Supporting Information

A fluorescent triazine-based covalent organic frameworks as highly sensitive fluorescent probes for Fe^{3+} ions

Guo Hao*, Yinsheng Liu, Ning Wu, Liping Peng, Xiaoqin Wei,

Zongyan Lu, Zhiguo Yu, Wu Yang*

Key Lab of Eco-Environments Related Polymer Materials of MOE,

Key Lab of Bioelectrochemistry and Environmental Analysis of Gansu Province, College of Chemistry and Chemical Engineering, Northwest Normal University, Gansu International Scientific and Technological Cooperation Base of Water-Retention Chemical Functional Materials, Lanzhou 730070, P R China.

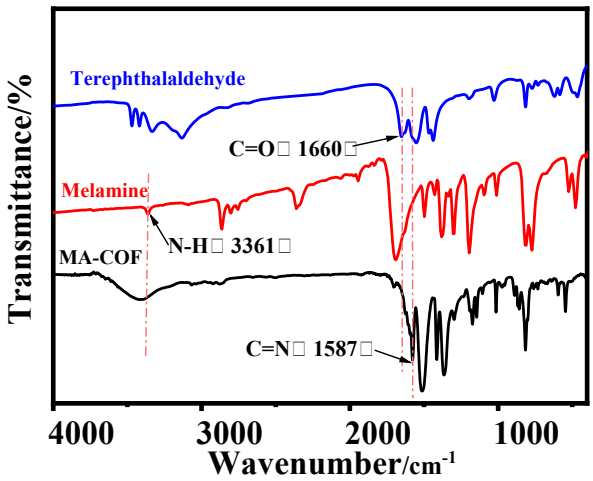


Figure S1. FT-IR spectra of MaTa-COF

Lanzhou 730070, Gansu, P. R. China)
Email:xbsfda123@126.com (W Yang) and haoguo12@126.com (H Guo).

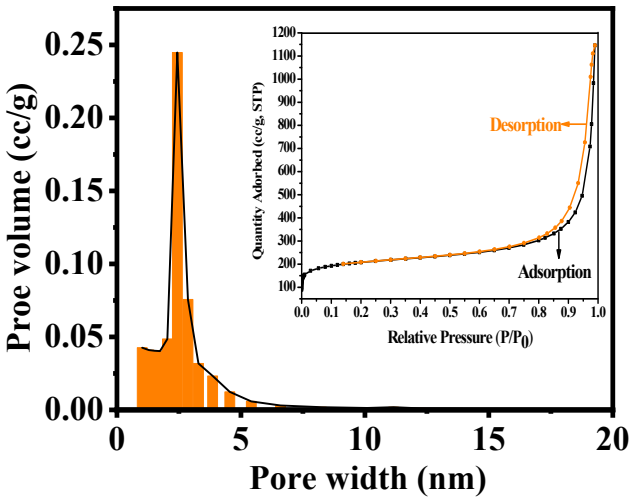


Figure S2. Pore size distribution of MaTa-COF. **Inset:** N_2 adsorption and desorption isotherm for MaTa-COF measured at 77 K.

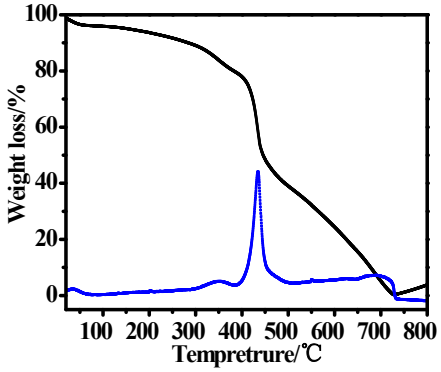
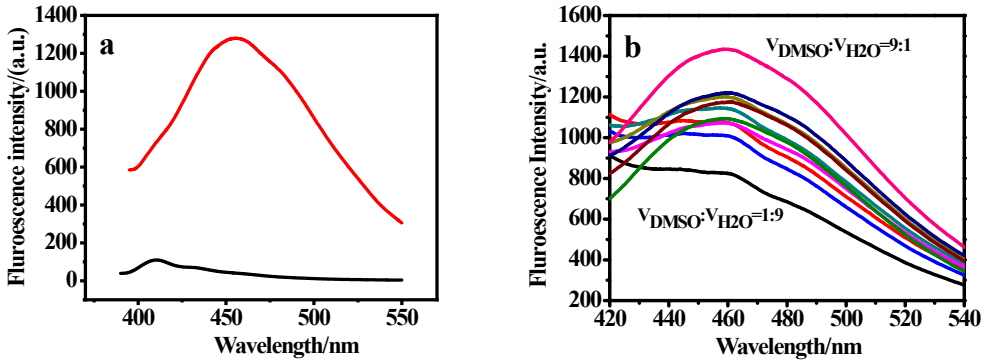


