Supporting Information for

Two luminescent lanthanide-organic frameworks containing bithiophene groups for the selective detection of nitrobenzene and Fe^{3+}

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Table S1

Selected bond lengths(Å) and angles(^{o}) for **1**.

Eu(1)-O(1)	2.357(3)	Eu(1)-O(2)#1	2.364(3)
Eu(1)-O(5)	2.381(3)	Eu(1)-O(6)#1	2.340(3)
Eu(1)-O(9)	2.503(3)	Eu(1)-O(10)	2.430(3)
Eu(1)-O(13)	2.453(3)	Eu(1)-O(16)	2.392(3)
Eu(2)-O(3)#2	2.353(3)	Eu(2)-O(4)#5	2.391(3)
Eu(2)-O(7)#3	2.362(2)	Eu(2)-O(8)#4	2.364(3)
Eu(2)-O(11)	2.478(3)	Eu(2)-O(12)	2.456(3)
Eu(2)-O(14)	2.427(3)	Eu(2)-O(15)	2.422(3)
O(1)-Eu(1)-O(2)#1	123.46(10)	O(1)-Eu(1)-O(5)	80.17(10)
O(1)-Eu(1)-O(9)	135.21(9)	O(1)-Eu(1)-O(10)	91.96(10)
O(1)-Eu(1)-O(13)	143.18(11)	O(1)-Eu(1)-O(16)	74.03(12)
O(2)#1-Eu(1)-O(5)	75.07(10)	O(2)#1-Eu(1)-O(9)	79.74(10)
O(2)#1-Eu(1)-O(10)	132.29(10)	O(2)#1-Eu(1)-O(13)	77.22(11)
O(2)#1-Eu(1)-O(16)	141.79(10)	O(5)-Eu(1)-O(9)	144.45(9)
O(5)-Eu(1)-O(10)	148.47 (10)	O(5)-Eu(1)-O(13)	76.63(11)
O(5)-Eu(1)-O(16)	75.48(10)	O(6)#1-Eu(1)-O(1)	73.37(10)
O(6)#1-Eu(1)-O(2)#1	78.85(9)	O(6)#1-Eu(1)-O(5)	122.69(10)
O(6)#1-Eu(1)-O(9)	75.26(10)	O(6)#1-Eu(1)-O(10)	83.03(10)
O(6)#1-Eu(1)-O(13)	143.46(11)	O(6)#1-Eu(1)-O(16)	138.41(10)
O(10)-Eu(1)-O(9)	52.96(9)	O(10)-Eu(1)-O(13)	93.10(11)
O(13)-Eu(1)-O(9)	73.61(11)	O(16)-Eu(1)-O(9)	112.81(12)
O(16)-Eu(1)-O(10)	73.00(11)	O(16)-Eu(1)-O(13)	72.71(12)
O(3)#2-Eu(2)-O(4)#5	123.30(10)	O(3)#2-Eu(2)-O(7)#3	78.95(9)
O(3)#2-Eu(2)-O(8)#4	76.96(10)	O(3)#2-Eu(2)-O(11)	128.89(10)
O(3)#2-Eu(2)-O(12)	77.84(10)	O(3)#2-Eu(2)-O(14)	78.81(9)
O(3)#2-Eu(2)-O(15)	143.82(9)	O(4)#5-Eu(2)-O(11)	92.12(9)
O(4)#5-Eu(2)-O(12)	139.42(9)	O(4)#5-Eu(2)-O(14)	139.23(9)
O(4)#5-Eu(2)-O(15)	73.44(9)	O(7)#3-Eu(2)-O(4)#5	73.84(9)
O(7)#3-Eu(2)-O(8)#4	122.24(10)	O(7)#3-Eu(2)-O(11)	77.46(9)
O(7)#3-Eu(2)-O(12)	77.94	O(7)#3-Eu(2)-O(14)	146.91(10)
O(7)#3-Eu(2)-O(15)	136.61(9)	O(8)#4-Eu(2)-O(4)#5	77.25(9)
O(8)#4-Eu(2)-O(11)	152.41(9)	O(8)#4-Eu(2)-O(12)	143.25(9)
O(8)#4-Eu(2)-O(14)	75.54(10)	O(8)#4-Eu(2)-O(15)	76.50(10)
O(12)-Eu(2)-O(11)	53.21(9)	O(14)-Eu(2)-O(11)	98.19(10)
O(14)-Eu(2)-O(12)	73.65(10)	O(15)-Eu(2)-O(11)	76.07(10)
O(15)-Eu(2)-O(12)	111.14(10)	O(15)-Eu(2)-O(14)	71.07(10)

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

Table S2

Selected bond lengths(Å) and angles(°) for **2**.

Tb(1)-O(1)	2.457(3)	Tb(1)-O(1A)	2.403(3)
Tb(1)-O(1B)	2.419(3)	Tb(1)-O(2)	2.432(3)
Tb(1)-O(5)	2.337(3)	Tb(1)-O(6)#3	2.356(3)
Tb(1)-O(11)#1	2.339(3)	Tb(1)-O(12)#2	2.345(3)
Tb(2)-O(1C)	2.427(3)	Tb(2)-O(1D)	2.41(2)
Tb(2)-O(1D')	2.377(11)	Tb(2)-O(3)#5	2.467(3)
Tb(2)-O(4)#5	2.433(3)	Tb(2)-O(7)#4	2.330(3)
Tb(2)-O(8)	2.340(3)	Tb(2)-O(9)	2.360(3)
Tb(2)-O(10)#4	2.315(3)		
O(1A)-Tb(1)-O(1)	75.30(11)	O(1A)-Tb(1)-O(1B)	71.19(13)
O(1A)-Tb(1)-O(2)	110.80(12)	O(1B)-Tb(1)-O(1)	98.56(12)
O(1B)-Tb(1)-O(2)	73.84(12)	O(2)-Tb(1)-O(1)	53.63(11)
O(5)-Tb(1)-O(1)	129.50(10)	O(5)-Tb(1)-O(1A)	143.87(12)
O(5)-Tb(1)-O(1B)	78.49(12)	O(5)-Tb(1)-O(2)	77.96(11)
O(5)-Tb(1)-O(6)#3	123.22(11)	O(5)-Tb(1)-O(11)	79.31(11)
O(5)-Tb(1)-O(12)#2	76.90(11)	O(6)#3-Tb(1)-O(1)	91.65(11)
O(6)#3-Tb(1)-O(1A)	73.82(12)	O(6)#3-Tb(1)-O(1B)	139.50(11)
O(6)#3-Tb(1)-O(2)	139.15(11)	O(11)#1-Tb(1)-O(1)	77.39(11)
O(11)#1-Tb(1)-O(1A)	136.28(12)	O(11)#1-Tb(1)-O(1B)	146.94(12)
O(11)#1-Tb(1)-O(2)	77.78(12)	O(11)#1-Tb(1)-O(6)#3	73.54(11)
O(11)#1-Tb(1) O(12)#2	122.43(11)	O(12)#2-Tb(1)-O(1)	151.92(11)
O(12)#2-Tb(1)-O(1A)	76.83(12)	O(12)#2-Tb(1)-O(1B)	75.41(12)
O(12)#2-Tb(1)-O(2)	143.42(12)	O(12)#2-Tb(1)- O(6)#3	77.35(11)
O(1C)-Tb(2)-O(3)#5	74.39(13)	O(1C)-Tb(2)-O(4)#5	94.35(13)
O(1D)-Tb(2)-O(1C)	72.4(9)	O(1D)-Tb(2)-O(3)#5	117.8(6)
O(1D)-Tb(2)-O(4)#5	78.6(6)	O(1D')-Tb(2)-O(1C)	71.1(6)
O(1D')-Tb(2)-O(1D)	9.0(8)	O(1D')-Tb(2)-O(3)#5	109.3(4)
O(1D')-Tb(2)-O(4)#5	70.1(4)	O(4)#5-Tb(2)-O(3)#5	53.40(11)
O(7)#4-Tb(2)-O(1C)	142.15(13)	O(7)#4-Tb(2)-O(1D)	72.0(8)
O(7)#4-Tb(2)-O(1D')	75.6(6)	O(7)#4-Tb(2)-O(3)#5	135.08(11)
O(7)#4-Tb(2)-O(4)#5	90.81(12)	O(7)#4-Tb(2)-O(8)	123.92(12)
O(7)#4-Tb(2)-O(9)	80.21(12)	O(8)-Tb(2)-O(1C)	78.07(13)
O(8)-Tb(2)-O(1D)	139.2(8)	O(8)-Tb(2)-O(1D')	143.9(5)
O(8)-Tb(2)-O(3)#5	79.11(11)	O(8)-Tb(2)-O(4)#5	131.86(11)
O(8)-Tb(2)-O(9)	75.46(11)	O(9)-Tb(2)-O(1C)	76.43(12)
O(9)-Tb(2)-O(1D)	70.8(6)	O(9)-Tb(2)-O(1D')	79.3(4)
O(9)-Tb(2)-O(3)#5	144.51(12)	O(9)-Tb(2)-O(4)#5	149.37(12)
O(10)#4-Tb(2)-O(1C)	144.42(13)	O(10)#4-Tb(2)-O(1D)	139.5(9)
O(10)#4-Tb(2)-O(1D')	137.2(6)	O(10)#4-Tb(2)-O(3)#5	74.96(13)
O(10)#4-Tb(2)-O(4)#5	81.50(12)	O(10)#4-Tb(2)-O(7)#4	73.41(12)
O(10)#4-Tb(2)-O(8)	78.79(12)	O(10)#4-Tb(2)-O(9)	122.70(12)

