Supporting Information

## Cu MOFs-based catalytic sensing for formaldehyde

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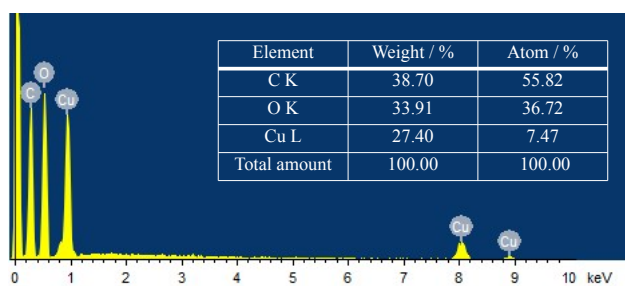**b.** Key Laboratory of Molecular Designing and Green Conversions (Huaqiao University), Fujian Province University, Xiamen 361021, China
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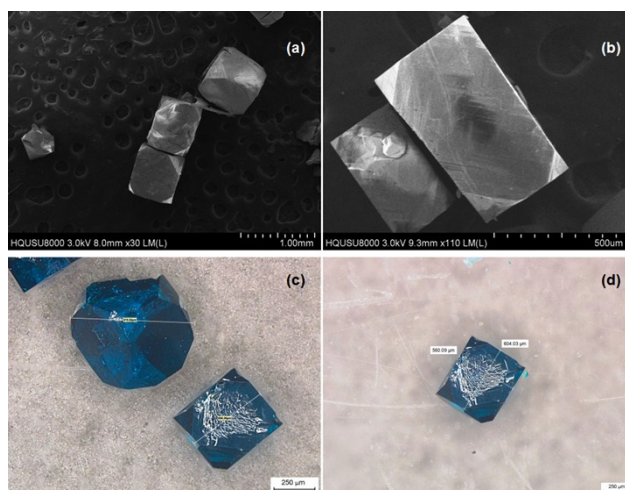
Fig. S1 (a, b) SEM images and (c, d) digital versatile optical microscope images of the as-prepared Cu-BTC MOFs.

| Element	Weight / %	Atom / %
C K	38.70	55.82
O K	33.91	36.72
Cu L	27.40	7.47
Total amount	100.00	100.00

Fig. S2 EDS spectrum of Cu-BTC MOFs. The content of C, O and Cu atoms of the catalyst were 55.82%, 36.72% and 7.47%, respectively.

Table S1. Crystal data and structure refinement of the as-prepared Cu-BTC MOFs.[a]

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Empirical formula	$C_6H_2CuO_5$
Formula weight	217.62
Temperature	293 K
Wavelength	0.71073 A
Crystal system	Cubic
Space group	*Fm-3m*
a (Å)	26.3805(3)
b (Å)	26.3805(3)
c (Å)	26.3805(3)
α (deg)	90
β (deg)	90
γ (deg)	90
Volume (Å^3)	18359.0(6)
Z	48
Absorption coefficient (mm^{-1})	1.415
F(000)	5136
Crystal size (mm)	0.09 x 0.09 x 0.07
Theta range for data collection (^{o})	3.089 to 26.315
Limiting indices	-22<=h<=32, -28<=k<=24, -15<=l<=32,
Reflections collected / unique	13694 / 985 [R_{int} = 0.0362]
Completeness to theta = 26.00 (%)	98.3
Absorption correction	Semi-empirical from equivalents
Max. and min. transmission	1.00000 and 0.42285
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	985 / 0 / 36
Goodness-of-fit on F^2	1.138
Final R indices [I>2sigma(I)]	R_1 = 0.0297, wR_2 = 0.0769
R indices (all data)	R_1 = 0.0369, wR_2 = 0.0818
Largest diff. peak and hole (e Å^{-3})	0.279 and -0.467

[a] The final refinement was performed with a modification of the structure factors for the electron densities of the disordered solvents using the SQUEEZE option of PLATON.
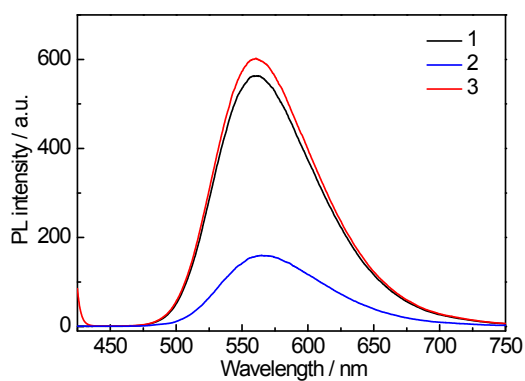
Fig. S3 The comparisons of the PL spectra of the as-prepared Cu-BTC MOFs – OPD solution in the presence (1) and absence (2) of dissolved oxygen, in the absence of room light (3).
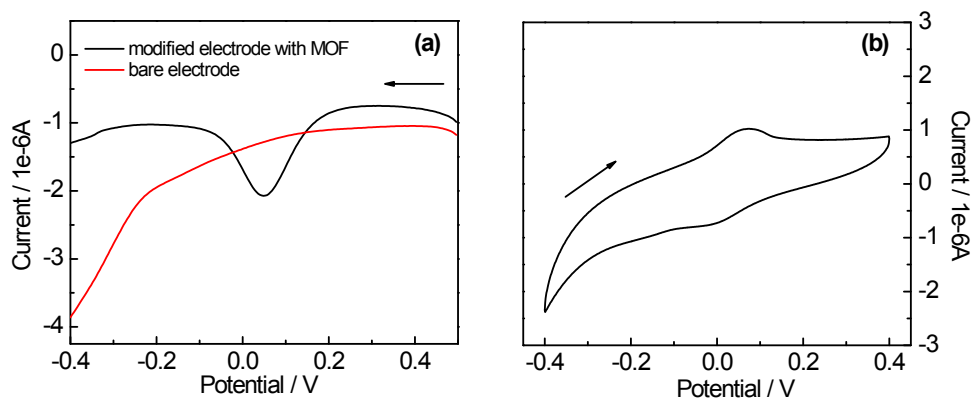

