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A two-dimensional cadmium-metal organic framework as an excellent probe: highly selective luminescent "turn on" detection of tetrahydrofuran and quantitative analysis of water

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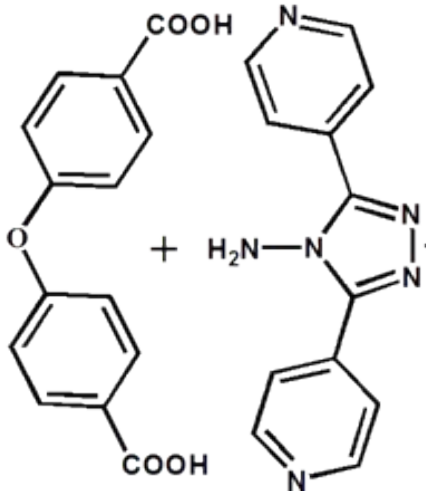

Fig. S1 The organic ligands of Cd-MOF.

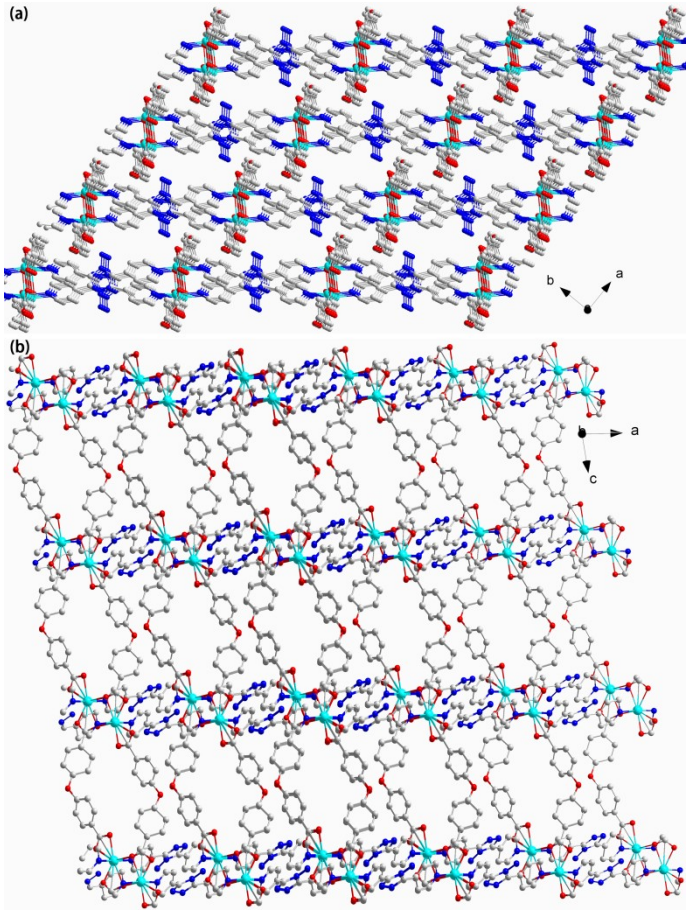

Fig. S2 The 3D porous structure diagram of Cd-MOF presented in different directions. Color codes: C in light grey, Zn in turquoise, N in blue, and O in red.

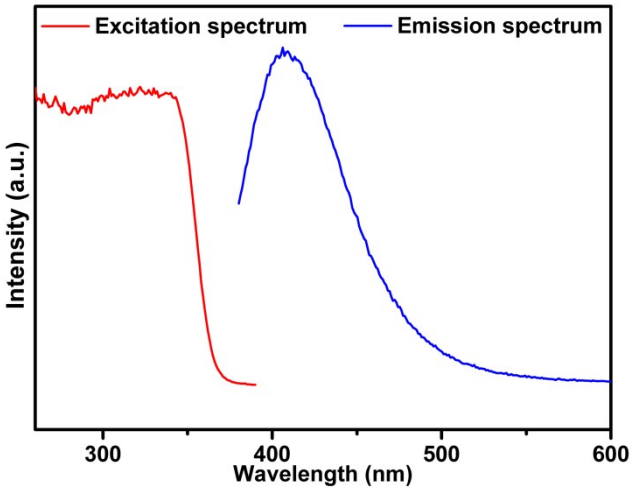

Fig. S3 The excitation spectrum and emission spectrum of as-synthesized Cd-MOF.

