Supporting Information

Chemical sensors based on ionically conductive metal-organic frameworks for selective cadaverine detection

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Calculation method for the detection limit

The theoretical Limit of Detection (LOD) can be extracted from the linear calibration curve, wherein RMS=root-mean-square deviation.

$$LOD = \frac{3}{slope} \times RMS \ (1)$$

From the test results with low analyte dose, we found that the sensing response has linear relationship with the analyte volume in log scale. Considering the function in log scale, Equation **1** was adjusted to Equation **2**.

$$lgLOD = \frac{3}{slope} lg RMS \ (2)$$

Using the above equation, where RMS=0.044% and slope=1.76, the LOD of the sensor was estimated to be 4.9 nL.

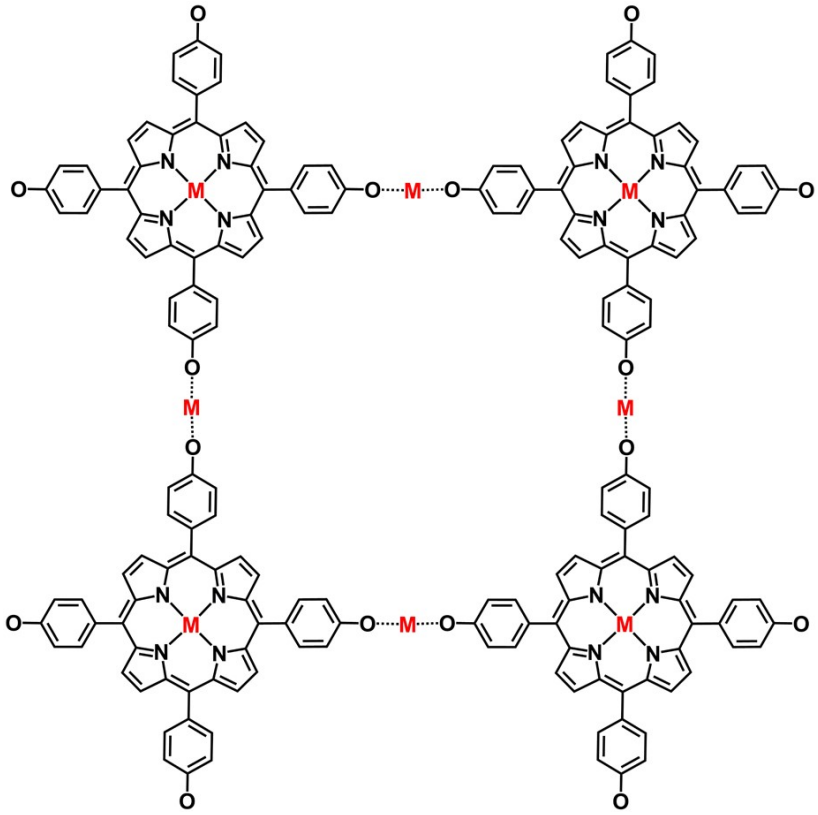

Fig. S1 Chemical structures of IC-MOFs.

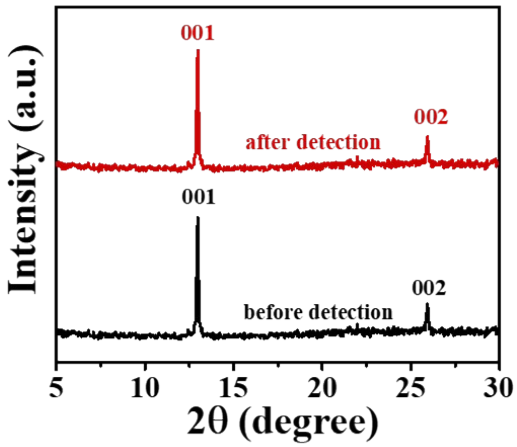

Fig. S2 Out-of-plane XRD patterns of CuTHPP IC-MOF thin films before and after detection of Cad.