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

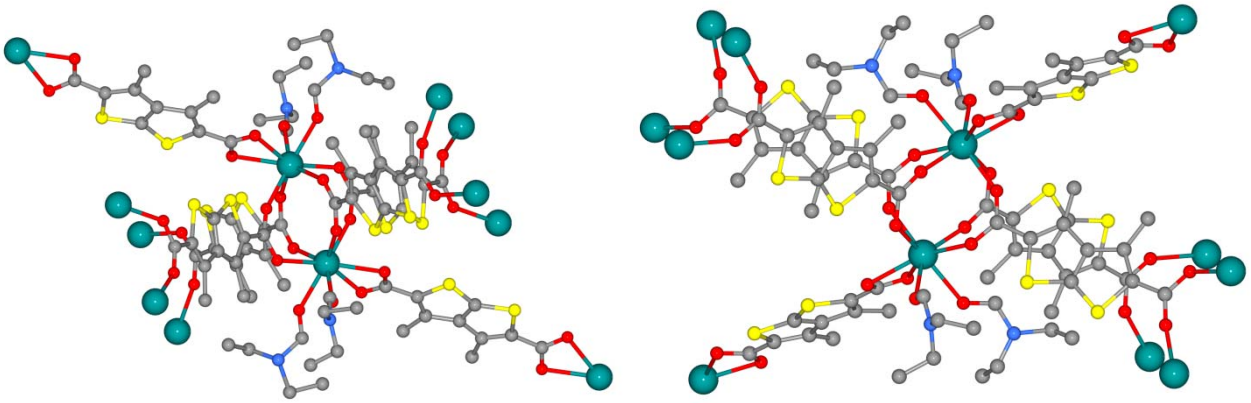

Fig. S1 The paddle-wheel secondary building units (SBUs) constructed by dicarboxylic linkers and Eu ions.

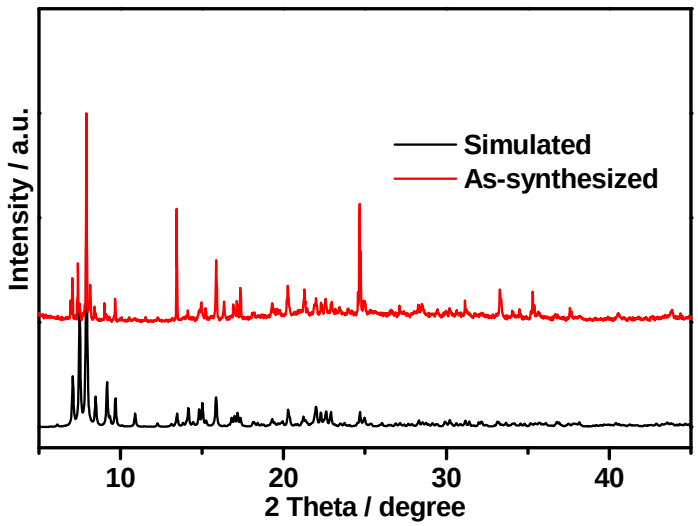

Fig.S2 PXRD of **1**.

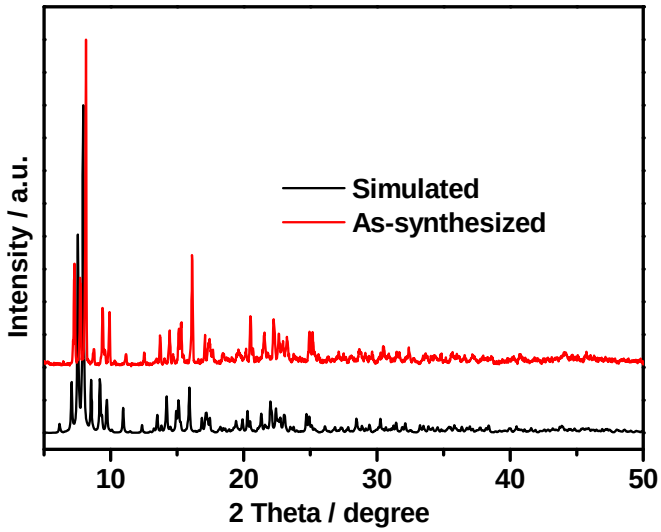

Fig.S3 PXRD of **2**.

