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Supporting Information

PEGylated molybdenum dichalcogenides (PEG-MoS_2) nanosheets with enhanced peroxidase-like activity for colorimetric detection of H_2O_2

Huimin Zhao*[a], Yaxi Li,[a] Bing Tan,[a] Yaobin Zhang,[a] Xiaochi Chen*[a,b], Xie Quan[a]

[a] Key Laboratory of Industrial Ecology and Environment Engineering (Ministry of Education, China), School of Environmental Science and Technology, Dalian University of Technology, Linggong Road 2, Dalian 116024, PR China

E-mail: zhaohuim@dlut.edu.cn (H. Zhao); Tel: 0411-84706263

[b] Department of Urology, The First Affiliated Hospital of Dalian Medical University, Zhongshan Rord 222, Dalian 116027, PR China

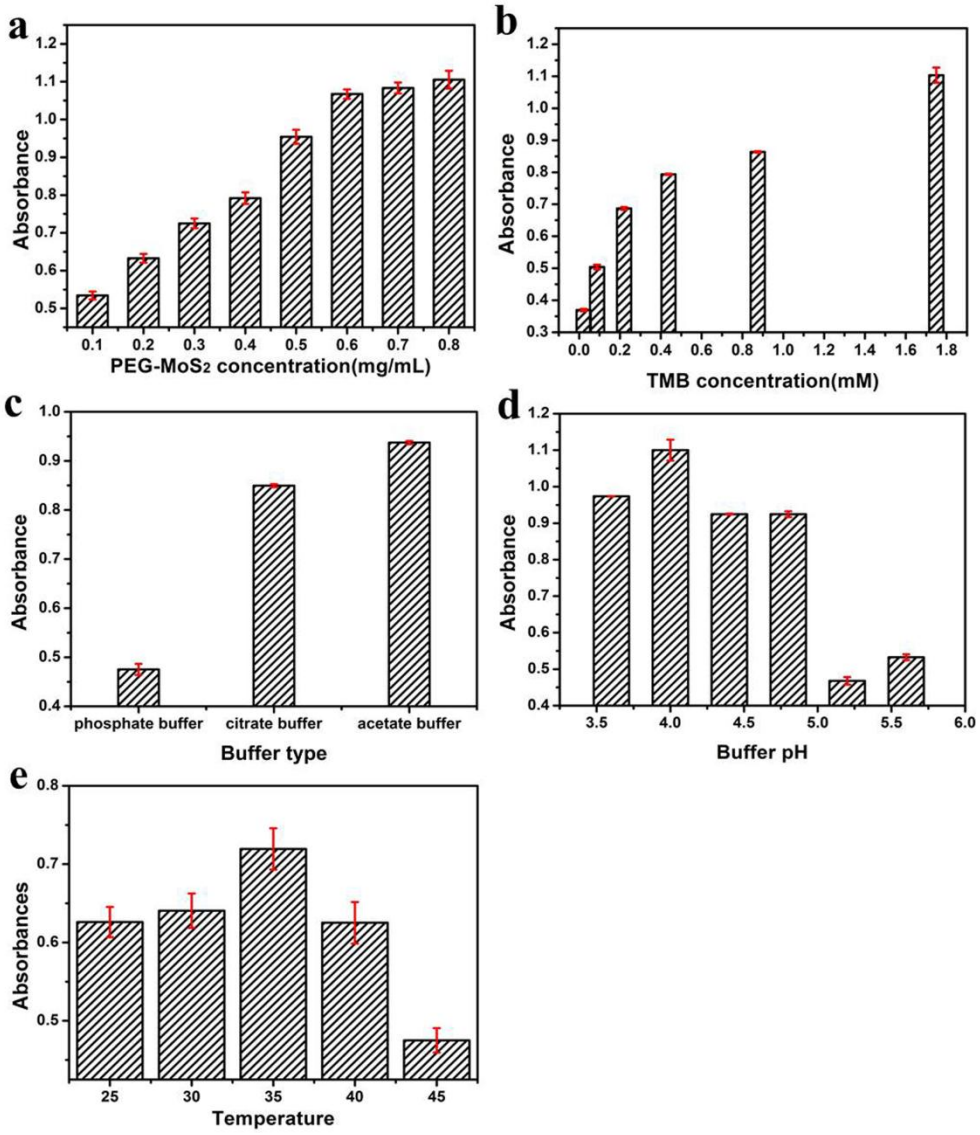

Fig. S1 The optimum conditions in the detection of H_2O_2. (a) the optimum concentration of PEG-MoS_2 nanosheets, (b) the optimum TMB concentration, (c) the optimum buffer type, (d) the optimum pH value of the buffer, and (e) the optimum reaction temperature.

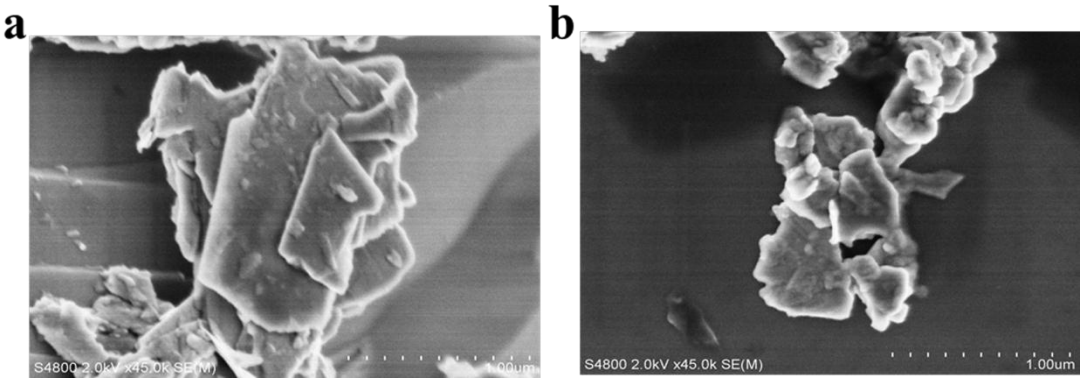

Fig. S2 SEM images of MoS_2 (a) and PEG-MoS_2 (b) nanosheets.

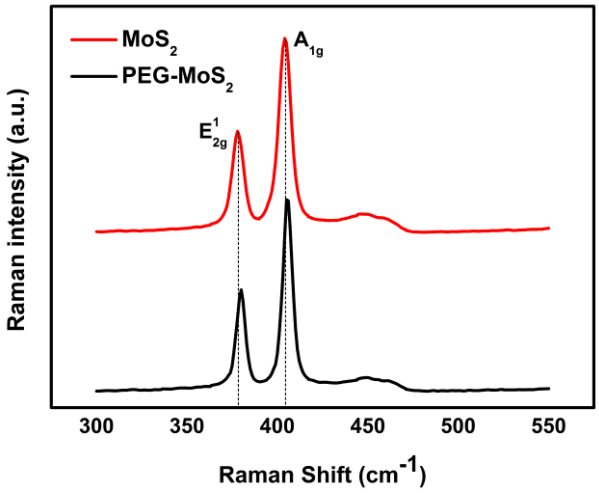

Fig. S3 Raman spectra of MoS_2 (a) and PEG-MoS_2 (b) nanosheets.