Table S1. The CIE coordinates of Cd-MOF under the excitation wavelengths of 290-400 nm using the CIE 1931 chromaticity diagram.

Excitation wavelength (nm)	CIE coordinates
290	(0.173,0.1116)
300	(0.1733,0.11)
310	(0.1729,0.1079)
320	(0.1729,0.1082)
325	(0.173,0.1089)
330	(0.1741,0.1113)
335	(0.1752,0.1149)
340	(0.1786,0.1238)
345	(0.1851,0.1416)
350	(0.1946,0.169)
355	(0.2105,0.209)
360	(0.2237,0.2437)
365	(0.2294,0.2605)
370	(0.2308,0.2676)
380	(0.2319,0.2747)
390	(0.2344,0.2877)
400	(0.2406,0.3097)

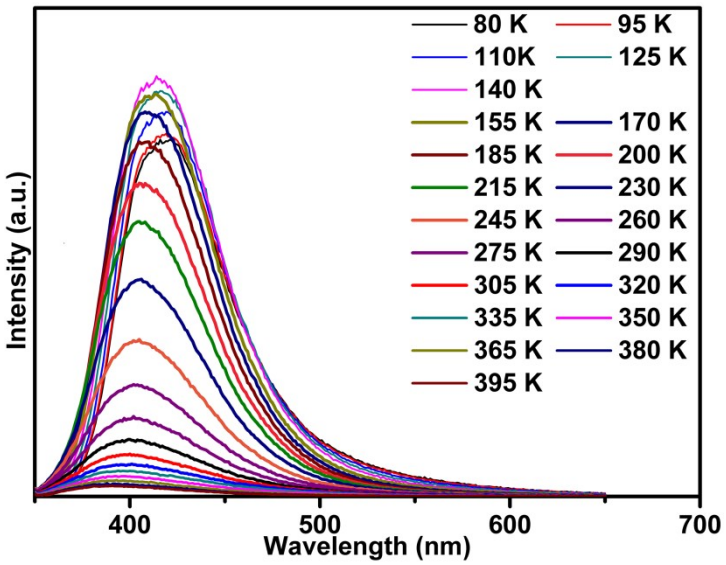

Fig. S4 Solid-state emission spectra of Cd-MOF measured at 80 K-395 K.

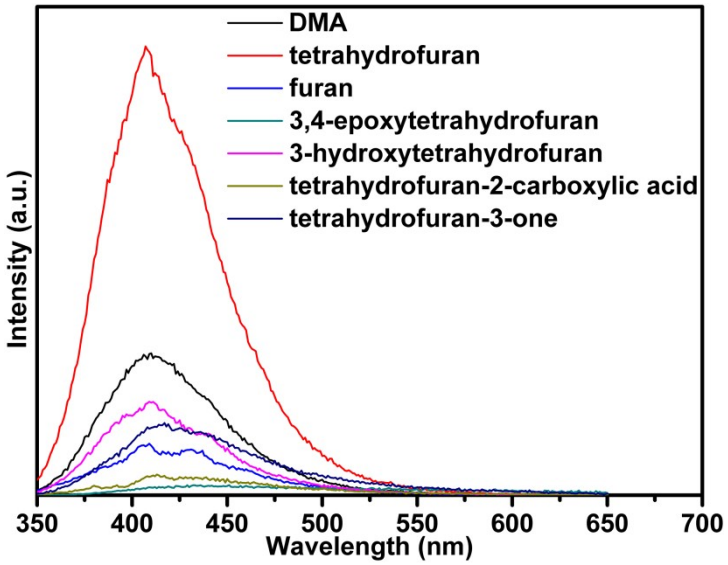

Fig. S5 Luminescent spectra of Cd-MOF dispersed in different THF structural analogues.

