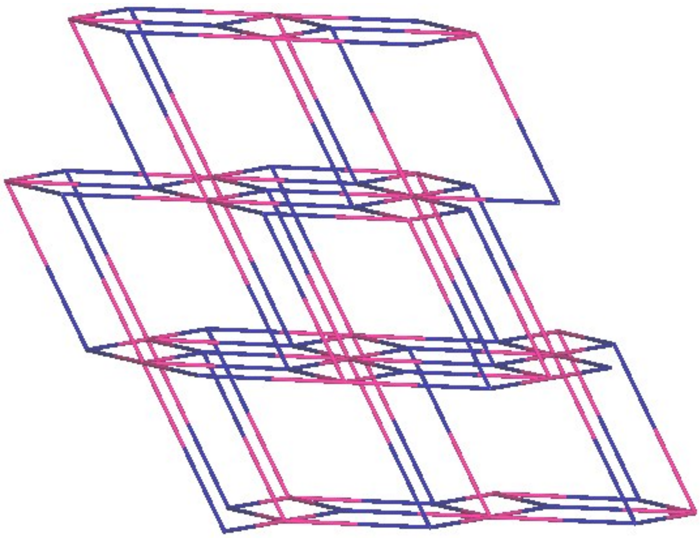

Fig. S4 The 4,8-connected ***flu*** network in **1** shown as a stick diagram.

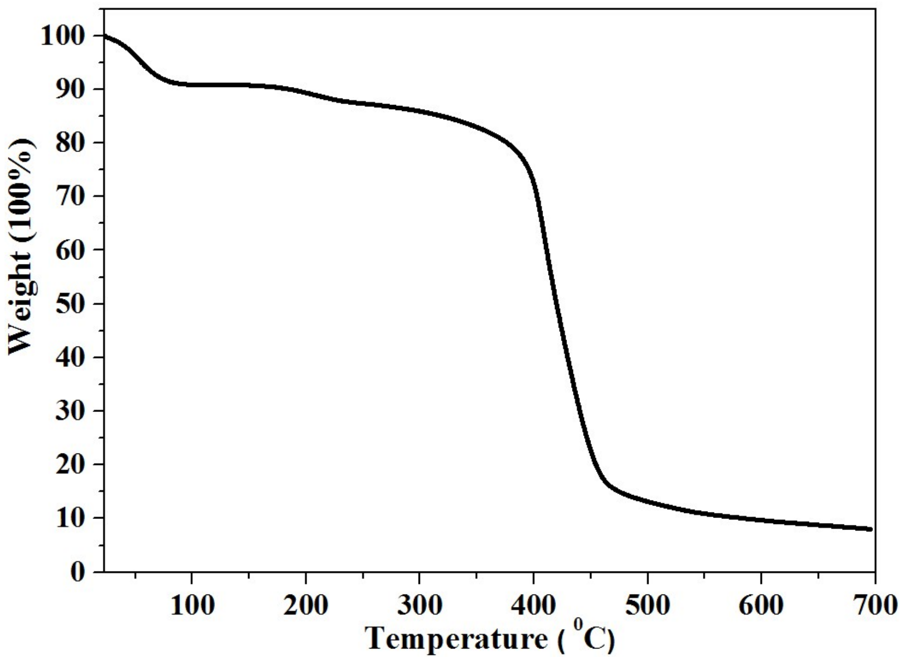

Fig. S5 TGA data of **1**.

