Electronic Supplementary Information

Tailoring metal sites of FeCo-MOF nanozymes for significantly enhanced peroxidase-like activity

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Supplementary results

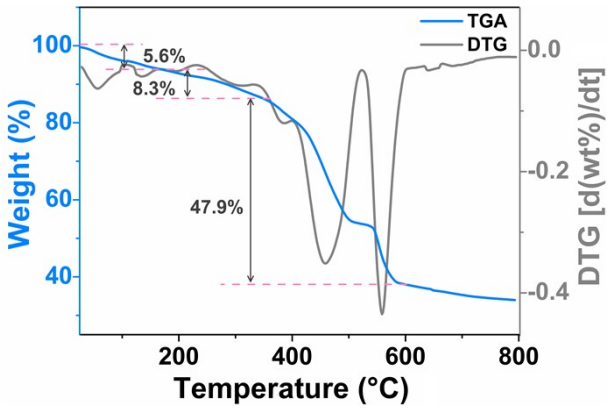

Fig. S1 TGA and DTG curves of FeCo-MOF.

FeCo-MOF presented three obvious weight loss procedures, corresponding to the evaporation of the adsorbed-water or solvent in the pores and the surface of FeCo-MOF below 150 °C, the elimination of anion ligands (OH^-, and Cl^-) in the range of 150-350 °C, and the decomposition of thermally stable coordinated ligands between 350 °C to 600 °C.

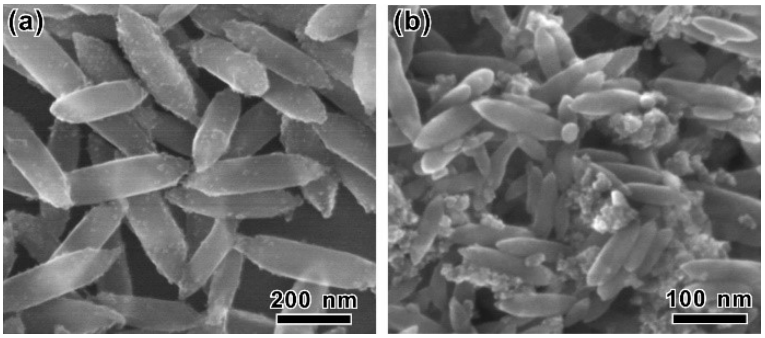

Fig. S2 SEM images of (a) Fe-MOF and (b) FeCo-MOF.

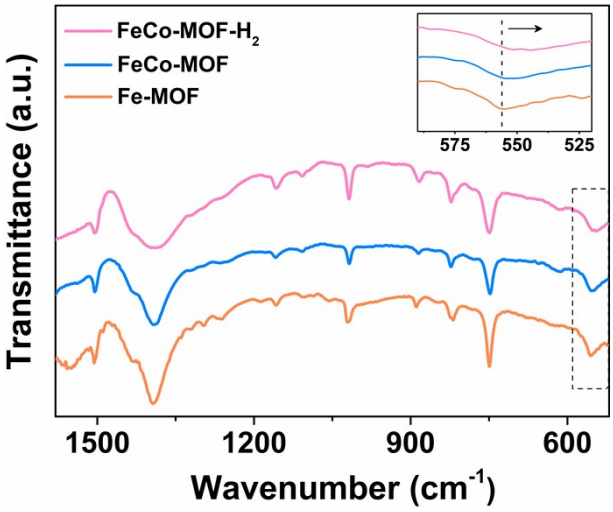

Fig. S3 FT-IR spectra of Fe-MOF, FeCo-MOF, and FeCo-MOF-H_2. Inset: enlarged view in the wavelength range of 590 ~ 520 cm^{-1}.

The peak at 556 cm^{-1} in Fe-MOF was assigned as the characteristic stretching vibration peak of Fe–O_{linker}. The metal-O_{linker} peak in FeCo-MOF and FeCo-MOF-H_2 was located at 553 cm^{-1} and 551 cm^{-1}, respectively.

