Electronic Supplementary Information

Modulating fluorescence properties of excited-state intramolecular proton transfer (ESIPT) based metal organic frameworks by metal polarization

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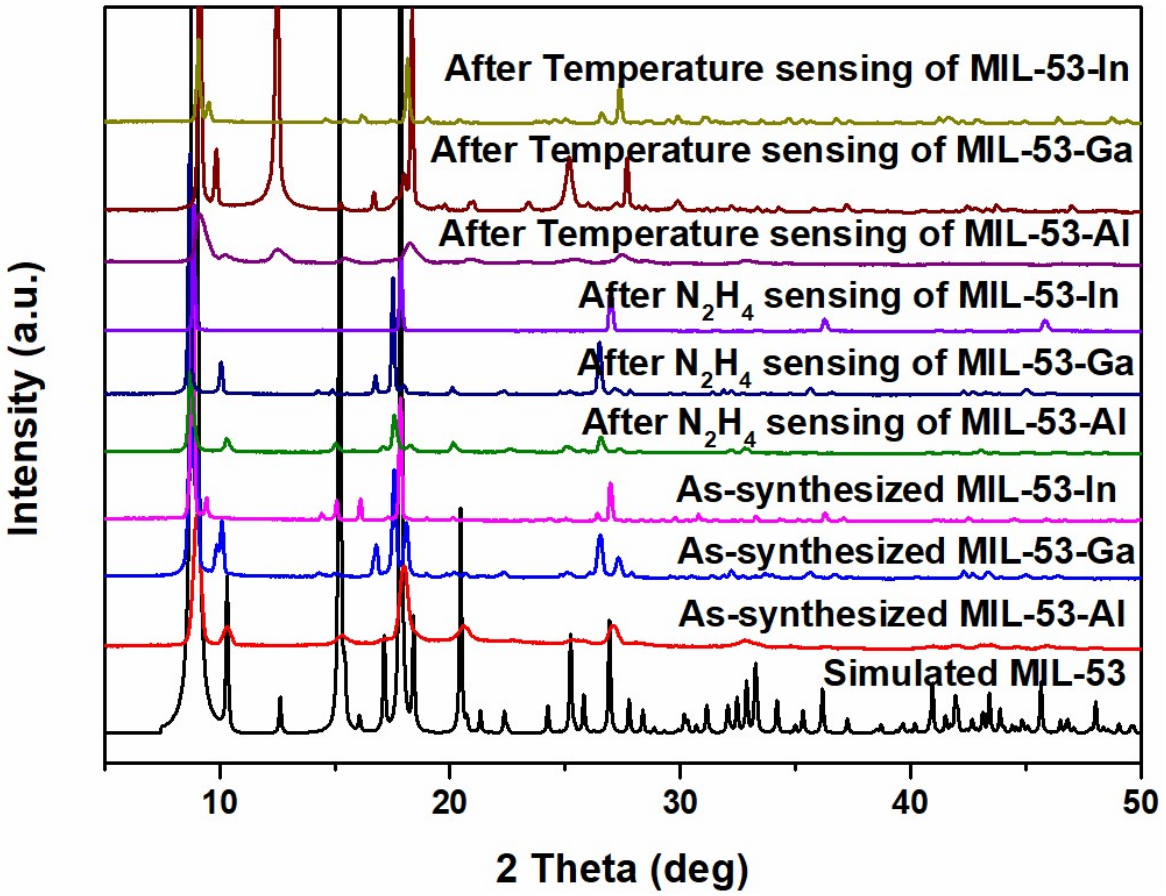

Fig. S1. PXRD patterns of MIL-53-Al/Ga/In as-prepared, after N_2H_4 sensing and temperature sensing.