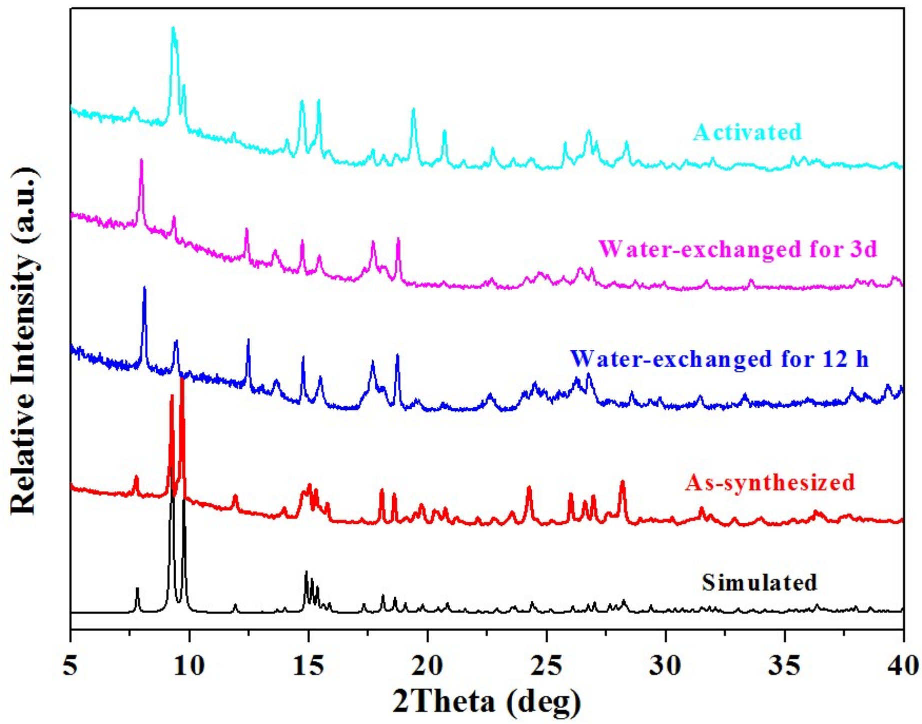

Fig. S6 PXRD patterns for **1**: a simulated PXRD pattern from the single-crystal structure, as-synthesized, water-exchanged and activated samples, respectively.

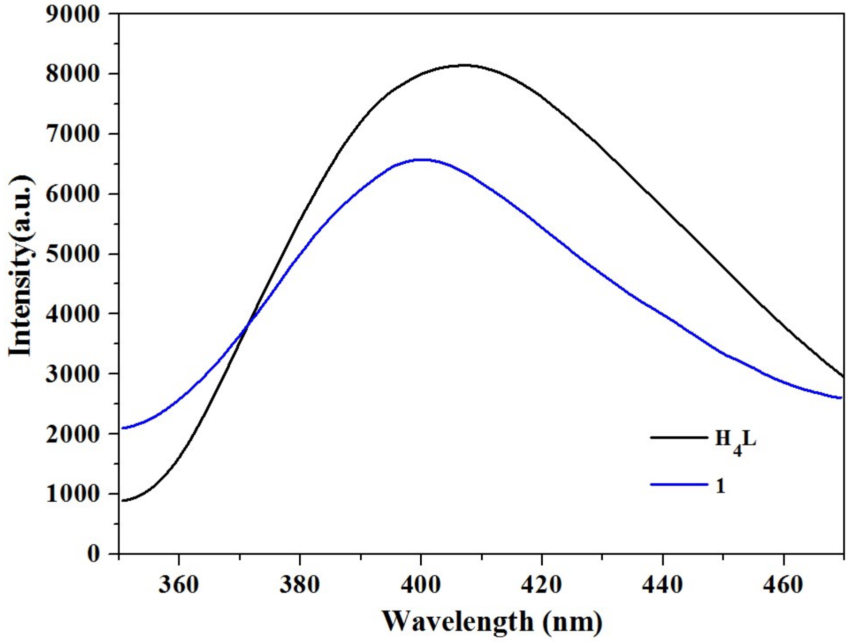

Fig. S7 Solid-state luminescence spectra of H_4L and **1** at room temperature.