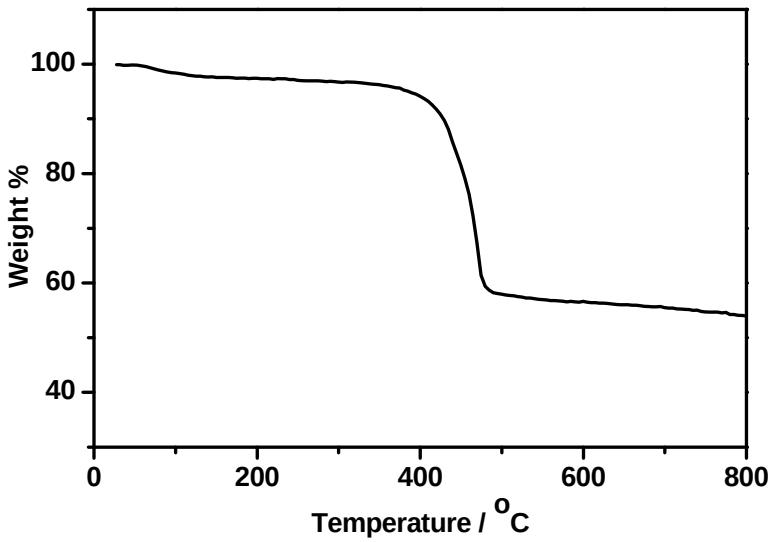

Fig.S4 TG curve of **1a** in N_2 environment.

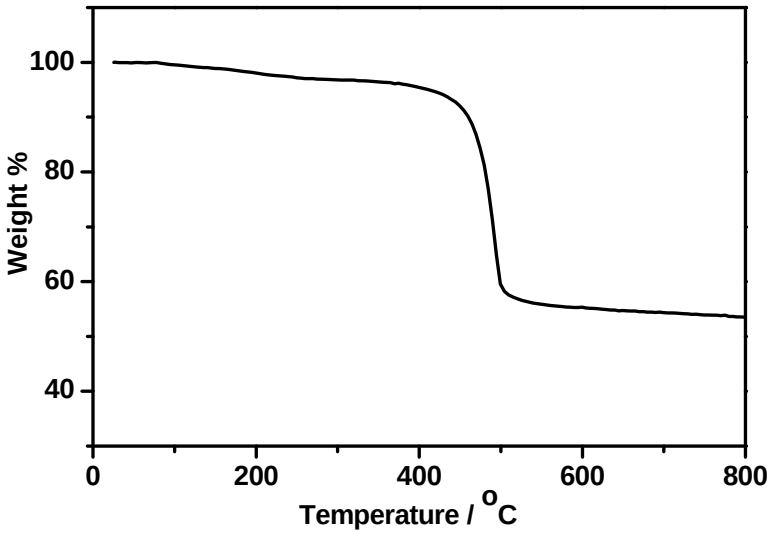

Fig.S5 TG curve of **2a** in N_2 environment.

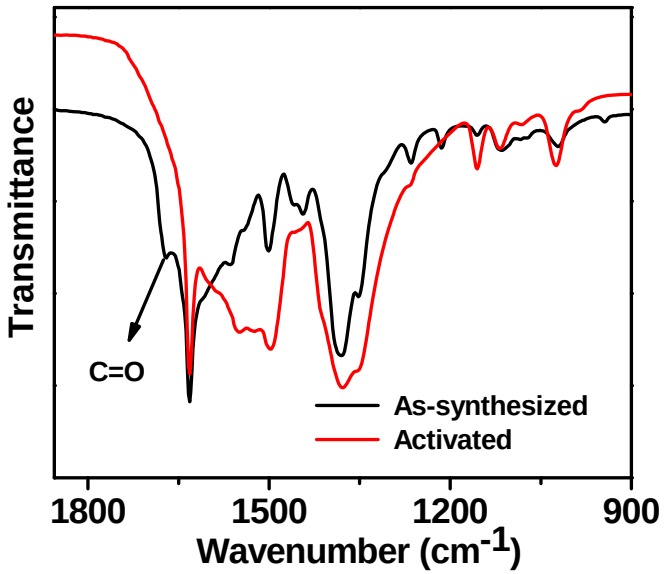

Fig. S6 IR spectra of the as-synthesis and activated sample. The lack of C=O stretching peak at 1670 cm^{-1} in the IR spectrum of activated **1** also confirms the full release of DEF guests.

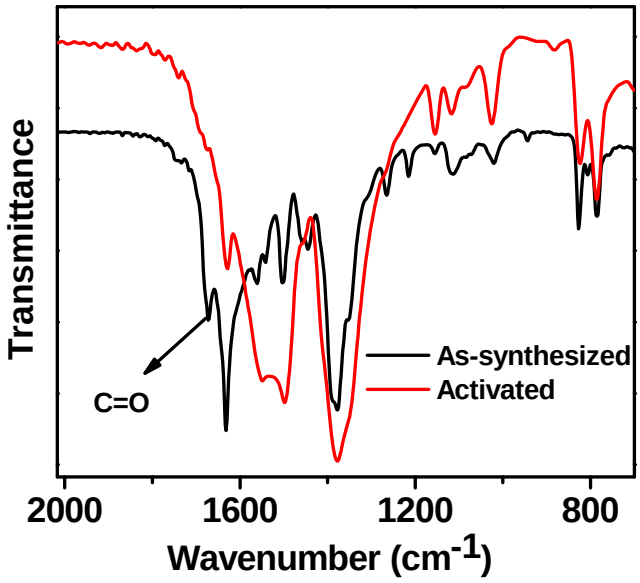

Fig. S7 IR spectra of the as-synthesis and activated sample. The lack of C=O stretching peak at 1671 cm^{-1} in the IR spectrum of activated **2** also confirms the full release of DEF guests.

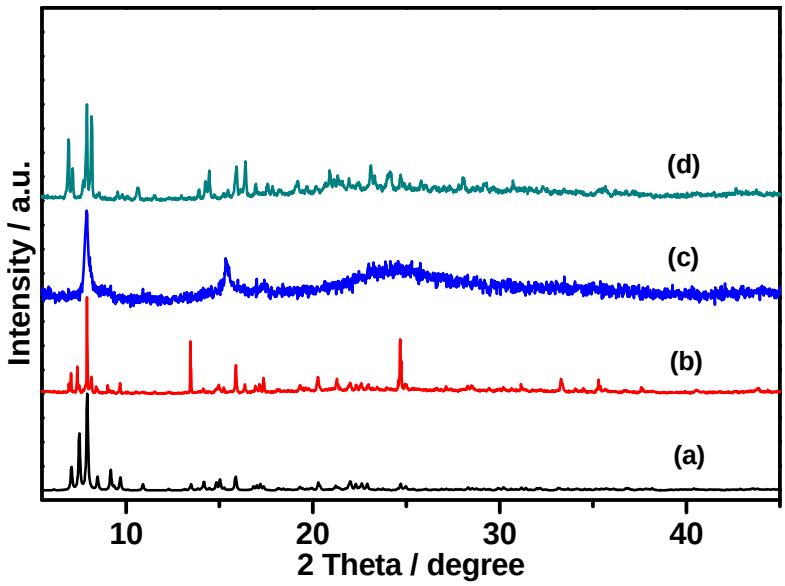

Fig. S8 XRD of **1** in different conditions. (a) Simulated patterns by single-crystal X-ray diffraction; (b) As-synthesized patterns; (c) activated by methanol and dichloromethane exchange and then heating at 140 ^{o}C under vacuum for 4 hrs; (d) regenerated by soaking in DMF after activation.