Fig. S4 DPV (a) and CV (b) curves of Cu-BTC MOFs in N_2-saturated 50 mM Tris-HCl buffer solution of pH 7.4 containing 15% acetonitrile (v/v). Scanning rate was 50 mV. S^{-1}.
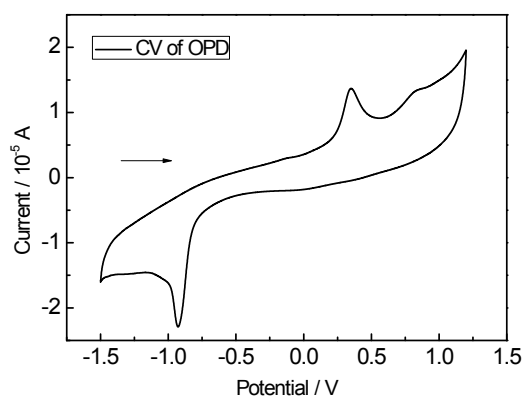
Fig. S5 The CV curve of OPD in N_2-saturated 50 mM Tris-HCl buffer solution of pH 7.4 containing 15% acetonitrile (v/v). Scanning rate was 50 mV. S^{-1}.
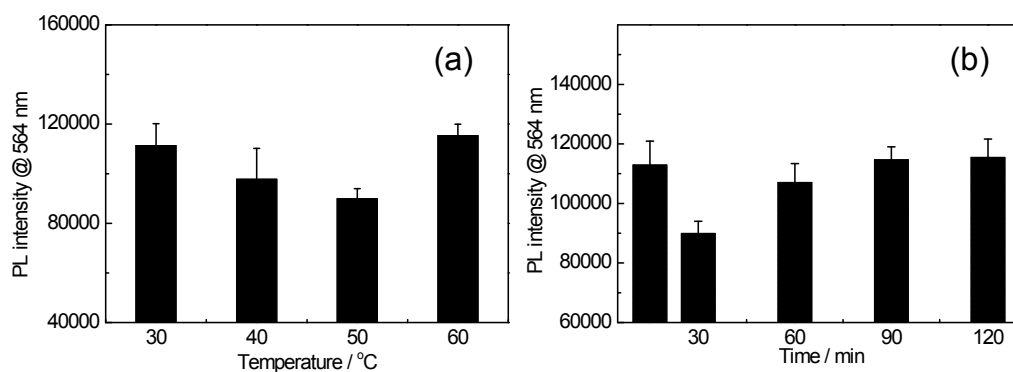
Fig. S6 The PL intensity at 564 nm wavelength of the catalytic fluorogenic reaction system in the presence of gaseous formaldehyde under different the temperature (a), and time (b) of the reaction of OPD and formaldehyde. Experimental conditions: [OPD] = 0.08 mM; the flow rate of formaldehyde gas was fixed as 40 mL·min^{-1}; Cu-BTC MOFs concentration was 0.67 mg·mL^{-1}; 50 mM Tris-HCl buffer solution of pH 7.4 containing 15% acetonitrile content was used.
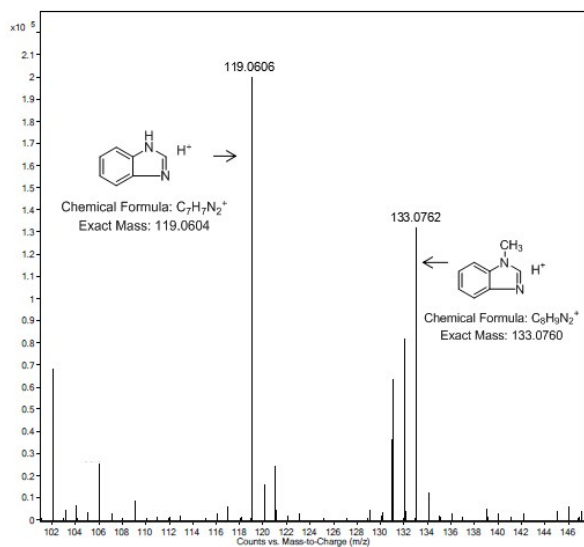
Fig. S7 ESI-MS result of the product of the condensation reaction between OPD and formaldehyde.