

Supplementary Information

Colorimetric detection of Hg²⁺ based on the enhanced oxidase-mimic activity of CuO/Au@Cu₃(BTC)₂ triggered by Hg²⁺

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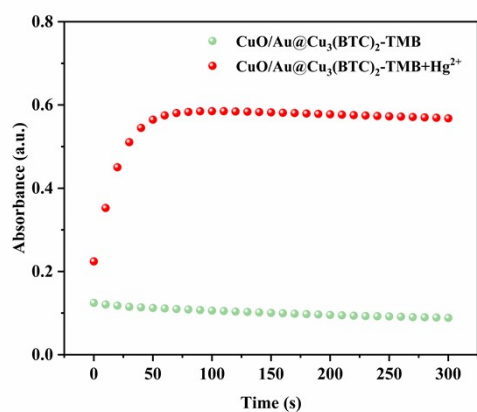


Fig. S1 Time-dependent absorbance changes at 652 nm of CuO/Au@Cu₃(BTC)₂-TMB in the presence and absence of 10 μM Hg²⁺.

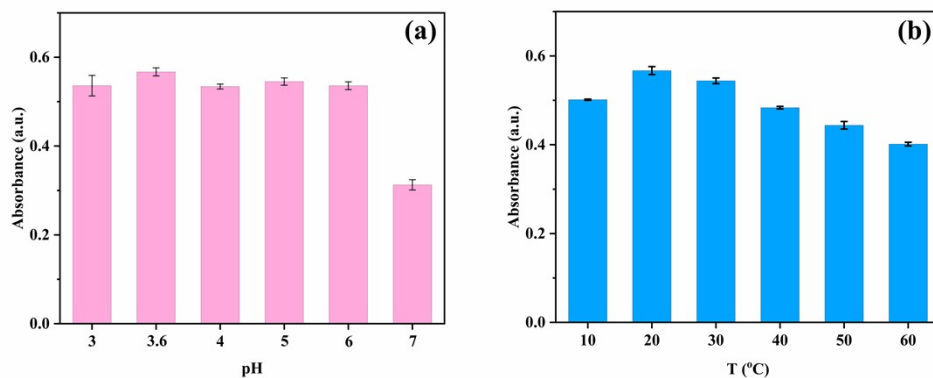


Fig. S2 Influences of (a) pH, and (b) temperature to absorbance at 652 nm of CuO/Au@Cu₃(BTC)₂-Hg²⁺-TMB.

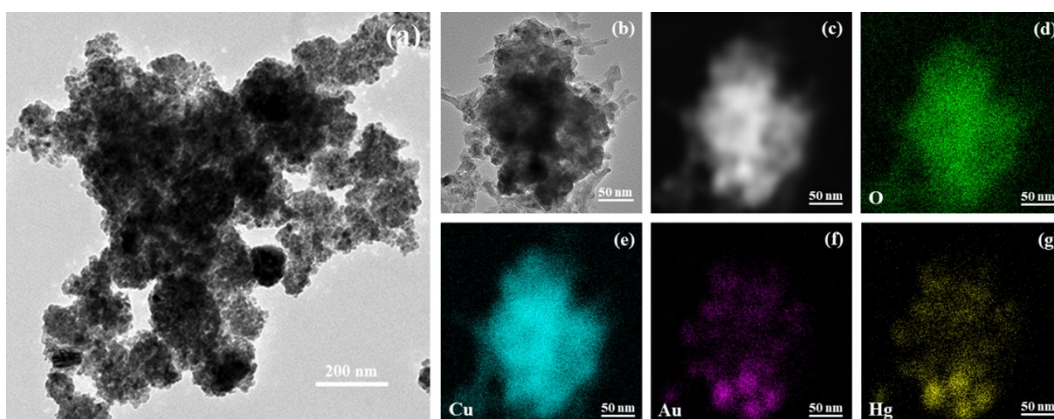


Fig. S3 Morphology characterizations of CuO/Au@Cu₃(BTC)₂ after adding Hg²⁺. (a) TEM images, (b) magnification TEM images, and (c-g) EDX-mapping images.

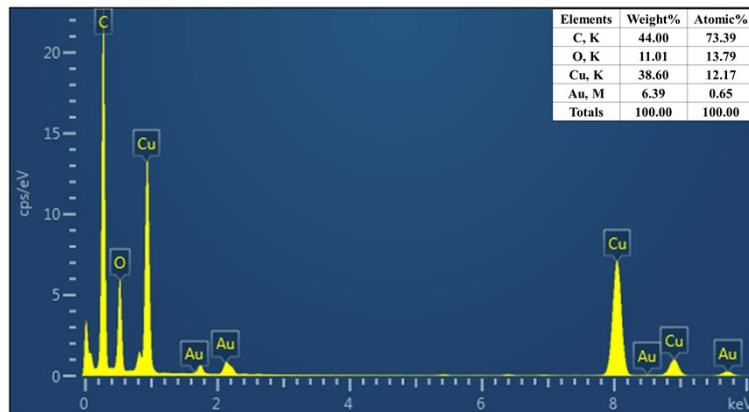


Fig. S4 EDX spectroscopy of CuO/Au@Cu₃(BTC)₂.