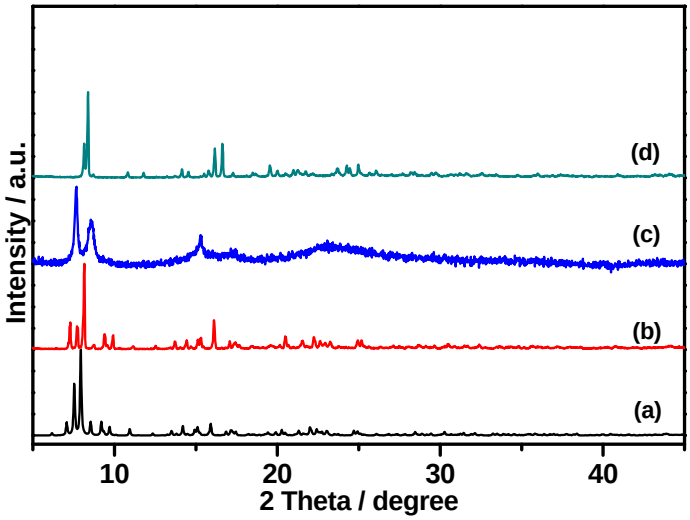

Fig. S9 XRD of **2** in different conditions. (a) Simulated patterns by single-crystal X-ray diffraction; (b) As-synthesized patterns; (c) activated by methanol and dichloromethane exchange and then heating at 140 ^{o}C under vacuum for 4 hrs; (d) regenerated by soaking in DMF after activation.

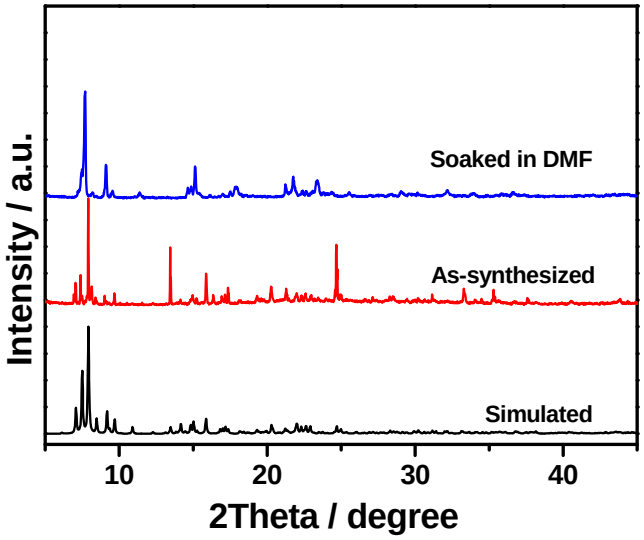

Fig. S10 XRD of **1** soaked in DMF solvent.

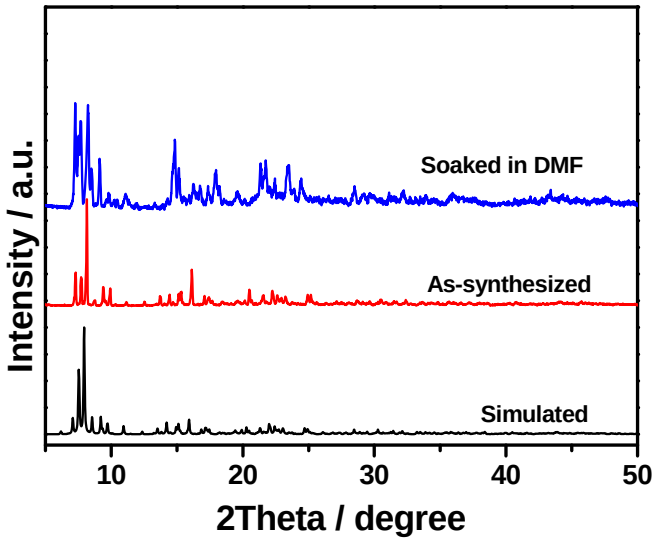

Fig. S11 XRD of **2** soaked in DMF solvent.

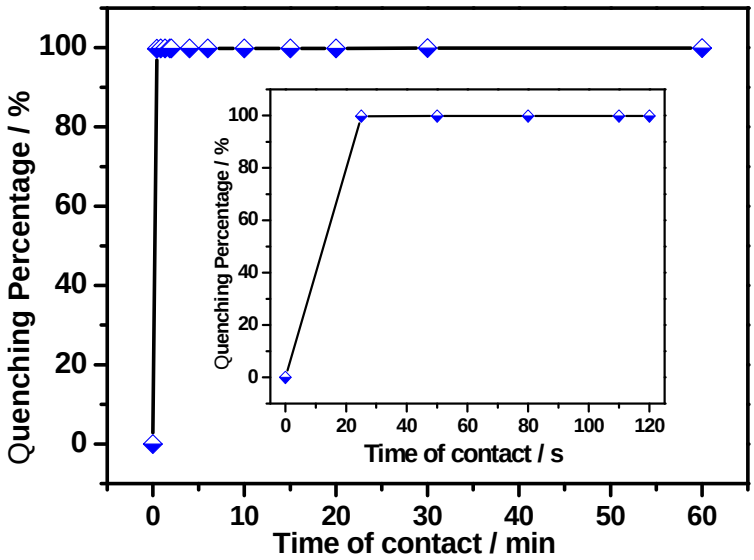

Fig. S12 Time-dependent fluorescence quenching by nitrobenzene of **2**. Inset: [Time] $\leqslant$ 2 min.

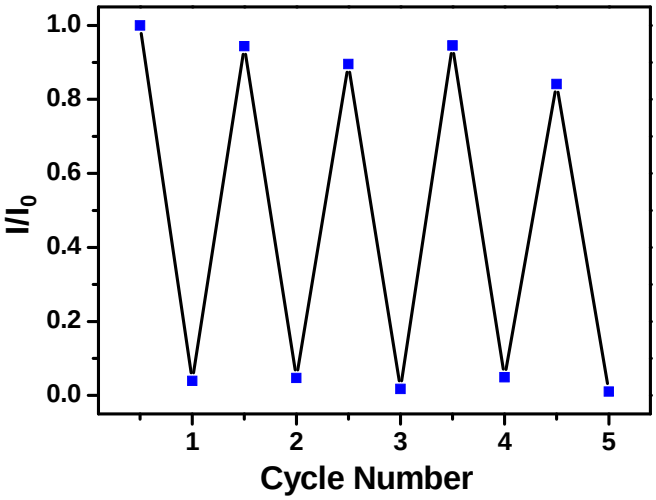

Fig. S13 Recyclability tests of 2 in the presence of nitrobenzene.

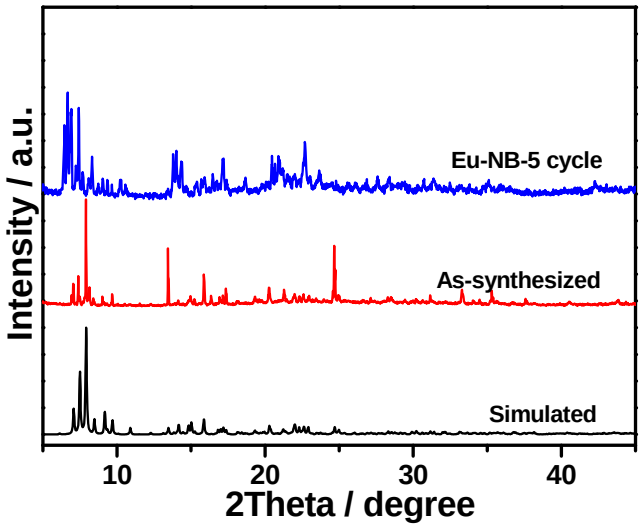

Fig. S14 XRD of **1** after 5 cycles for sensing nitrobenzene.