Figure S3. Thermogravimetric curves of MaTa-COF nanoparticles



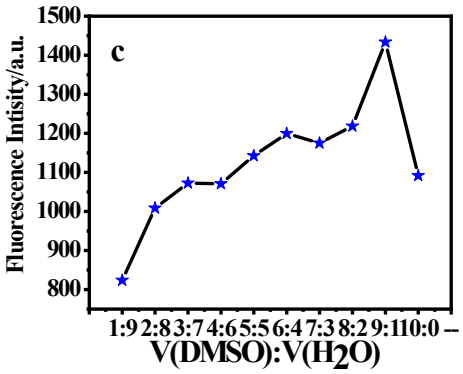


Figure S4. (a) Fluorescence spectra of DMSO (black curve) and MaTa-COF in DMSO (red curve); **(b)** Fluorescent spectra of MaTa-COF in the mixture solvents with different ratio (DMSO: H_2O(V/V) = 0:10, 1:9, 2:8, 3:7, 4:6, 5:5, 6:4, 7:3, 8:2, 9:1, 10:0); **(c)** Fluorescence intensities under different DMSO/H_2O volume ratios.

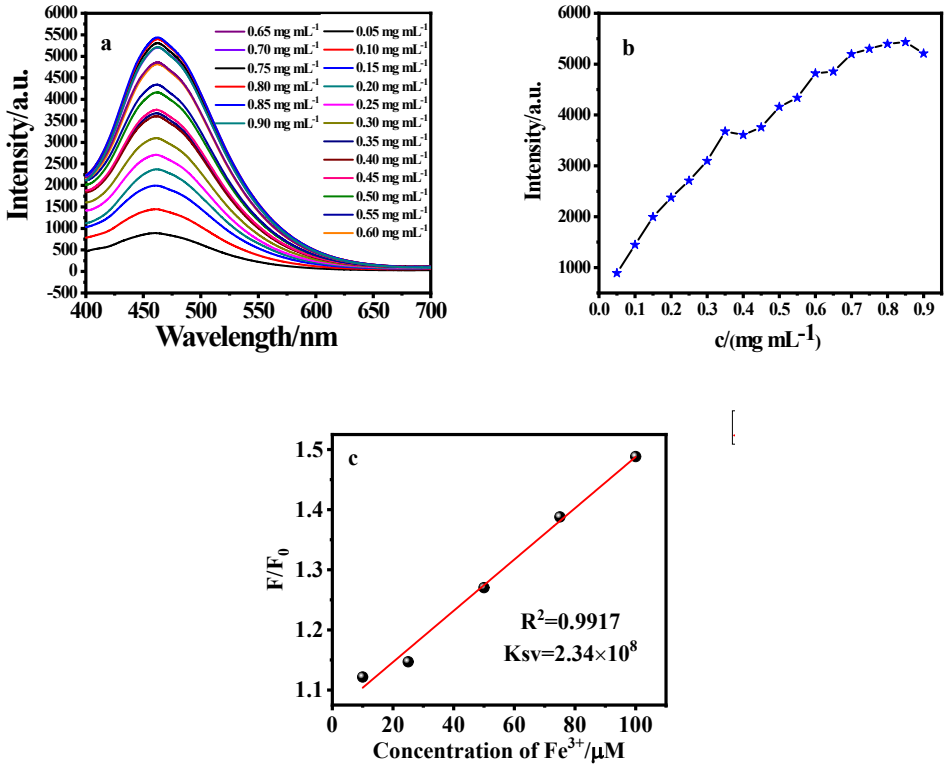


Figure S5. (a) Fluorescent spectra of MaTa-COF of different concentrations; **(b)** Fluorescence intensity change with the COF concentration; **(c)** Stern-Volmer plot.