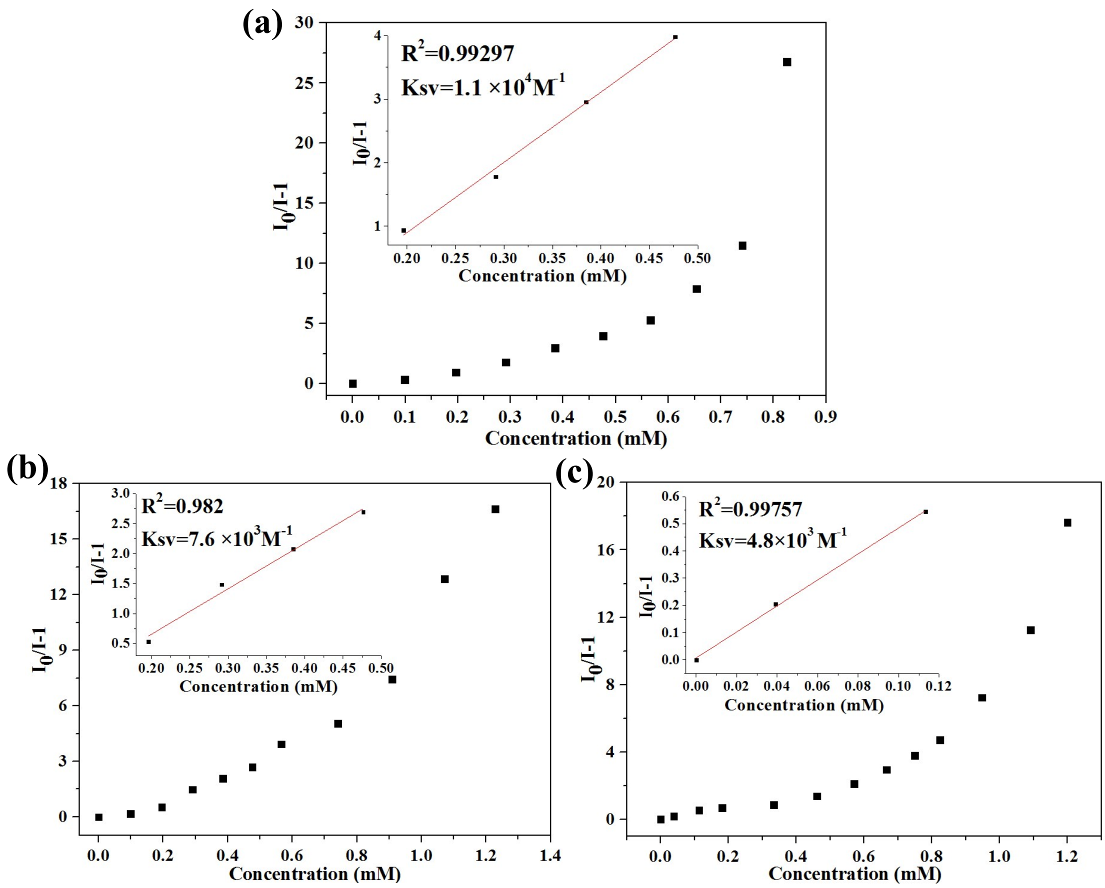

Fig. S8 The Stern-Volmer plots for **1** with Fe^{3+} (a), Cu^{2+} (b) and $Cr_2O_7^{2-}$ (c).

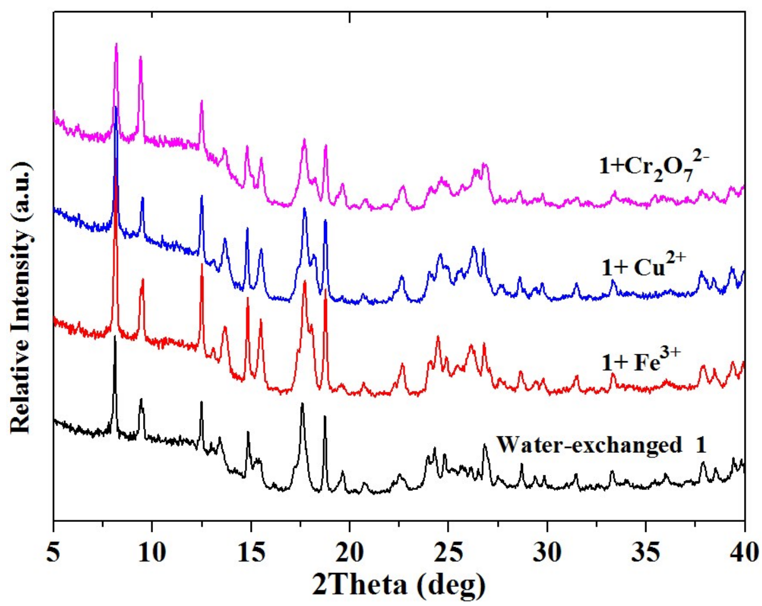

Fig. S9 Experimental XRD patterns of **1** before and after treated with aqueous solution of different ions.