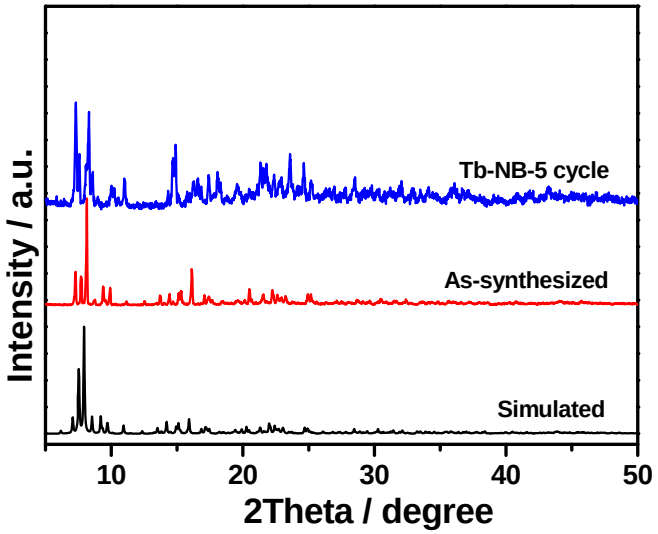

Fig. S15 XRD of **2** after 5 cycles for sensing nitrobenzene.

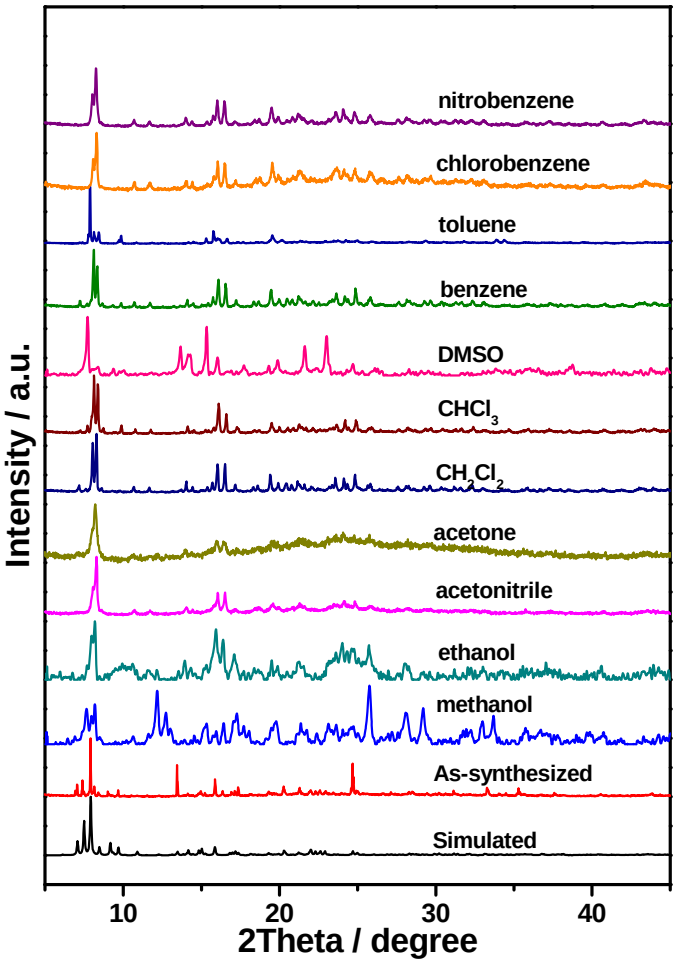

Fig. S16 PXRD of **1** after soaking in different solvents.

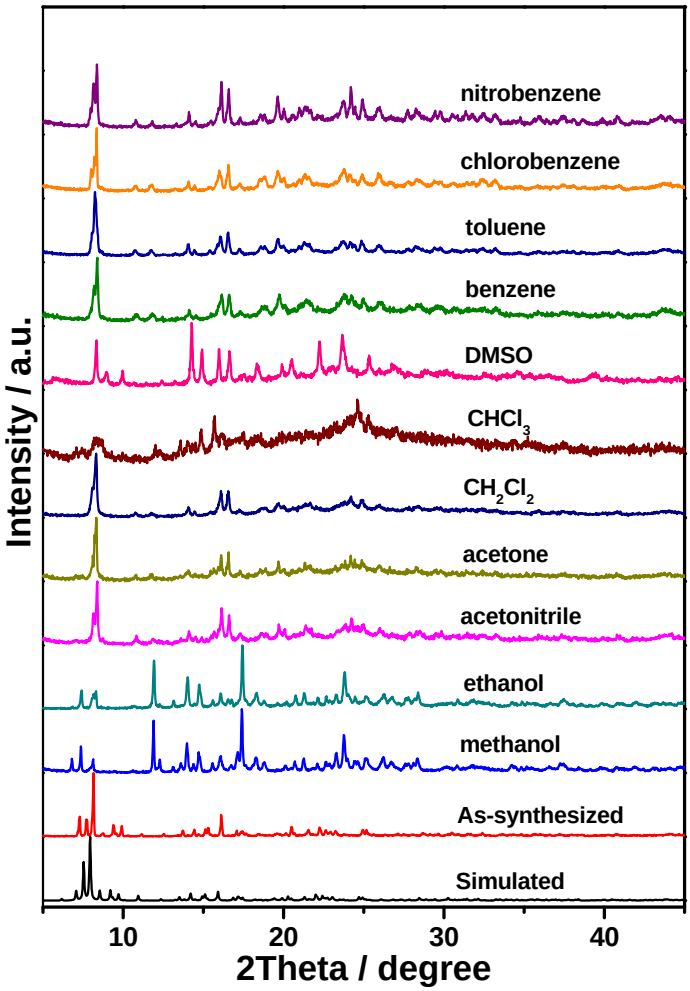

Fig. S17 PXRD of **2** after soaking in different solvents.

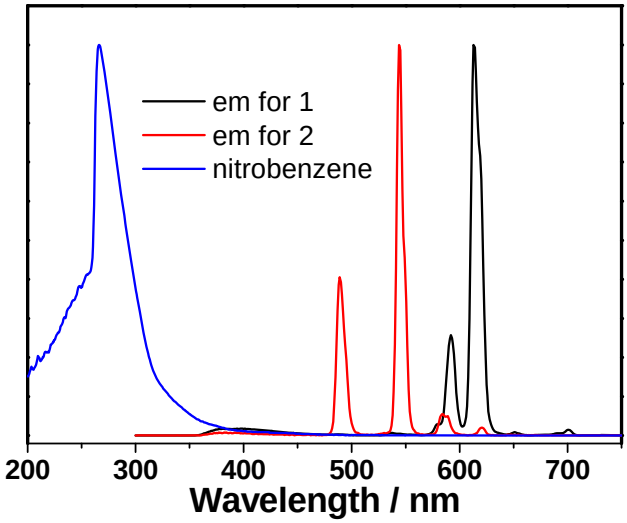

Fig. S18 The emission spectra of **1** and **2** (dispersed in DMF) and Uv-vis absorption spectrum of nitrobenzene (in DMF).