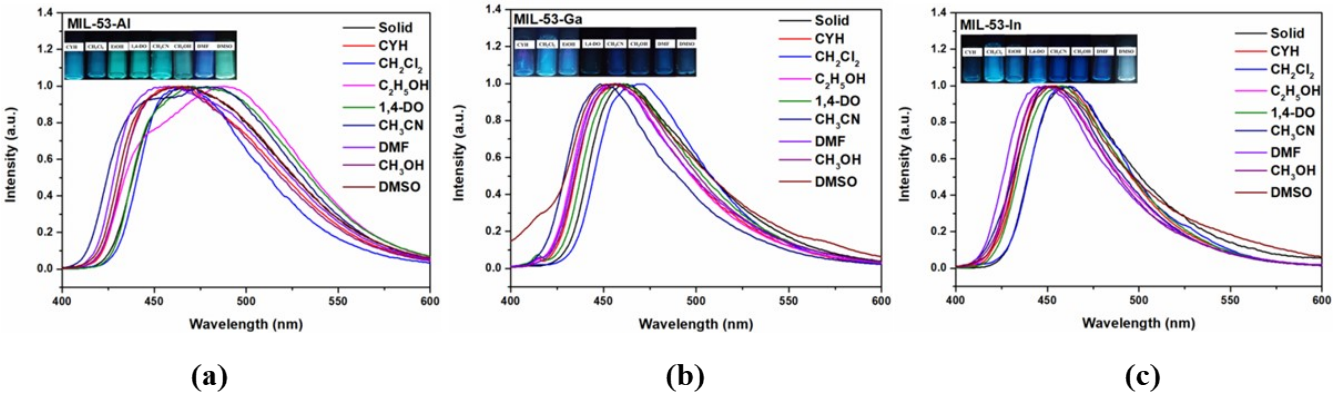

Fig. S2. Fluorescence emission spectra of MIL-53-Al/Ga/In in different solvents.

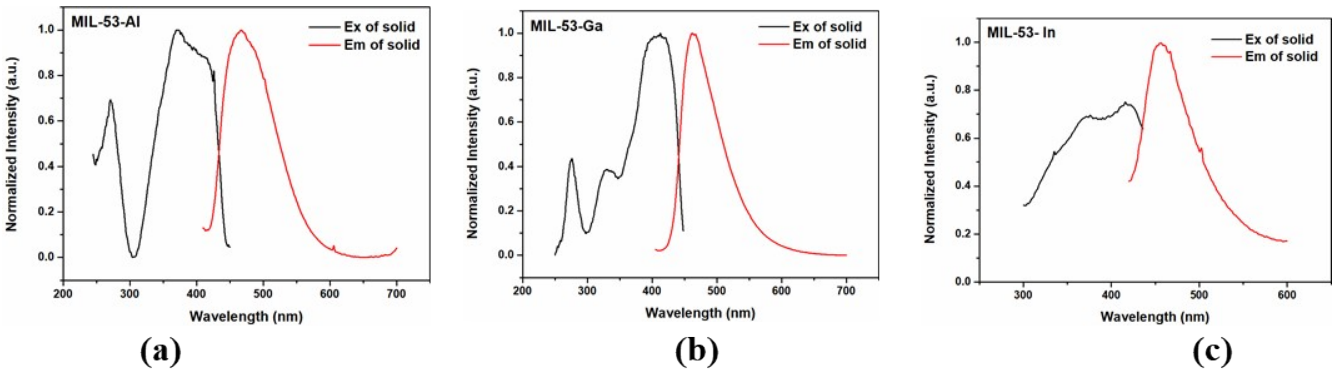

Fig. S3. Solid-state fluorescence emission spectra of MIL-53-Al/Ga/In.

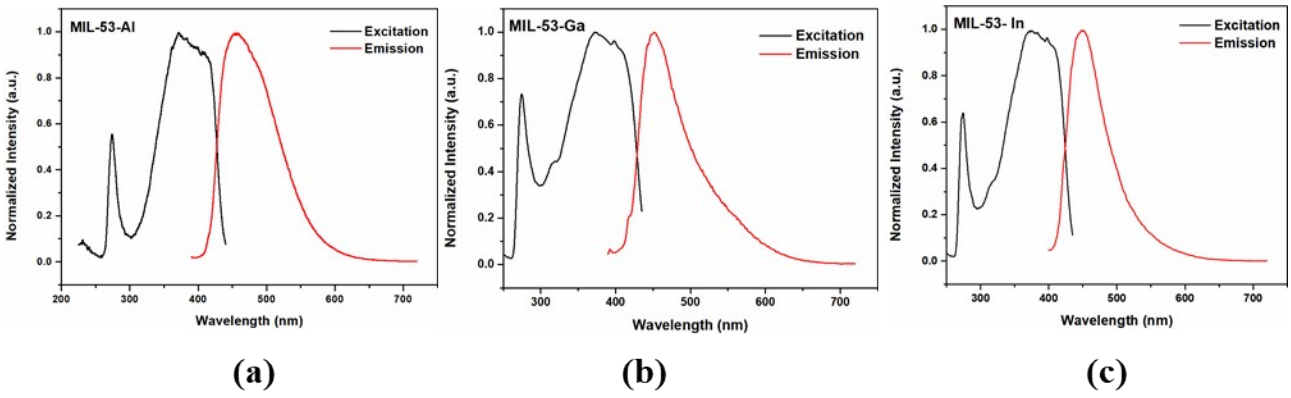

Fig. S4. Fluorescence emission spectra of MIL-53-Al/Ga/In suspension in DMF.