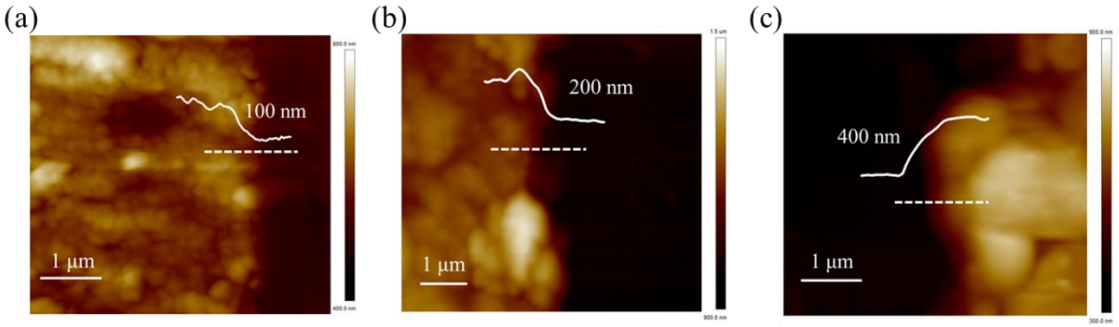

Fig. S3 The AFM images of CuTHPP IC-MOF thin films. (a-c) MOF thin films of different thickness (100, 200, and 400 nm).