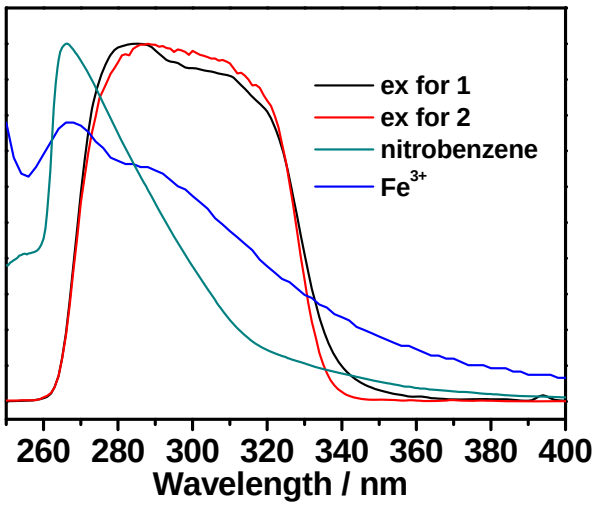

Fig. S19 The excitation spectra of **1** and **2** (dispersed in DMF) and Uv-vis absorption spectrum of nitrobenzene and $Fe(NO_3)_3$ in DMF.

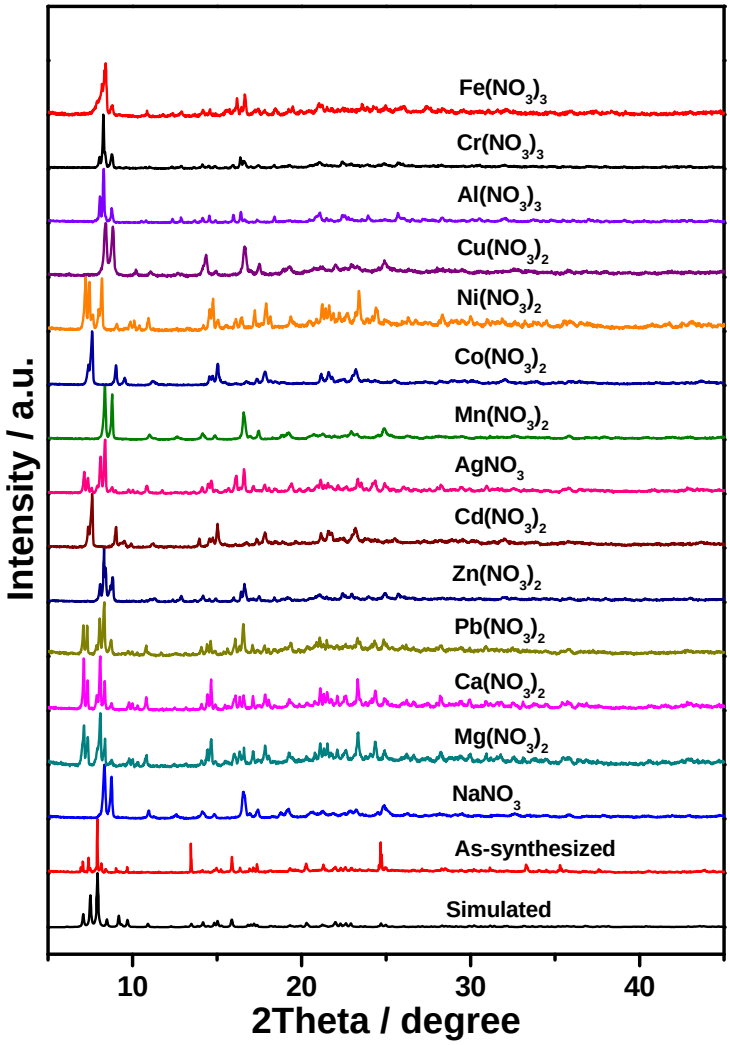

Fig. S20 PXRD of **1** after soaking different metal ions in DMF

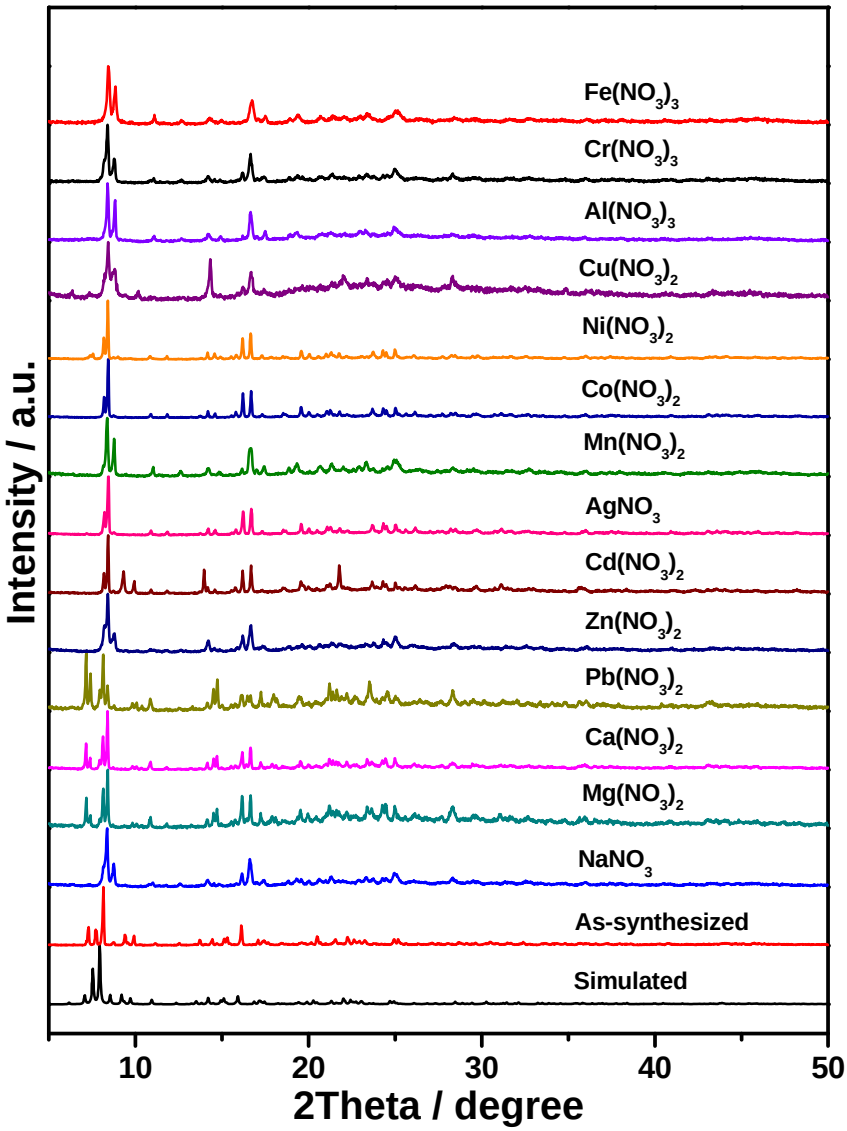

Fig. S21 PXRD of **2** after soaking different metal ions in DMF.