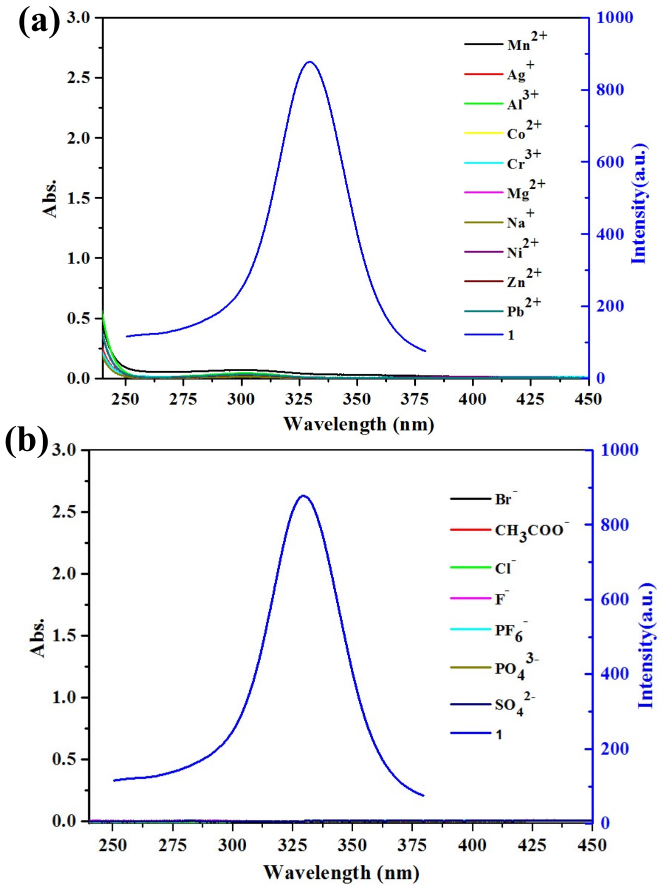

Fig. S10 View for the UV-vis adsorption spectra of some metal ions (a) and anions (b) in water and exaction spectrum for **1**.