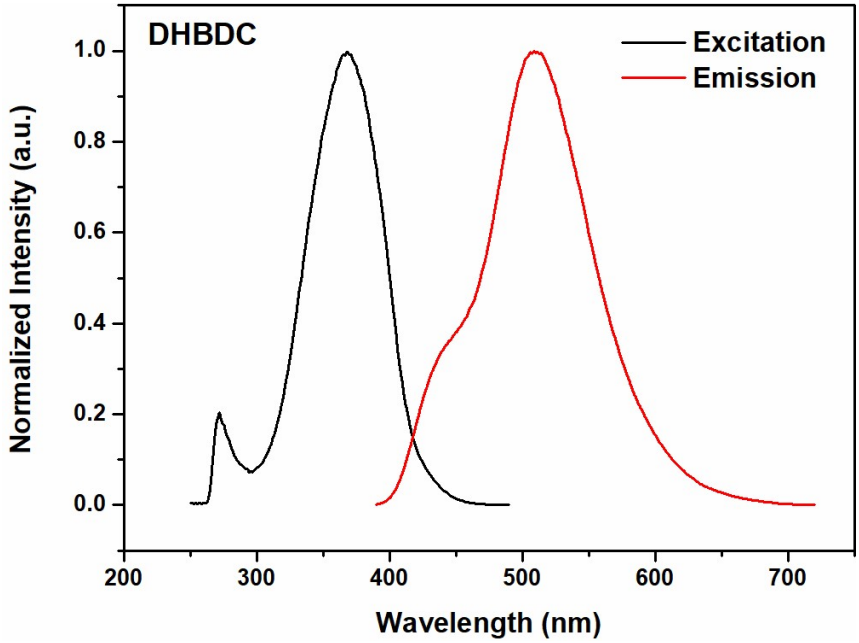

Fig. S5. Fluorescence emission spectra of DHBDC in DMF.

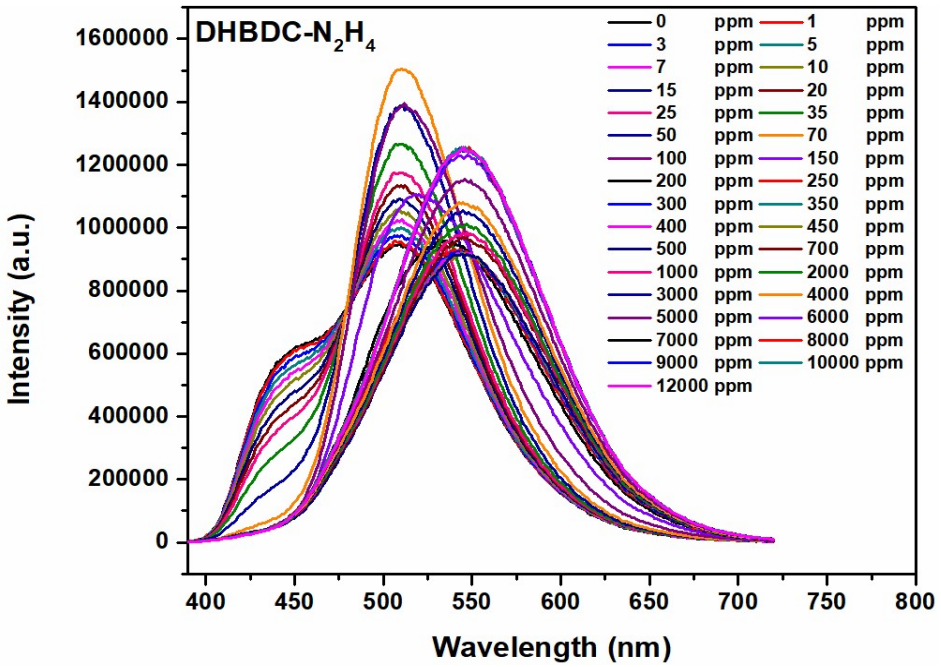

Fig. S6. Fluorescence spectra of N_2H_4 detected by DHBDC.