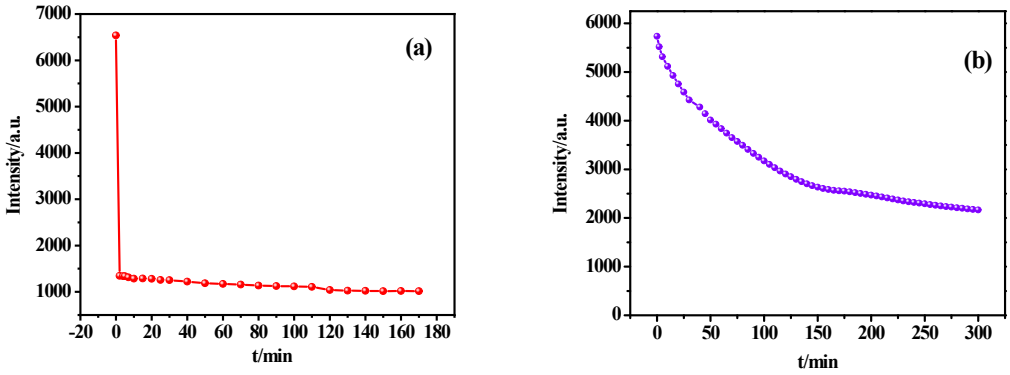


Figure S6. Time-dependent fluorescence quenching by Fe^{3+}**(a)** and Ag^{+}**(b)**.

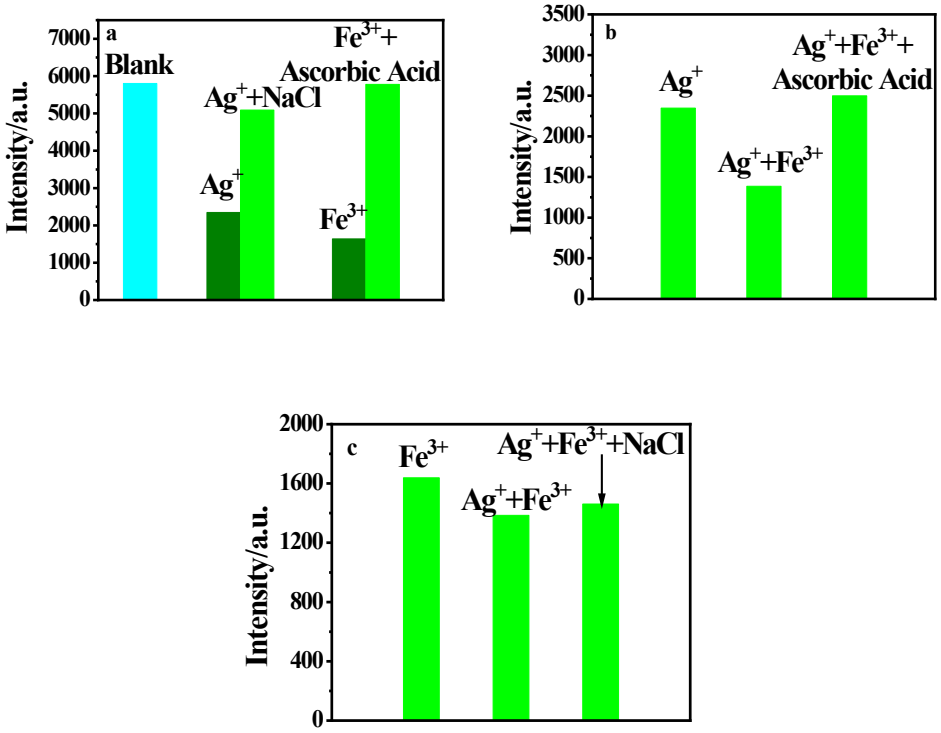
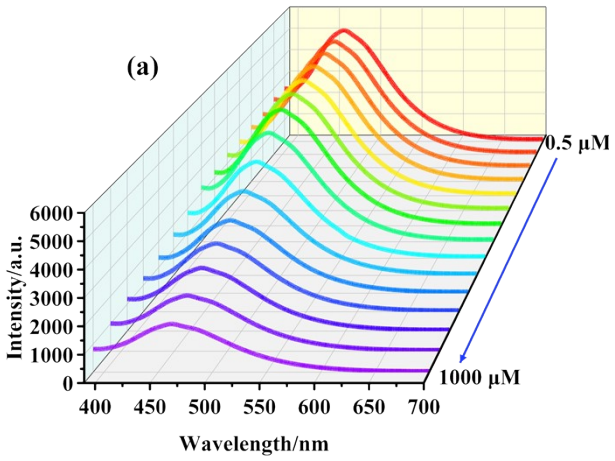
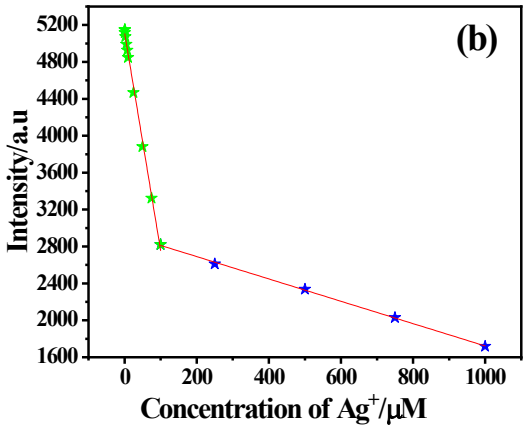