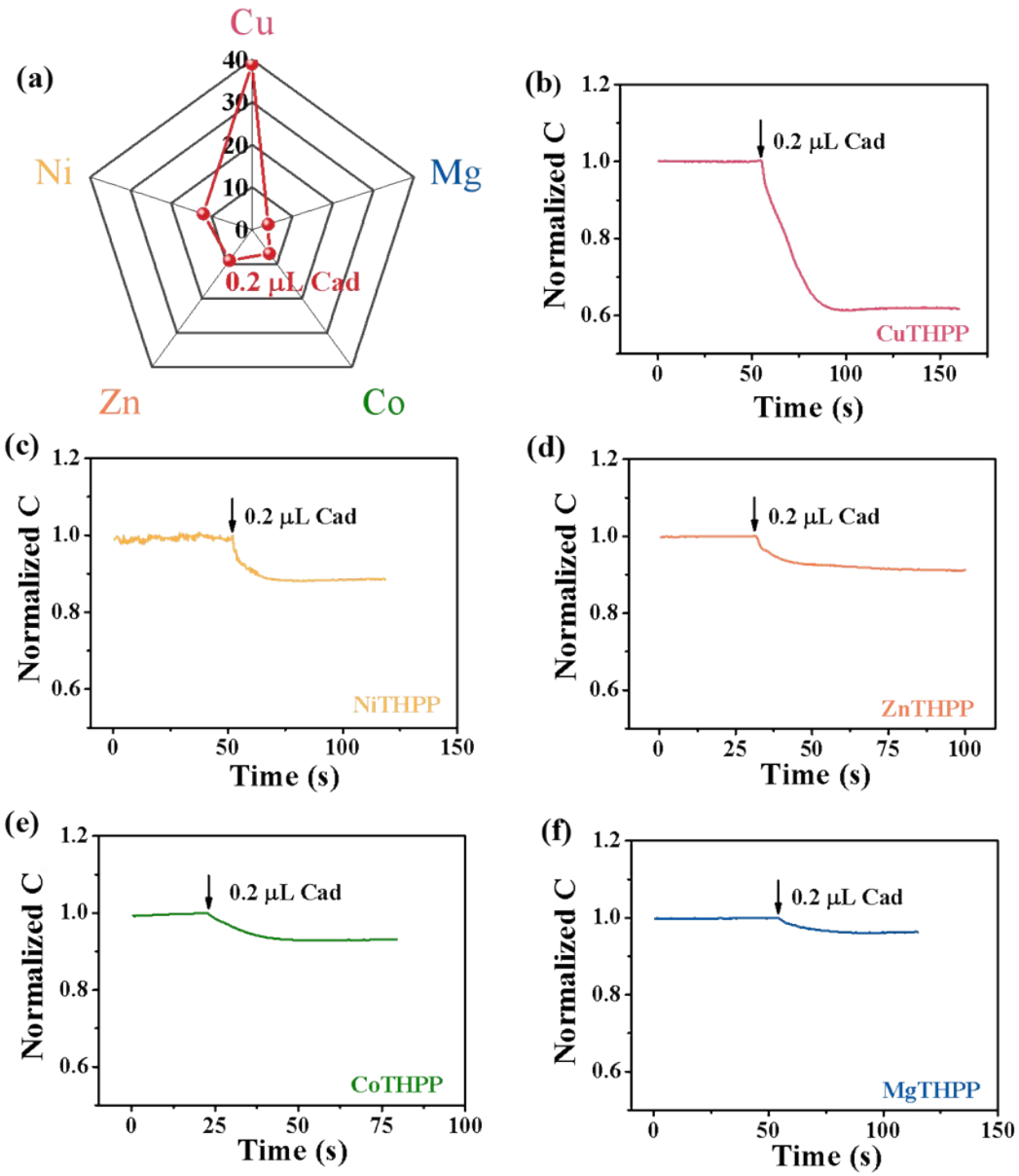

Fig. S4 (a) Capacitance response of IC-MOFs sensors based on different metal ions to Cad of 0.2 μL. (b) Normalized capacitance curve of IC-MOFs sensors based on CuTHPP, (c) NiTHPP, (d) ZnTHPP, (e) CoTHPP, and (f) MgTHPP to Cad of 0.2 μL.