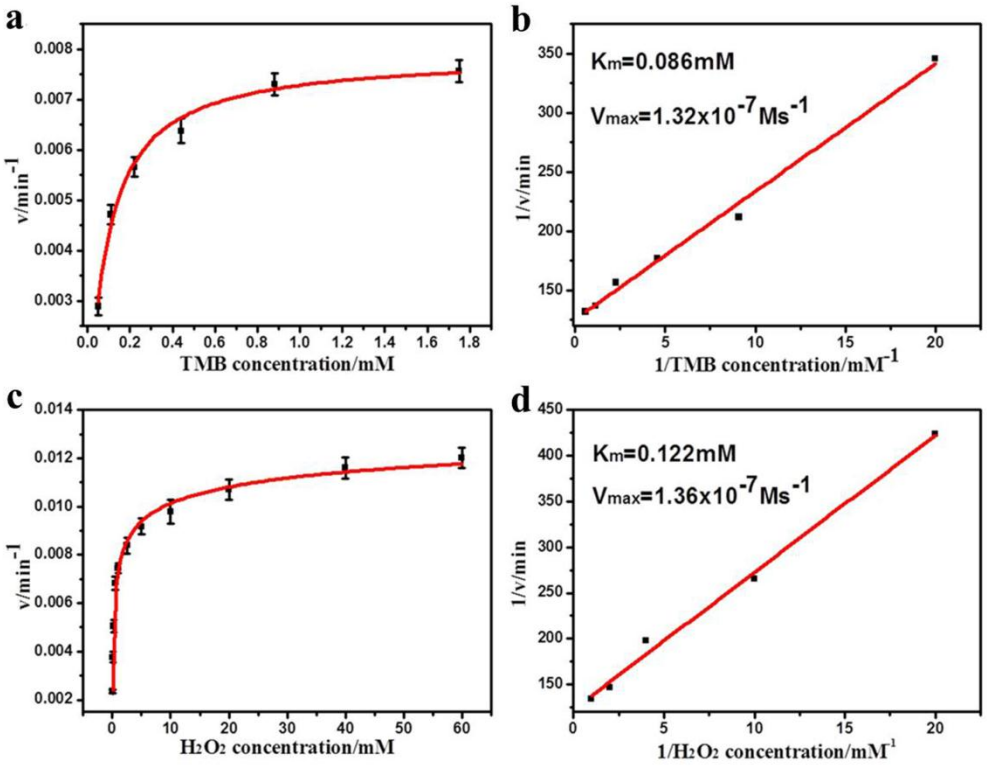

Fig. S4 Kinetic analysis of MoS_2 nanosheets by double reciprocal plots with substrate of TMB and H_2O_2.

Table S1.

The comparation of kinetic parameters of enzyme mimic based MoS_2.

Catalyst	Substrate	K_m / mM	V_{max} / 10^{-7}Ms^{-1}	Reference
MoS_2 Nanosheets	TMB	0.525	0.516	1
	H_2O_2	0.0116	0.429	
MoS_2 NPs	TMB	4.55	0.362	2
	H_2O_2	0.019	0.0224	
SDS-MoS_2 NPs	TMB	2.04	0.16	2
	H_2O_2	0.013	0.0193	
MoS_2–$Pt_{74}Ag_{26}$	TMB	25.71	0.729	3
	H_2O_2	0.386	0.322	
PVP-MoS_2 NPs	TMB	0.232	0.456	4
	H_2O_2	0.366	0.476	
PEG-MoS_2 Nanosheets	TMB	0.047	1.78	This work
	H_2O_2	0.108	1.06	

Table S2.

The comparation of available methods for H_2O_2 colorimetric detection based on enzyme mimic of inorganic graphene analogs.

Enzyme mimic	Chromogenic substrate	H_2O_2 detection		Reference
		Ranges (μM)	LODs (μM)	
MoS_2 Nanosheets	TMB	5-100	1.5	1
SDS-MoS_2 NPs	TMB	2-100	0.32	2
MoS_2–$Pt_{74}Ag_{26}$	TMB	1-50	0.4	3
PVP-MoS_2 NPs	TMB	2-150	1.3	4
Graphene oxide	TMB	0.05-1.0	0.05	5
Graphene oxide-Fe_3O_4	TMB	0.5-30	0.086	6
GO-COOH	TMB	$0.05x10^{-5}$-$1x10^{-3}$	0.05	7
PtPdNDs/GNs	TMB	0.0005-0.15	0.1	8
PEG-MoS_2 Nanosheets	TMB	2.86-286	1.18	This work

Reference

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