* In order to minimize the volatilization of N_2H_4, a freshly prepared N_2H_4 solution in DMF was used, quickly added to the probe suspension and covered with a colorimetric cap. Due to the low concentration of N_2H_4 (ppm level) added in the detection, and the continuous increase of N_2H_4 concentration in the same MOF suspension for spectra measurement, it has little impact on the accuracy of the detection.

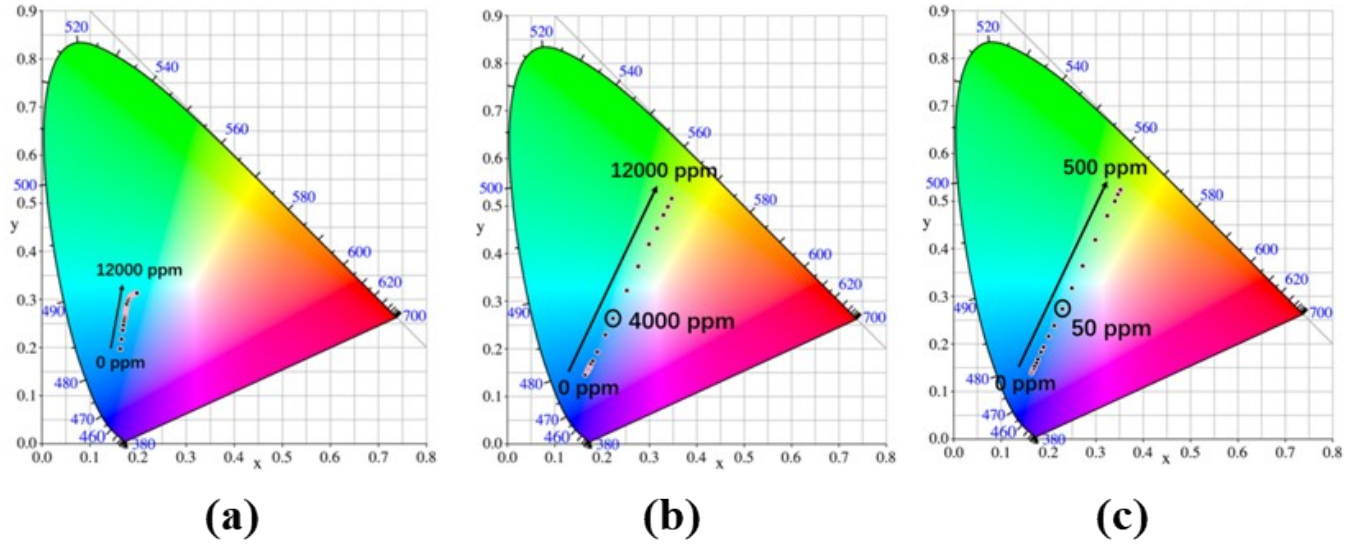

Fig. S7. The CIE chromaticity diagram of MIL-53 sensing process for N_2H_4: (a) MIL-53-Al; (b) MIL-53-Ga; (c) MIL-53-In.