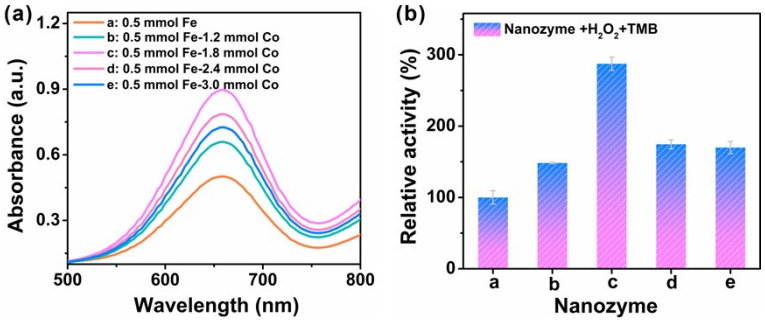

Fig. S4 (a) The absorption spectra of H_2O_2 + TMB + FeCo-MOF-H_2 prepared via low-temperature heat treatment on FeCo-MOF with different ratio of Fe and Co. (b) Corresponding comparison of peroxidase-like activities of these nanozymes.

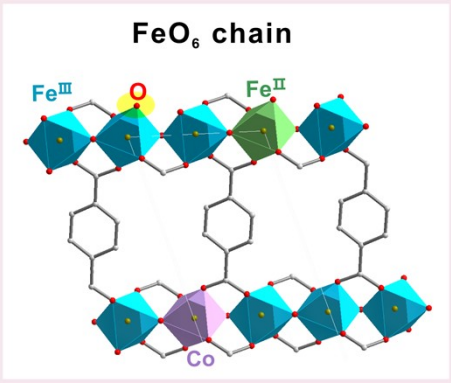

Fig. S5 The FeO_6 chains in FeCo-MOF-H_2 nanozymes.

Table S1 Performance comparisons of different nanozymes in H_2O_2 detection.

Nanozyme	Linear range (μM)	LOD (μM)	Response time (min)	Ref.
Fe-MOFs	1.2–100	1.2	60	[1]
MIL-88B-Fe	10–100	0.6	50	[2]
Fe-MIL-88A	2–20.3	0.56	30	[3]
Pt/Fe-MOF	20–600	13.01	10	[4]
MOF(Co/2Fe)	10–100	5	–	[5]
Fe_3O_4@MIL-100(Fe)	2-60/60-160	0.63	19	[6]
Fe@PCN-224 NPs	2–100	1.60	10	[7]
Fe_3O_4 NPs	5–100	3	10	[8]
Si-CoO	2−10	4.32	3	[9]
Au/Co_3O_4-CeO_x NCs	10–100	5.29	3	[10]
$Ni_{0.67}Co_{0.33}$ LDH	10–200	0.48	-	[11]
Fe SACs	0.1–100	0.03	5	[12]
FeCo-MOF-H_2	10–50	0.29	15	This work

Table S2 Performance comparisons of different nanozymes in GSH detection.

Nanozyme	Linear range (μM)	LOD (μM)	Ref.
Fe-MIL-88NH_2	1–100	0.45	[13]
Fe_3O_4@MIL-100(Fe)	1–45	0.26	[6]
NCDs/UiO-66	–15	0.48	[14]
PSMOF	–20	0.68	[15]
Cu-MOF-NO_2	–100	0.97	[16]
Fe_3O_4 MNPs	3–30	3	[17]
Fe_3O_4/CNDs	0.1–20	0.58	[18]
Co_3O_4	–40	0.5	[19]
Si-CoO	1–5	0.45	[9]
Co_3O_4-MMT NCs	0.1–20	0.088	[20]
Por-$ZnFe_2O_4$/rGO	2–40	0.76	[21]
MoS_2@$CoFe_2O4$	0.5–35	0.21	[22]
Fe-N-C	0.67–33	0.71	[23]
FeCo-MOF-H_2	2–300	0.50	This work

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