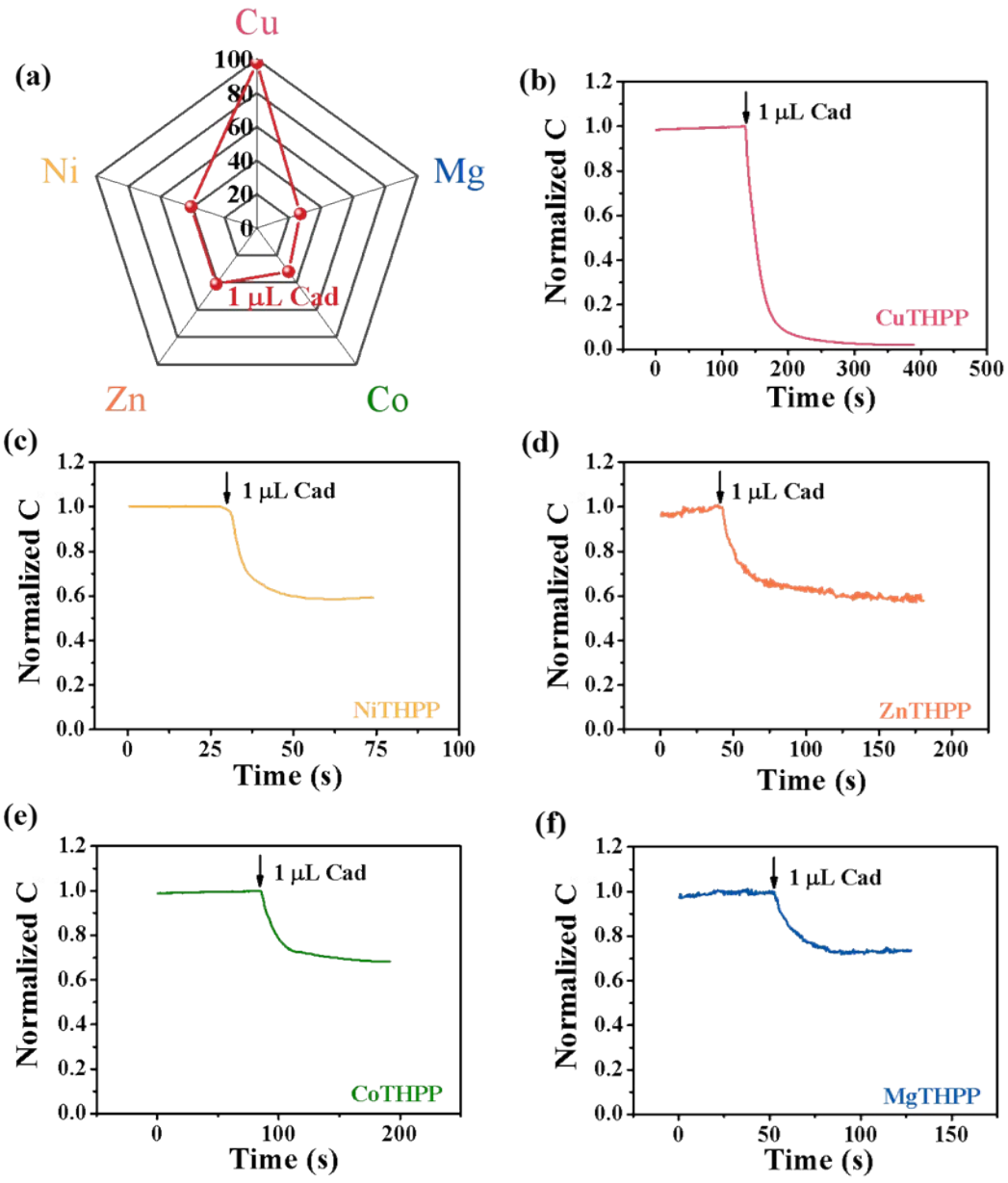

Fig. S5 (a) Capacitance response of IC-MOFs sensors based on different metal ions to Cad of 1 μL. (b) Normalized capacitance curve of IC-MOFs sensors based on CuTHPP, (c) NiTHPP, (d) ZnTHPP, (e) CoTHPP, and (f) MgTHPP to Cad of 1 μL.

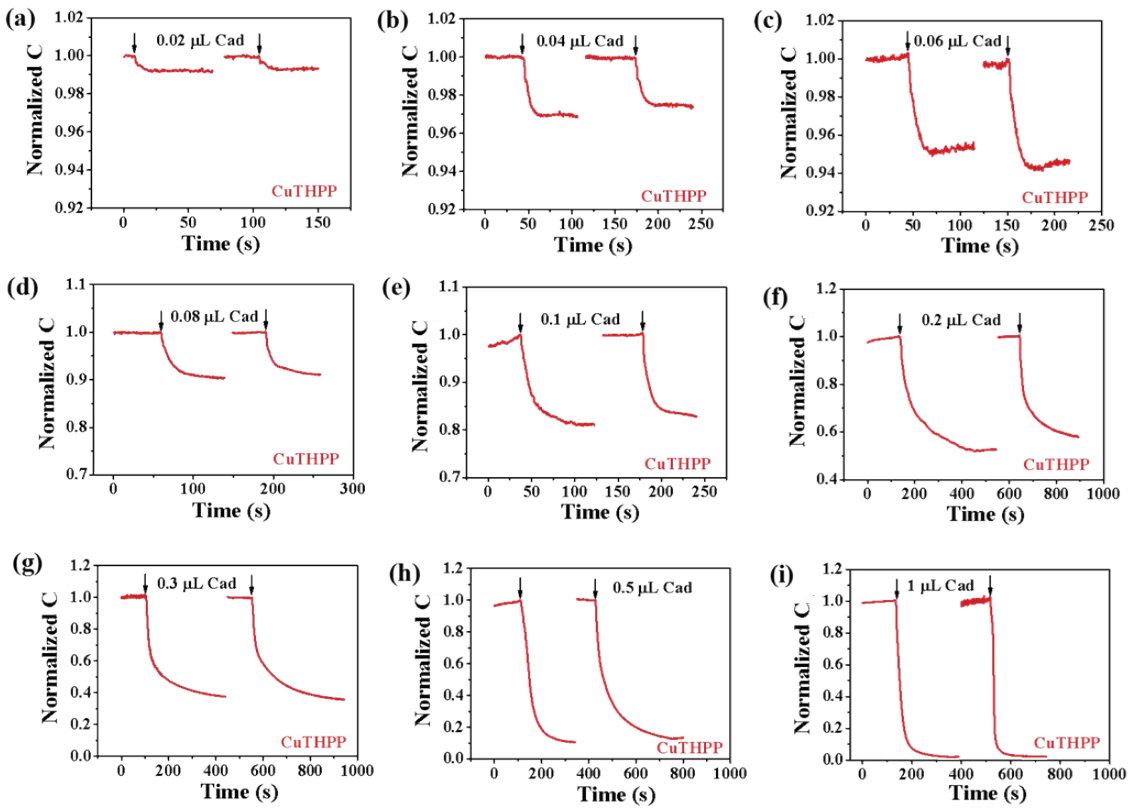

Fig. S6 Normalized capacitance curves of IC-CuTHPP sensors to Cad of (a) 0.02, (b) 0.04, (c) 0.06, (d) 0.08, (e) 0.1, (f) 0.2, (g) 0.3, (h) 0.5, and (i) 1 μL.