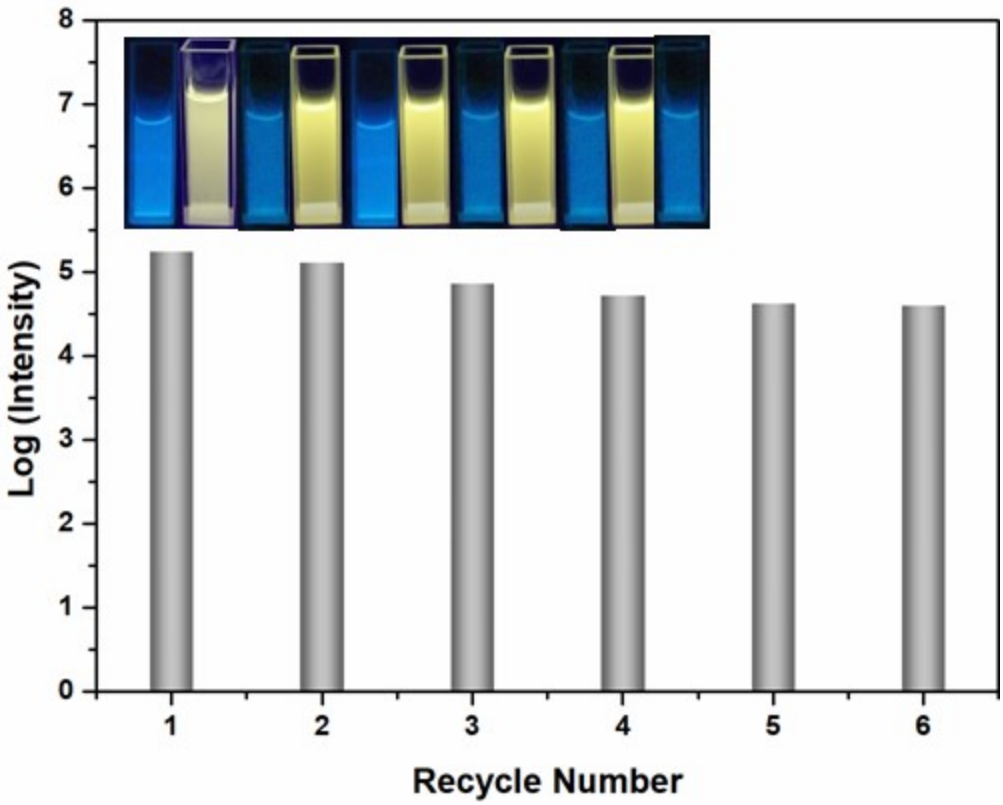

Fig. S8. The cyclic detection process of MIL-53-Ga for N_2H_4 (12000 ppm) sensing.

* The MOF suspension after hydrazine detection was centrifuged, washed and centrifuged 5 times by DMF, and dried by N_2 with suitable flow rate, which can be well regenerated as detailed in Fig. 4(a) and Fig. S8.