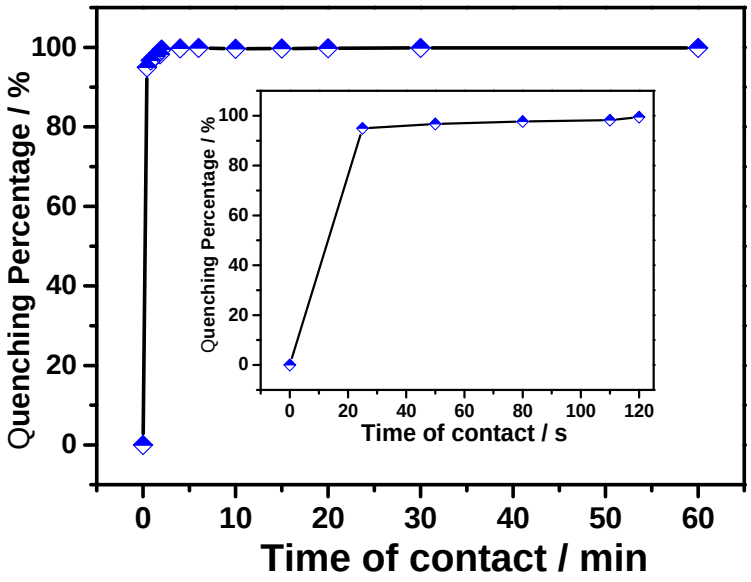

Fig. S22 Time-dependent fluorescence quenching by Fe^{3+} of **2**. Inset: [Time] $\leqslant$ 2 min.

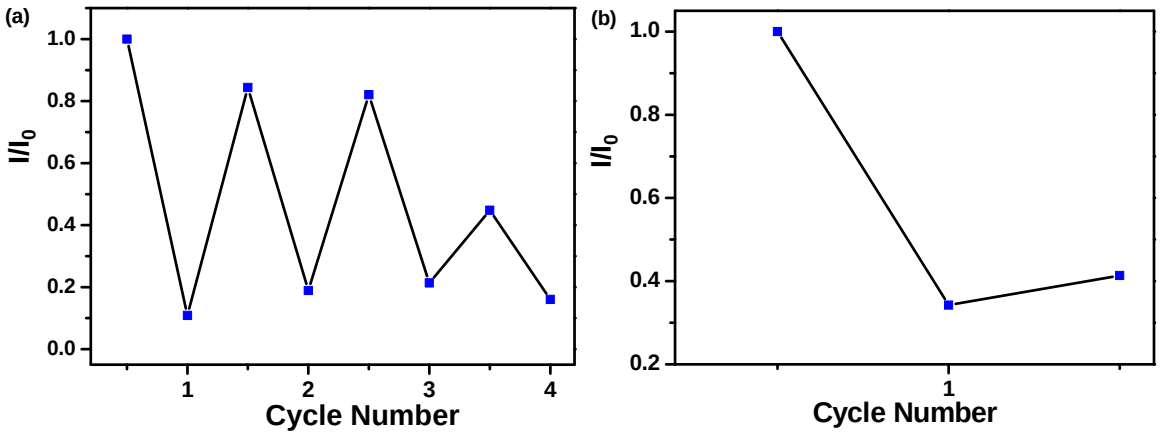

Fig. S23 Recyclability tests for **1**(a) and **2** (b) in the presence of Fe^{3+} washed only with DMF.

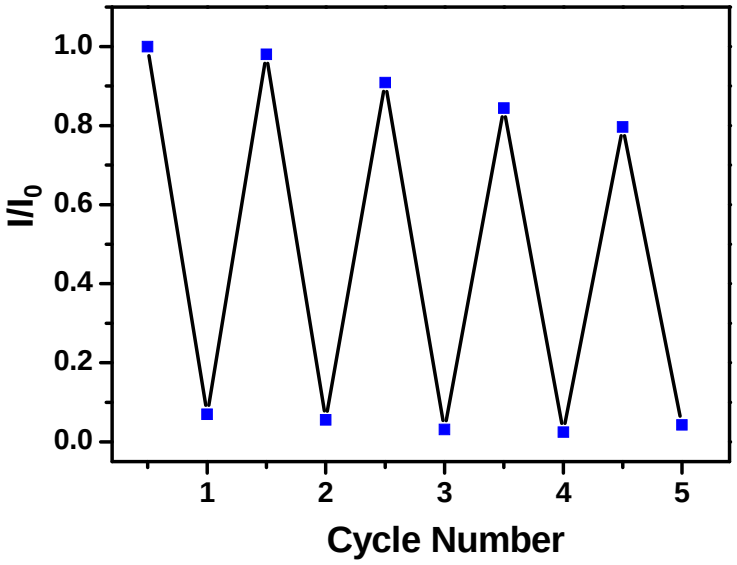

Fig. S24 Recyclability tests of **2** in the presence of Fe^{3+}.

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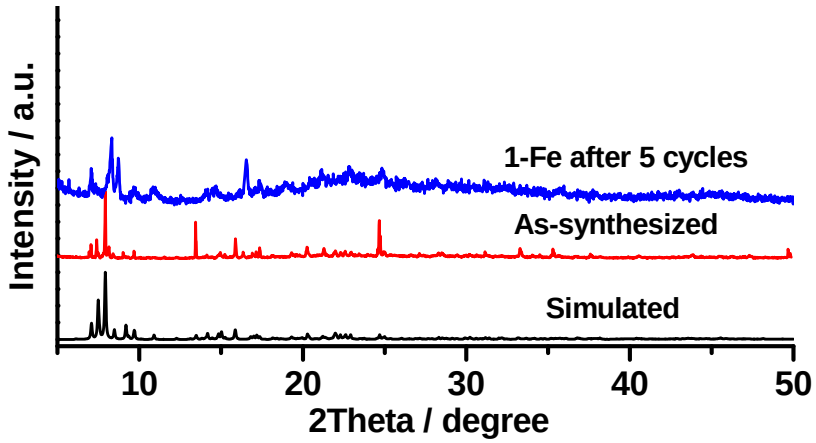

Fig. S25 XRD of **1** after 5 cycles for sensing Fe^{3+}.

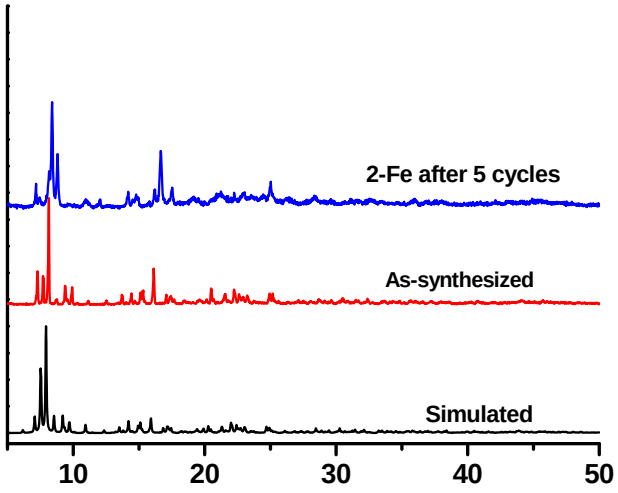

Fig. S26 XRD of **1** after 5 cycles for sensing Fe^{3+}.