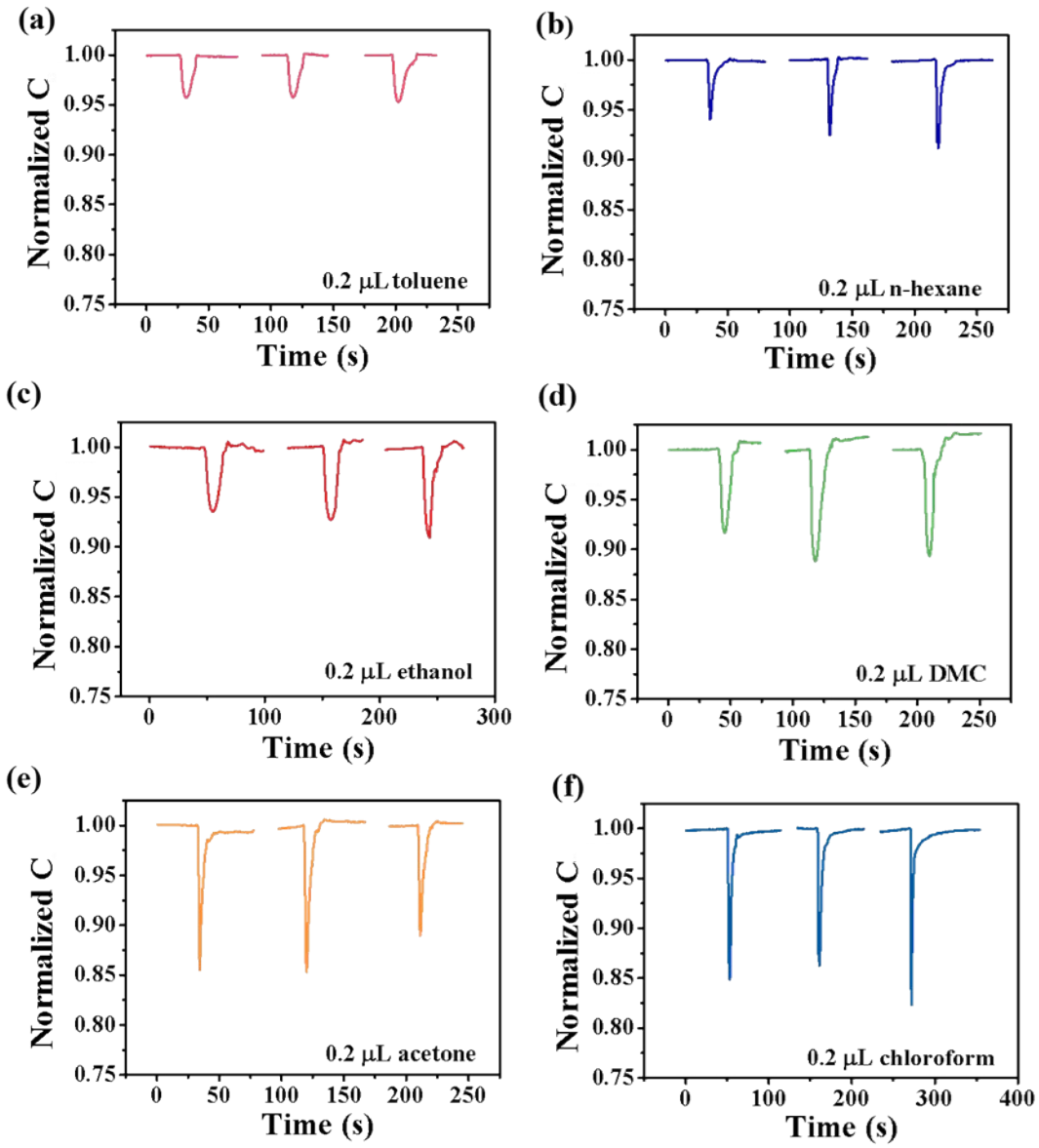

Fig. S7 Normalized capacitance curves of IC-CuTHPP sensors to (a) toluene, (b) n-hexane, (c) ethanol, (d) DMC, (e) acetone, and (f) chloroform of 0.2 μL.