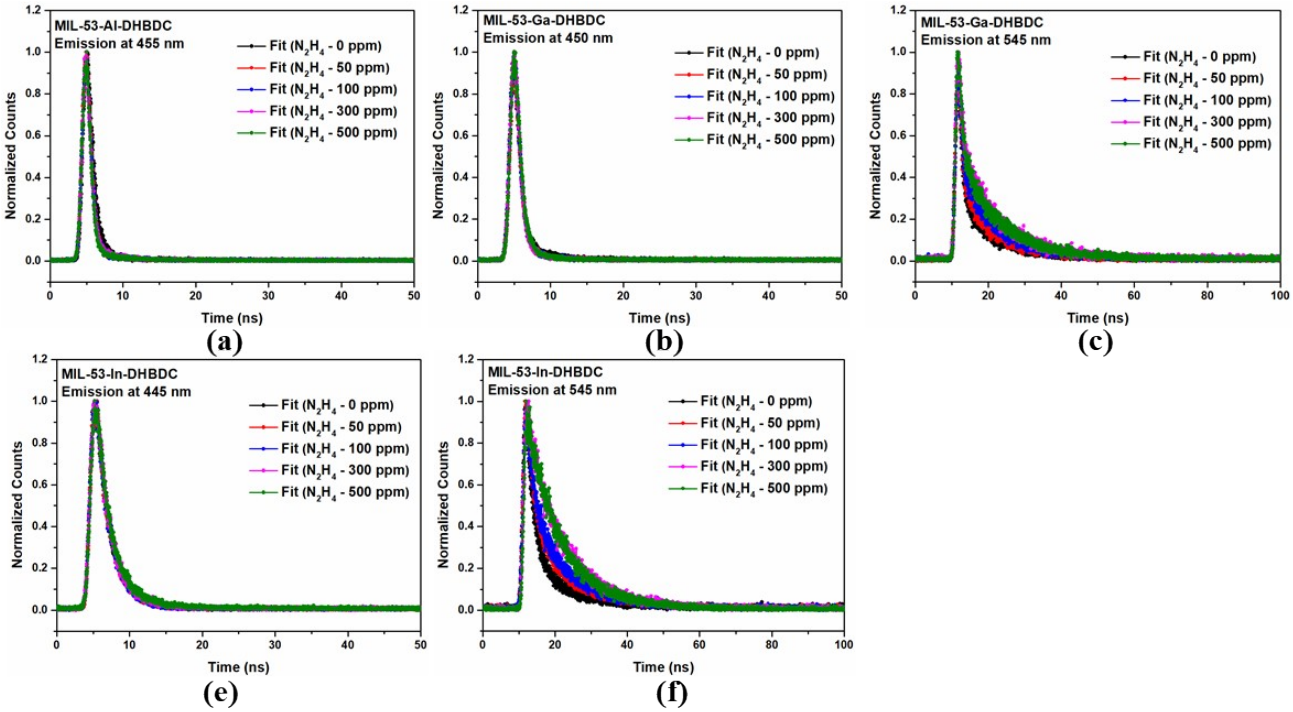

Fig. S9. Normalized fluorescent time-correlated decay curves of MIL-53: (a) MIL-53-Al at 455 nm; (b) MIL-53-Ga at 450 nm (c) MIL-53-Ga at 545 nm (d) MIL-53-In at 445 nm (e) MIL-53-In at 545 nm.

Table S1. Average fluorescence lifetime and quantum yield of MIL-53-Al/Ga/In with different concentrations of N_2H_4

$[N_2H_4]$ (ppm)	Average lifetime		Quantum yield （%）	Average lifetime		Quantum yield （%）	Average lifetime	Quantum yield （%）
	445 nm (ns)	545 nm (ns)		450 nm (ns)	545 nm (ns)		445 nm (ns)	
	In			Ga			Al	
0	2.17	7.41	11.3	1.94	7.99	6.1	1.26	25.1
50	2.22	8.77	11.8	1.58	8.40	5.5	1.25	25.4
100	2.23	9.62	19.1	1.59	9.12	5.7	1.22	25.7
300	2.69	10.06	35.6	1.49	9.89	6.1	1.27	25.6
500	3.03	10.01	45.1	1.38	9.89	6.2	1.31	25.9

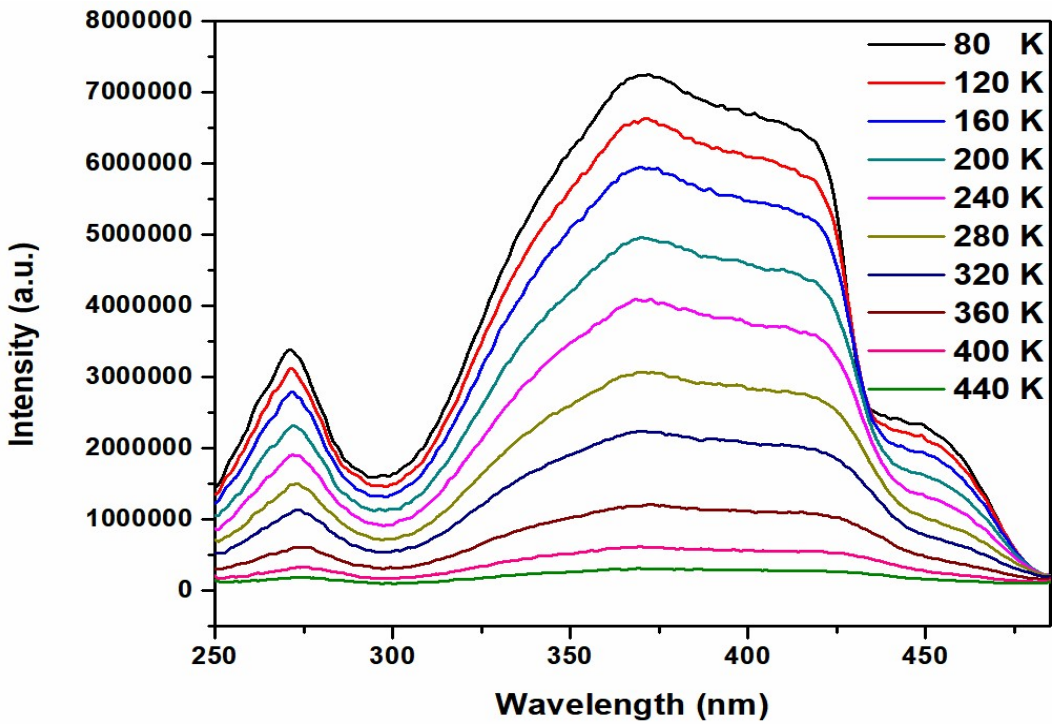

Fig. S10. Temperature dependent fluorescence excitation spectra of MIL-53-Al.