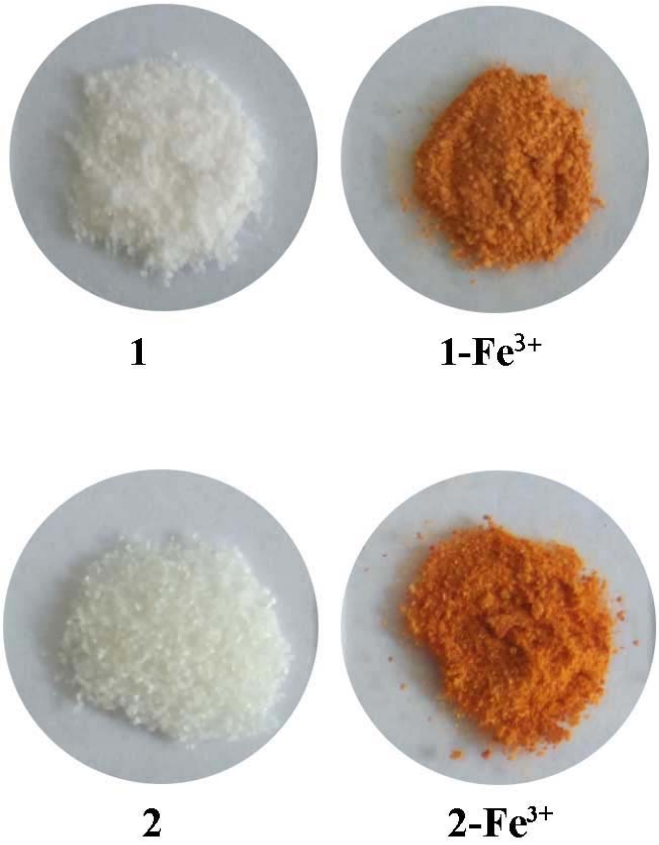

Fig. S27 The photographs of **1**, **2** and Fe^{3+}-incorporated **1** and **2**.

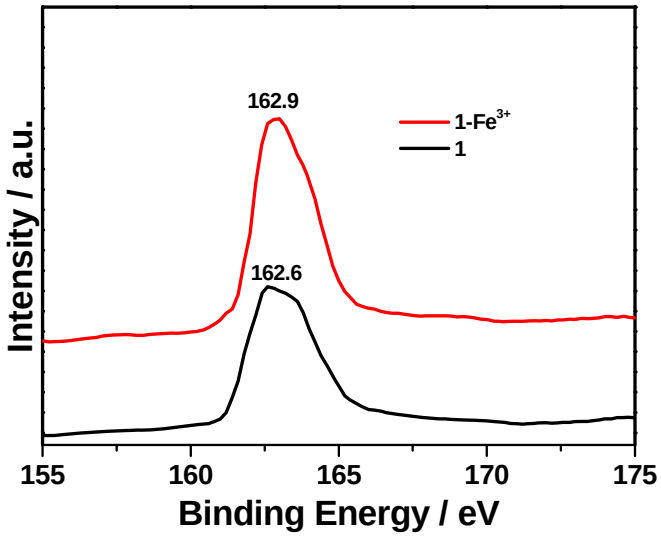

Fig. S28 S2p XPS spectra of **1** before (black) and Fe^{3+}-incorporated **1** (red).

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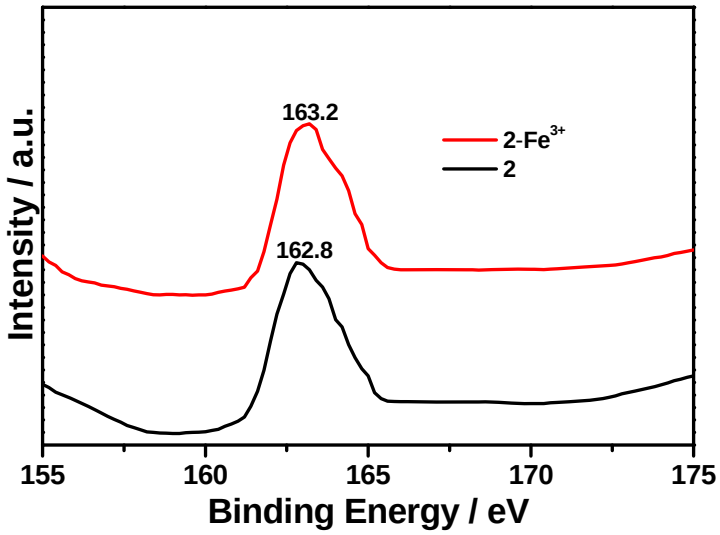

Fig. S29 S2p XPS spectra of **2** before (black) and Fe^{3+}-incorporated **2** (red).

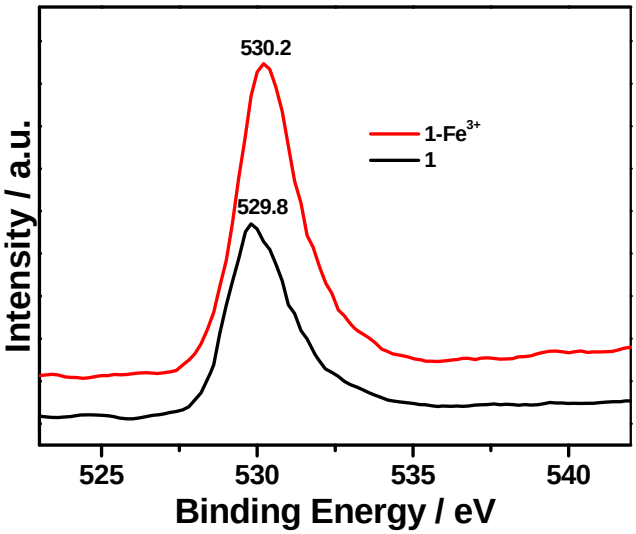

Fig. S30 O1s XPS spectra of **1** before and after immersed in Fe^{3+}.

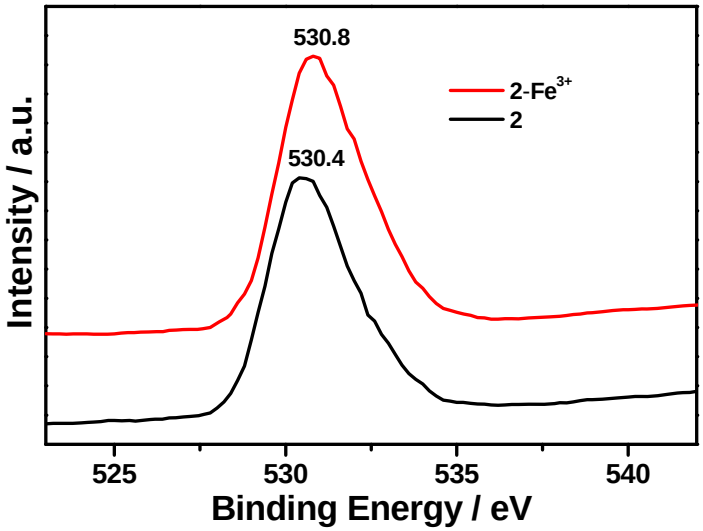

Fig. S31 O1s XPS spectra of **2** before (black) and Fe^{3+}-incorporated **2** (red).