Supplementary information

Hierarchical Microtubes Constructed by Fe-doped MoS$_2$ nanosheets for Biosensing Application

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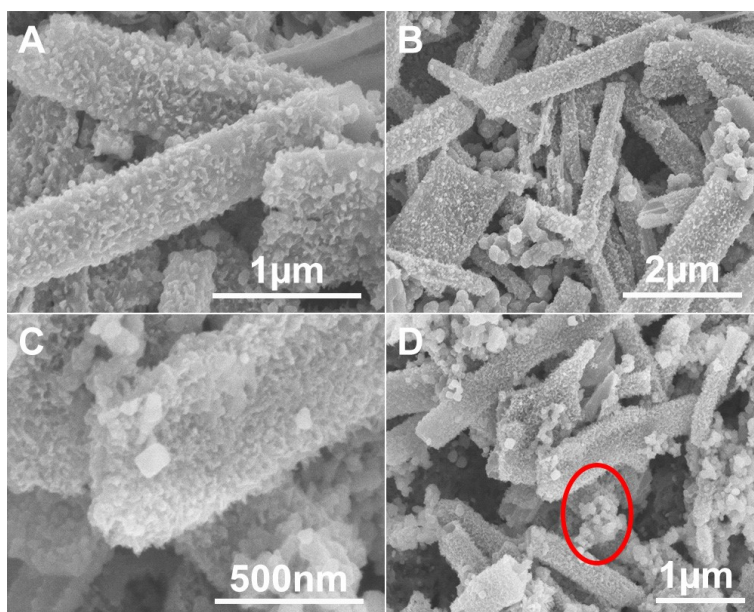
Fig. S1 SEM images of as-synthesized products with different mass ratios of MoO_3@FeOOH to ammonium tetrathiomolybdate. (a) 60 mg : 10 mg ; (b) 60 mg : 30 mg
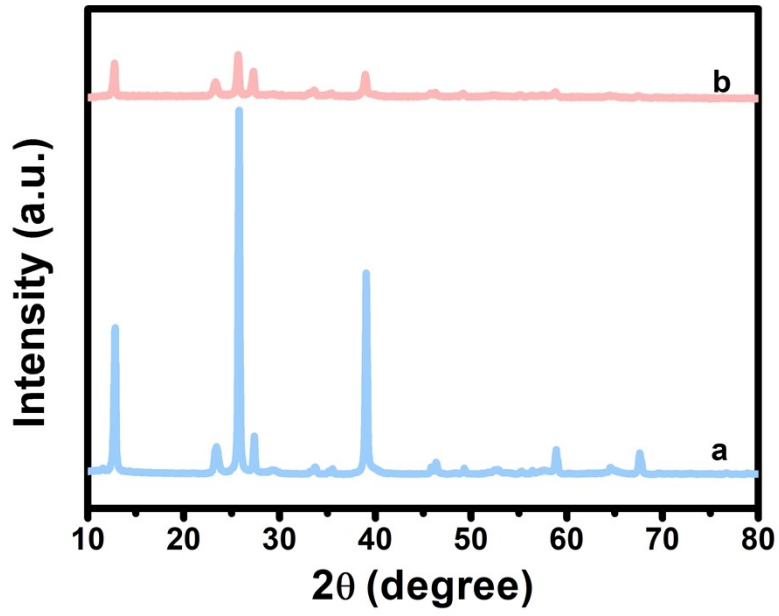
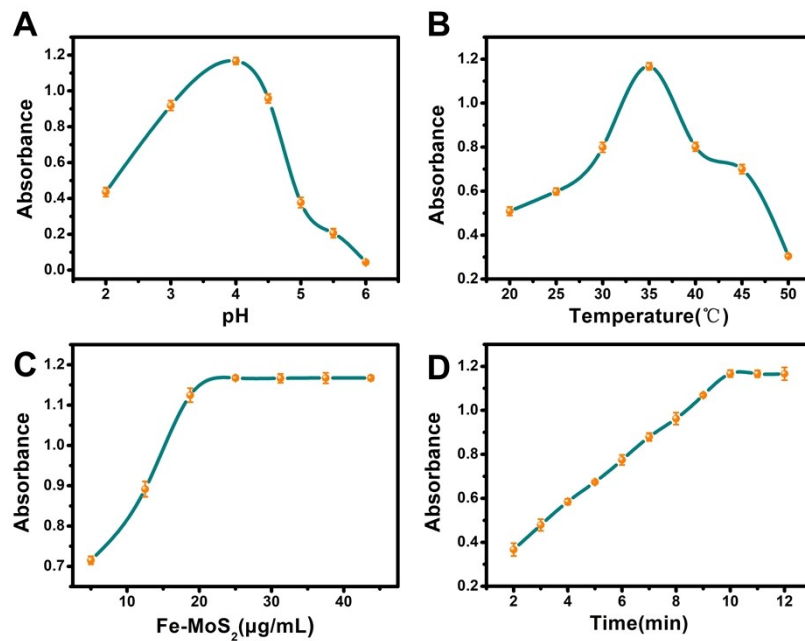Fig. S2 X-ray diffraction patterns of MoO_3(a) and MoO_3@FeOOH(b).

Fig. S3. (A) The pH dependence of the peroxidase-like activity. (B) The temperature (20 °C-50 °C) is dependent on the peroxidase-like activity. (C) The material concentration (5-45 µg/mL) depends on the peroxidase-like activity. (D) The reaction time (2 min-12 min) is dependent on the peroxidase-like activity. The error bars shown represent the standard error derived from three repeated measurements.

Table S1 The apparent kinetic parameters (Km and Vmax) of Fe-MoS$_2$ catalysts were compared with other simulated enzymes.

Enzyme mimics	K_m (mM)		V_{max} (10^{-8} Ms^{-1})		Ref
	TMB	H$_2$O$_2$	TMB	H$_2$O$_2$	
Fe-MoS$_2$	0.0164	0.046	9.44	4.97	This work
HRP	0.434	3.7	10	8.71	[1]
Fe$_3$O$_4$ nanoparticles	0.098	3.44	154	9.78	[2]
MoS$_2$	2.668	1.809	1.501	1.642	[3]
Fe$_3$O$_4$/MoS$_2$	0.806	0.238	141.3	37.8	[4]
MoS$_2$-Pt$_{74}$Ag$_{26}$	0.386	25.71	3.22	7.29	[5]
MoS$_2$-PPy-Pd	0.93	6.4	_	_	[6]
Fe-MoS$_2$	0.387	0.0638	950	438.5	[7]

Table S2 Comparison of analysis from various reports with different chosen materials and their respective LOD, and linear range values toward the detection of GSH

Material	Detection method	LR(µM)	LOD(µM)	Ref
Fe-MoS$_2$	Colorimetric	1-30	0.577	[7]
MoS$_2$ QDs/MnO$_2$	Colorimetric	2.0-300.0	0.5	[8]
EDC/CQDs	Colorimetric	1.0-50.0	0.943	[9]
SWNTs/GCE	Electrochemical	1.0-500	0.5	[10]
AgNPs(TMSPED)-rGO	Electrochemical	0.1-2.75	0.28	[11]
MWNTs/CoQ10/IL	Electrochemical	0.2-4	0.32	[12]

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