Figure S7. Recovery of fluorescence intensity of MaTa-COF suspension.





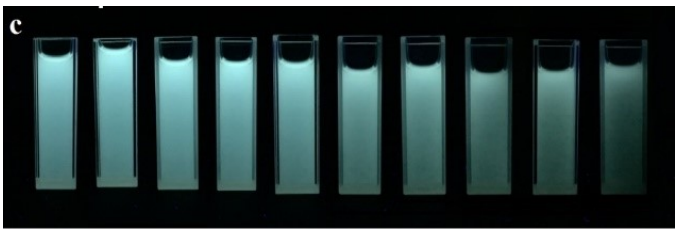


Figure S8. (a) Fluorescence spectra of MaTa-COF in the presence of different concentrations of Ag^+; **(b)** The linear relationship between the fluorescence intensity and the Ag^+ concentration ($I = 2932.8904 – 1.2106C_{Ag+}$ ($R^2 = 0.9990$) in the range of 100 to 1000 μM, and $I = 5117.589 – 23.6021C_{Ag+}$ ($R^2 = 0.9971$) in the range of 0.50 to 100 μM), LOD = 1.41 μM(S/N = 3); **(c)** Optical images of the COF suspension with different concentrations of Ag^+

Table S1 Comparison of the Fe^{3+} detection properties of MaTa-COF with other fluorescence sensors reported in previous literatures.

Methods	Materials	Linear range (μM)	Detection Limits (μM)	References
Fluorescence	DNSE	0-100	3.45	[S1]
Fluorescence	Bth-Dma COF	0-100	0.17	[S2]
Fluorescence	NFCDs	0.2-150	0.14	[S3]
Fluorescence	Eu^{3+}@MIL-124	0-500	0.28	[S4]
Fluorescence	PI-COF 201	5.0–400	0.13	[S5]
	PI-COF 202	5.0-300	0.22	[S5]
Fluorescence	MaTa-COF	0-250	0.0618	This work

References

[S1] C. M. Sha, S. Z. Lu, F Lv and D.M. Xu, Res. Chem. Intermed., 2016, **42**,5825–5834

[S2] G. Chen, H. H. Lan, S. L. Cai, B. Sun, X. L. Li, Z. H. He, S. R. Zheng, J. Fan, Y. Liu and W. G. Zhang, ACS Appl. Mater. Interfaces, 2019,**11**,12830−1283

[S3] S. Ye, M. M. Zhang, J. Q. Guo, X. T. Yu, J. Song, P. G. Zeng, J. L. Qu, Y. Chen and H. Li, Molecules, 2022,**27**,6158

[S4] X. Y. Xu and B. Yan, ACS Appl. Mater. Interfaces, 2015,7,721−729

[S5] T. Wang, R. Xue, H.Q. Chen, P.L. Shi, X. Lei, Y.L. Wei, H. Guo and W. Yang, New J. Chem., 2017,41, 14272