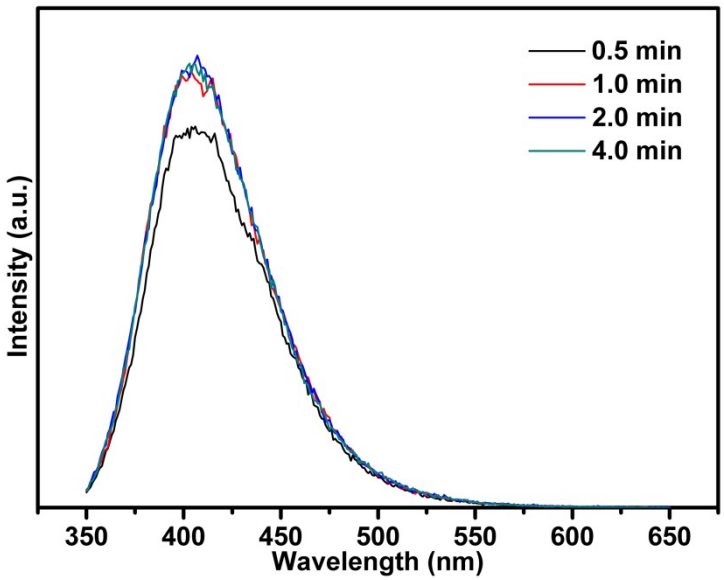

Fig. S6 Emission spectra of Cd-MOF immersed in THF at various time intervals (λ_{ex} = 340 nm).

Table S2. Comparison of detection methods and response time among other reported materials and Cd-MOF as the THF sensor.

Compound name	detection methods	response time	References
$[Cu_2(bdc)_2(bpy)]$	luminescent "turn off"	<1 min	J. Solid State Chem., 2020, 288, 121397
Sm-2_e	luminescent "turn off"	5 s	Analyst, 2019, 144, 5254-5260
PCN-224	luminescent "turn off"	not mention	J. Solid State Chem., 2020, 282, 121103
PANI-HCl film	electrochemical sensing	400 s	Applied Chemical Indusity, 2011, 40, 1336-1339
CuPcS	electrochemical sensing	190 s	Dyes and Pigments, 2023, 216, 111328
Py-3T	luminescent "turn on"	100 s	Imaging Science and Photochemistry, 2015, 33, 67-76
$[(CuCN)_3L{\cdot}(guest)_x]_n$	horizontal (wavelength) and vertical (intensity) changes of the emission spectra	not mention	Chem. Sci., 2013, 4, 1793-1801
Eu-MOF	luminescent "turn on"	1 min	Dalton Trans., 2018, 47, 6210-6217
Cd-MOF	luminescent "turn on"	<1 min	This work

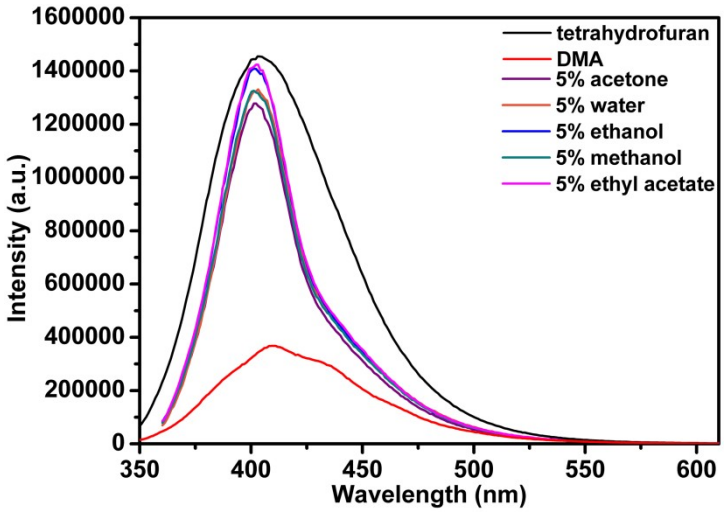

Fig. S7 Luminescent normalized intensity of Cd-MOF dispersed in THF containing 5% different organic solvents