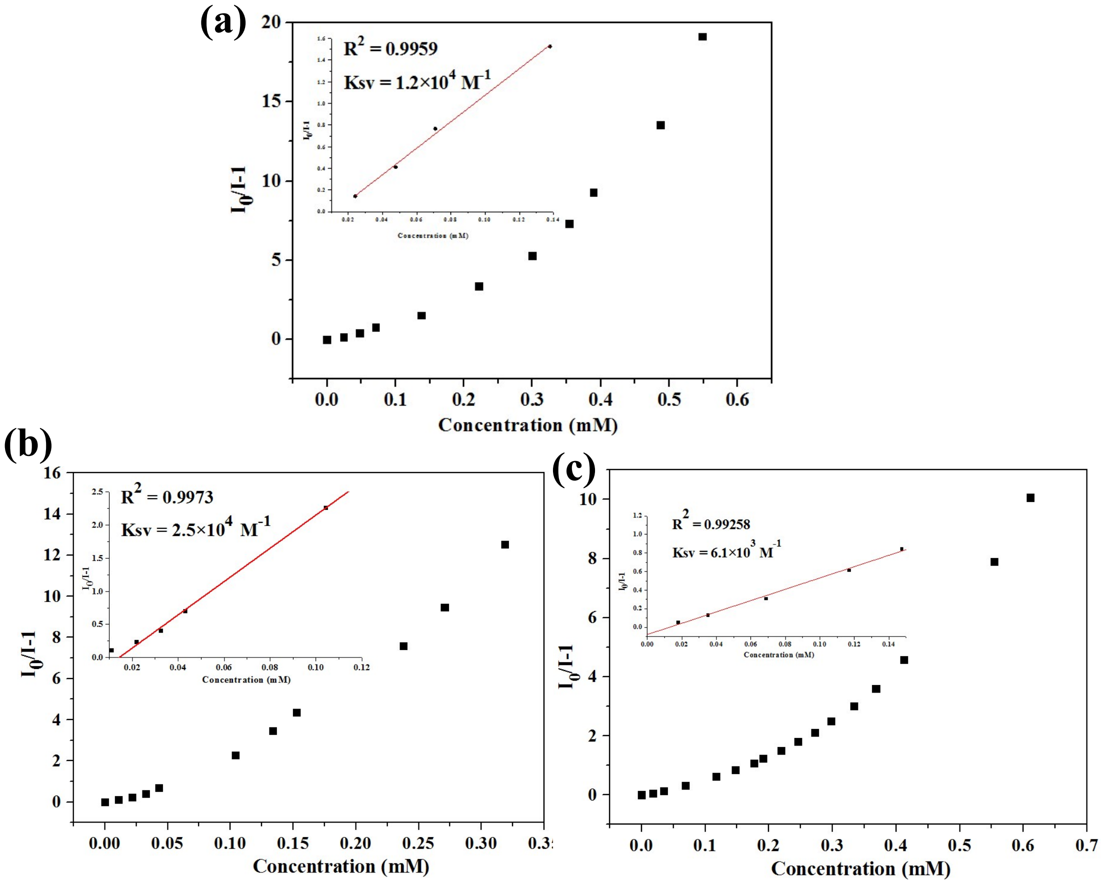

Fig. S11 The Stern-Volmer plots for **1** with NB (a), 4-NT (b) and 1,3-DNB (c).

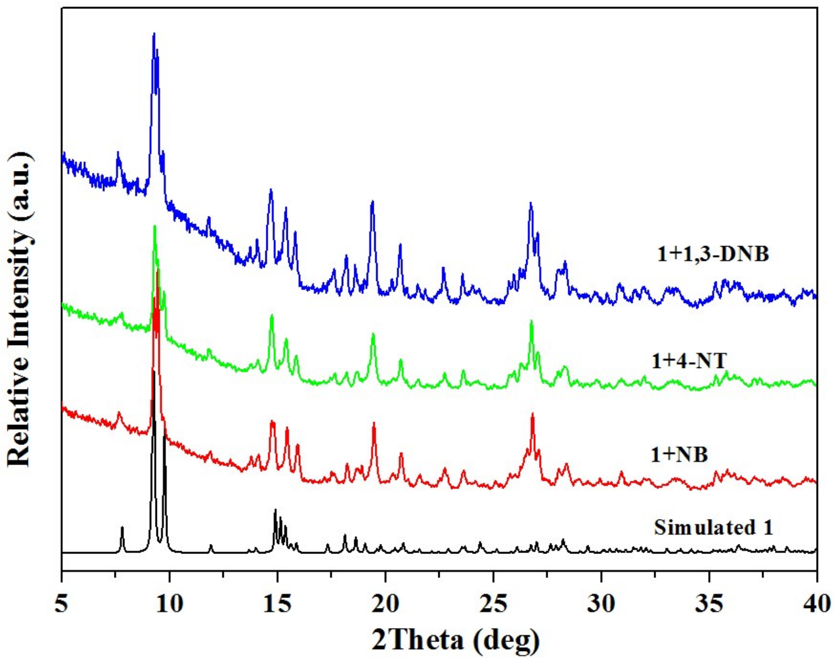

Fig. S12 Simulated and experimental XRD patterns of **1** after treated with different nitroaromatics.