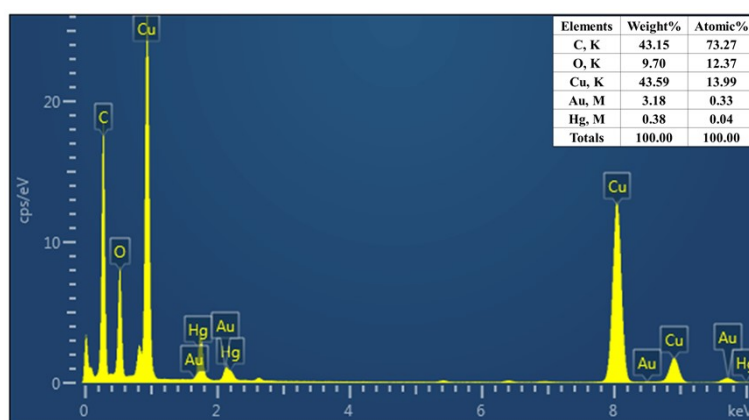


Fig. S5 EDX spectroscopy of CuO/Au@Cu₃(BTC)₂ after adding Hg²⁺.

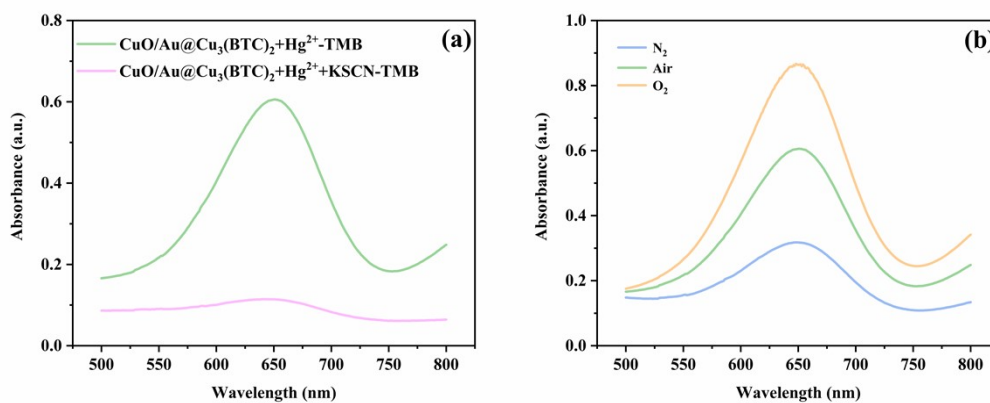


Fig. S6 UV-vis absorbance spectra of CuO/Au@Cu₃(BTC)₂-Hg²⁺-TMB (a) with 50 μ M KSCN, (b) in N₂, air, and O₂.

Table S1 Comparison of kinetics constants of oxidase-like nanozymes

Materials	Km (mM)	Vmax (10 ⁻⁸ M/s)	Reference
Fe-N/S-C	0.45	9.5	1
Cu ₃ /ND@G	2.98	11.5	2
Pt/Co ₃ O ₄	8.77	15.1	3
Co ₄ S ₃ /Co(OH) ₂ HNTs	1.33	46.6	4
Co,N,S co-doped hollow carbon	0.25	41.9	5
Ag ₂ S@graphene oxide	0.10	3.9	6
NiSe ₂	0.36	20.6	7
CuO/Au@Cu ₃ (BTC) ₂	0.74	62.9	This work

Table S2 Comparison of mercury ion detection methods based on nanozymes

Materials	Linear range (μM)	LOD (nM)	Method	Reference
Co,N,S co-doped hollow carbon	1-5, 5-9	90	Colorimetric	5
Ag ₂ S@graphene oxide	0.05-1.2	9.8	Colorimetric	6
	0.01-0.7	5.18	Colorimetric	
NiSe ₂	0-0.7	8.42	Smartphone-based colorimetric sensor	7
Ag nanoparticles	0-600	34.8	Colorimetric	8
Hollow MnFeO	0.1 –15	20	Colorimetric	9
Ag ₃ PO ₄ microcubes	0.1-7.0	20	Colorimetric	10
SnTe/Au	0.2 -58.0	150	Colorimetric	11
CuO/Au@Cu ₃ (BTC) ₂	0.05-25	9.7	Colorimetric	This work

Reference

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