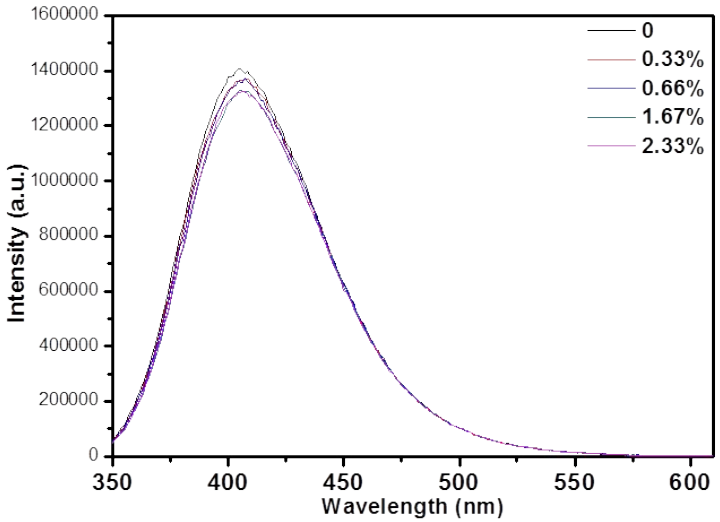

Fig. S8 Luminescent spectra of Cd-MOF THF suspension after treated with varying amounts of H_2O.

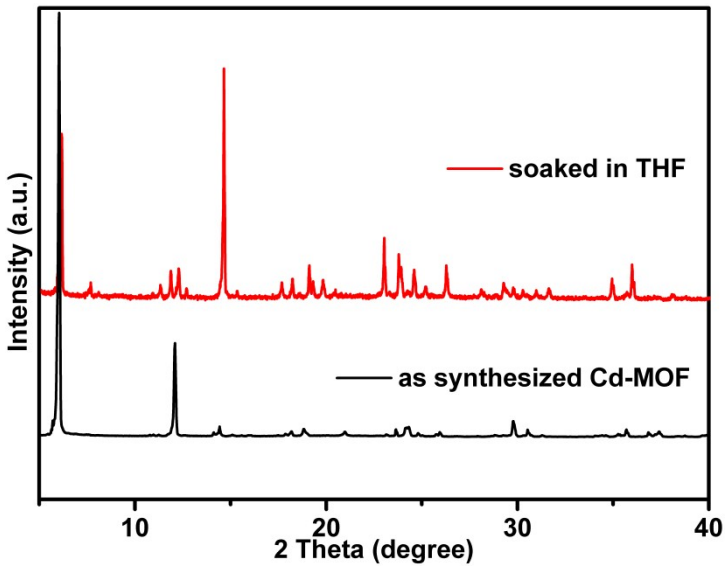

Fig. S9 The PXRD spectra of Cd-MOF as soaked in THF.

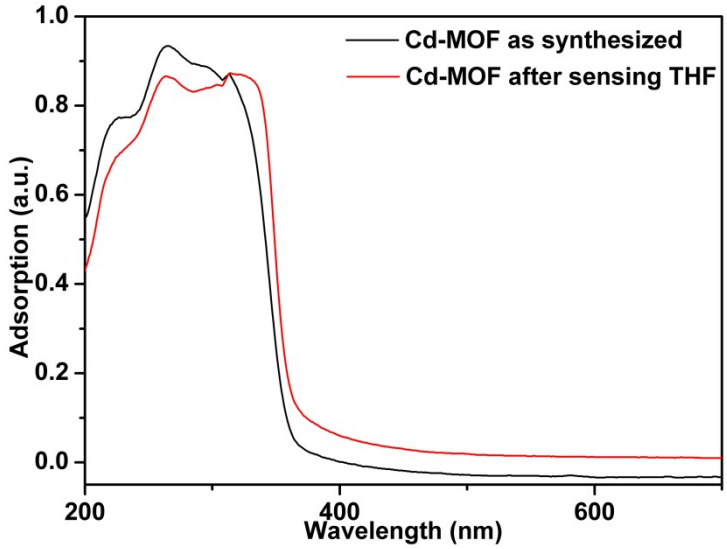

Fig. S10 The UV-Vis adsorption spectra of Cd-MOF before and after sensing THF.