Table S1 Summary of some MOF-based sensors for detecting $Fe^{3+}$and Cu^{2+} ions

MOFs	**analyte**	K_{SV} **(M^{-1})**	**solvent**	**reference**
$\{[(CH_3)_2NH_2]_4[Ca_2Zn_4(L)_4]\cdot 4DMF\}_n$	Fe^{3+}	4.36×10^3	H_2O	1
$[Eu(IMS1)_2]Cl\cdot 4H_2O$	Fe^{3+}	5.87×10^3	H_2O	2
Zn-TCPP	Fe^{3+}	1.08×10^4	EtOH	3
$\{[Cd_2(L)_2(bpe)_2]\cdot 3DMF\cdot 2.5H_2O\}n$	Fe^{3+}	1.7×104	DMF	4
$[Tb_4(L)_6(H_2O)_8]$	Fe^{3+}	1.88×10^4	H_2O	5
Eu-MOF	Fe^{3+}	2.09×10^4	H_2O	6
$\{[Cd(L)(BPDC)]\cdot 2H_2O\}n$	Fe^{3+}	3.63×10^4	H_2O	7
$\{[Cd(L)(SDBA)(H_2O)]\cdot 0.5H_2O\}n$	Fe^{3+}	3.59×10^4	H_2O	7
$([Zn_2Na_2(TPHC)(4,4\text{-}Bipy)(DMF)]\cdot 8H_2O)$ (JLU-MOF71)	Fe^{3+}	5.77×10^4	DMF	8
CPP-16	Cu^{2+}	7.85×10^3	MeCN	9
$Zr_6O_4(OH)_4(TCPPH_2)_3$ (MOF-525)	Cu^{2+}	4.5×10^5	DMF	10
Eu@3	Cu^{2+}	501.2	DMF	11
$Eu_2(FMA)_2(OX)(H_2O)_4\cdot 4H_2O$	Cu^{2+}	528.7	H_2O	12
$(Me_2NH_2)_2[Cd_3(L)_2]\cdot 7H_2O$ (1)	Fe^{3+}	1.1×10^4	H_2O	This work
	Cu^{2+}	7.6×10^3	H_2O	This work

Table S2 Summary of some MOF-based sensors for detecting $Cr_2O_7^{2-}$ ions

MOFs	**analyte**	**K_{SV} (M^{-1})**	**solvent**	**reference**
$\{[(CH_3)_2NH_2]_4[Ca2Zn_4(L)_4]\cdot 4DMF\}_n$	$Cr_2O_7^{2-}$	1.15×10^3	H_2O	1
[Cd3(cpota)2(phen)3]n·5nH2O	$Cr_2O_7^{2-}$	1.21×10^3	H_2O	13
[Zn(IPA)(3-PN)]n	$Cr_2O_7^{2-}$	1.37×10^3	H_2O	14
[Cd(IPA)(3-PN)]n	$Cr_2O_7^{2-}$	2.91×10^3	H_2O	14
[Zn(btz)]n	$Cr_2O_7^{2-}$	3.19×10^3	H_2O	15
$\{[Zn_2(ttz)H_2O]n\}$	$Cr_2O_7^{2-}$	2.19×10^3	H_2O	14
$\{[Cd_2(L)2(bpe)_2]\cdot 3DMF\cdot 2.5H_2O\}$ n	$Cr_2O_7^{2-}$	3.7×10^3	DMF	4
$[Tb_4(L)_6(H_2O)_8]$	$Cr_2O_7^{2-}$	4.1×10^3	H_2O	5
$\{[Cd(L)(BPDC)]\cdot 2H_2O\}$n	$Cr_2O_7^{2-}$	6.4×10^3	H_2O	7
$\{[Cd(L)(SDBA)(H_2O)]\cdot 0.5H_2O\}$n	$Cr_2O_7^{2-}$	4.97×10^3	H_2O	7
$\{[Zn_2(TPOM)(NH_2\text{-}BDC)_2]\cdot 4H_2O\}$n	$Cr_2O_7^{2-}$	7.59×10^3	DMF	16
NU-1000	$Cr_2O_7^{2-}$	1.34×10^4	H_2O	17
$(Me_2NH_2)_2[Cd_3(L)_2]\cdot 7H_2O$ (1)	$Cr_2O_7^{2-}$	4.8×10^3	H_2O	This work

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