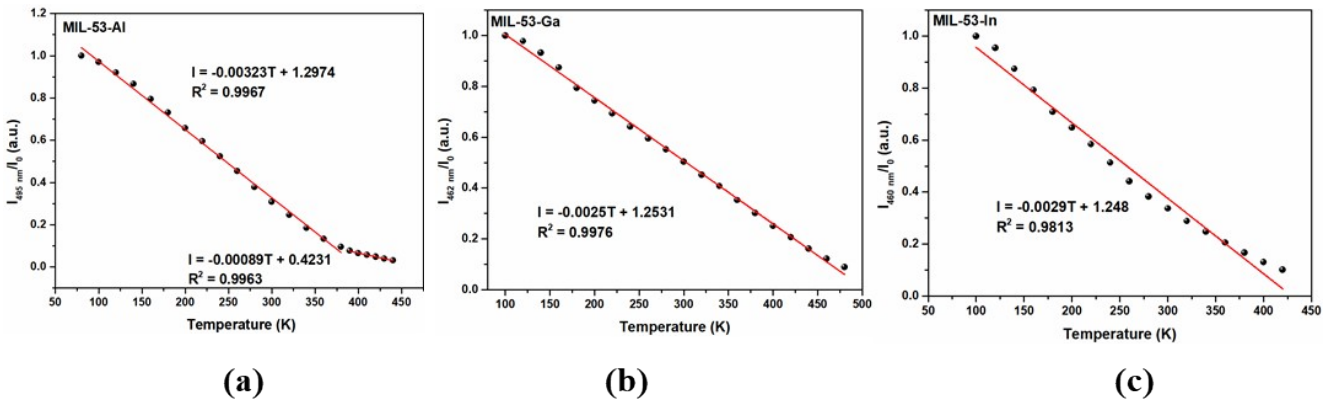

Fig. S11. Linear fitting diagrams of MIL-53 fluorescence intensity to temperature.

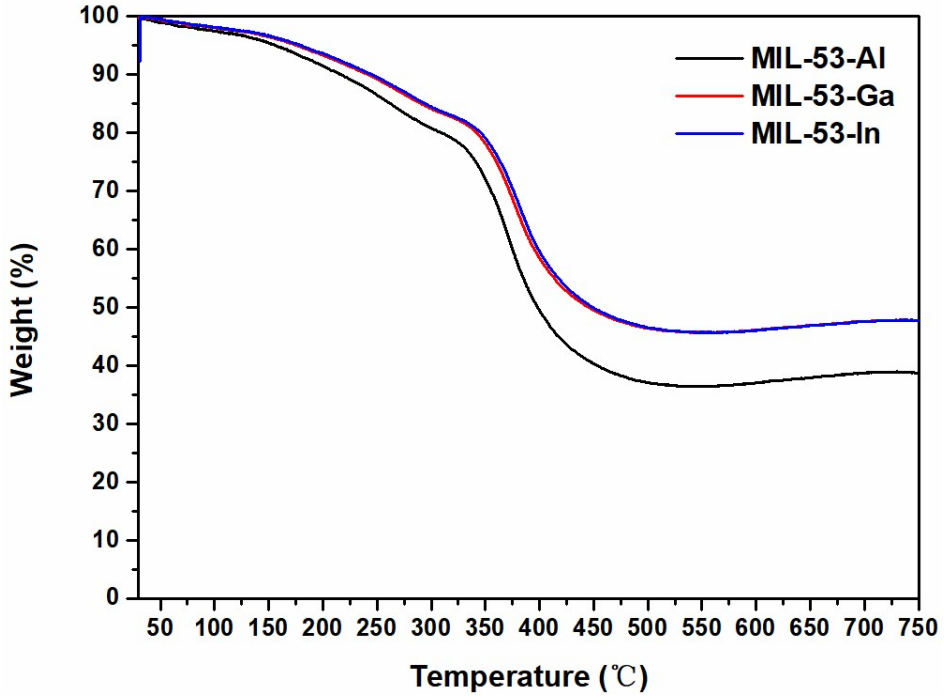

Fig. S12. TGA curves for MIL-5 MOFs.