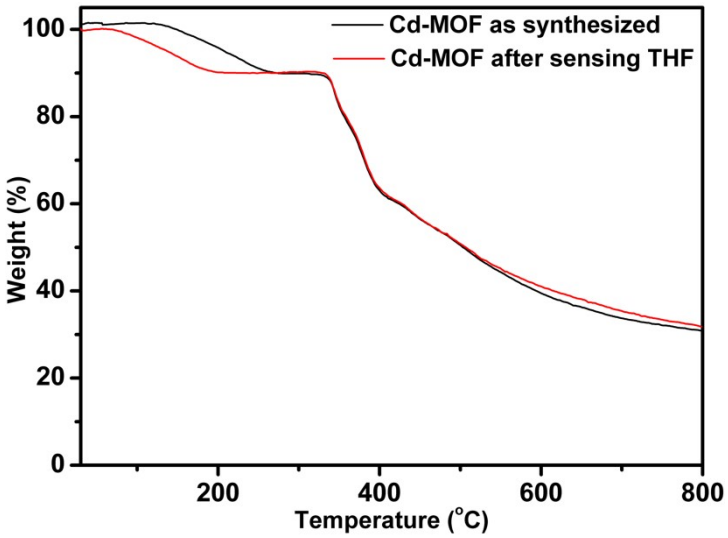

Fig. S11 The TGA curves of Cd-MOF before and after sensing THF.

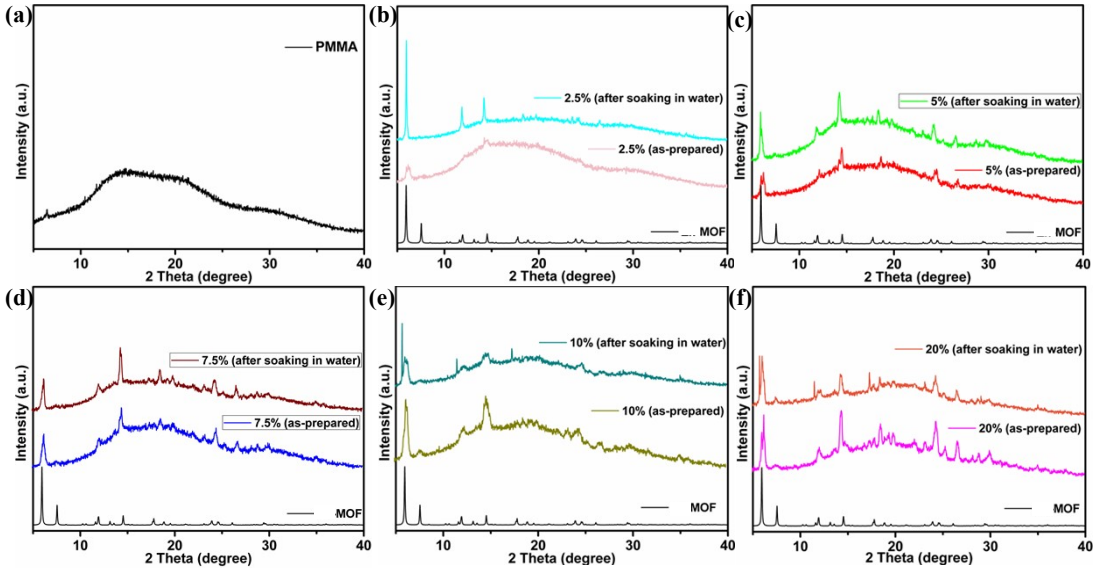

Fig. S12 The PXRD patterns of PMMA (a) and MMMs with different Cd-MOF loading (b-f).

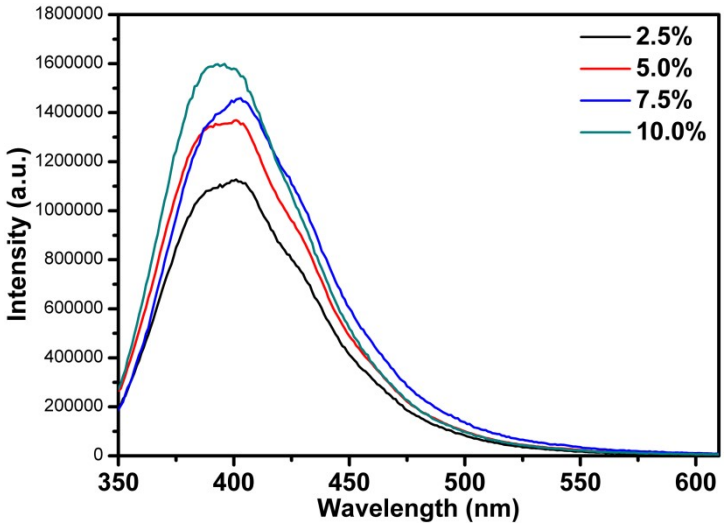

Fig. S13 Luminescence spectra of MMMs after soaked in water.